



Study to analyse lubricant and industrial oil EPR systems and waste oil collection schemes in EU Member States to support measures to increase collection rates

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ABSTRACT

English

This study commissioned by the European Commission's Directorate-General for the Environment aims to support the assessment of options for the potential revision of the Waste Framework Directive, in particular regarding measures to increase waste oil collection and to the operation of Extended Producer Responsibility (EPR) systems for industrial and lubricating oils and associated collection schemes.

There is no clear conclusion as to whether an EPR or other collection scheme is necessary to ensure high collection rates. The necessary conditions for good collection performances are the same with or without an EPR/collection scheme. The characteristics of the financial support scheme appear to have more influence on collection rates than having an EPR scheme in place or not. If the collection price is not a sufficient incentive, illegal management must be disincentivised. The main factor affecting the quality of the collected waste oil appears to be the existence of a price incentive to ensure quality.

At EU-level, collection targets that increase with time should be set. This report presents policy measures at Member State level that on their own or in combination can result in increased collection rates. Waste oil quality should be improved to avoid contamination leading to hazardous waste incineration via policy measures at Member State level.

French

Cette étude commanditée par la Direction générale de l'environnement de la Commission européenne vise à soutenir l'évaluation des options pour la révision potentielle de la Directive-cadre sur les déchets, en particulier en ce qui concerne les mesures visant à accroître la collecte des huiles usagées et le fonctionnement des systèmes de responsabilité élargie des producteurs (REP) pour les huiles industrielles et lubrifiantes et les systèmes de collecte associés.

Il n'y a pas de conclusion claire quant à la nécessité d'une REP ou d'un autre système de collecte pour garantir des taux de collecte élevés. Les conditions nécessaires à de bonnes performances de collecte sont les mêmes avec ou sans REP/système de collecte. Les caractéristiques du système de soutien financier semblent avoir plus d'influence sur les taux de collecte que la mise en place ou non d'une REP. Si le prix de la collecte n'est pas une incitation suffisante, il faut dissuader la gestion illégale. Le principal facteur influant sur la qualité des huiles usagées collectées semble être l'existence d'un incitant prix à la qualité.

Au niveau de l'UE, il convient de fixer des objectifs de collecte qui augmentent avec le temps. Ce rapport présente les mesures politiques prises au niveau des États membres qui, seules ou combinées, peuvent entraîner une augmentation des taux de collecte. La qualité des huiles usagées devrait être améliorée afin d'éviter toute contamination conduisant à l'incinération de déchets dangereux, par le biais de mesures politiques au niveau des États membres.

TABLE OF CONTENTS

ABSTRACT	5
EXECUTIVE SUMMARY	7
1. INTRODUCTION	18
2. TASK 1: ANALYSIS OF LUBRICANT AND INDUSTRIAL OIL EPR SYSTEMS AND WASTE OIL COLLECTION SCHEMES	20
2.1. Overview of the situation in EU Member States	21
2.2. In-depth assessment of 10 selected Member States and analysis of 3 non-EU countries	24
2.3. Summary of stakeholder consultation	25
2.3.1. Summary of waste oil-relevant elements of the Call for Evidence on the revision of the Waste Framework Directive (WFD)	25
2.3.2. Questionnaires and bilateral meetings	26
2.4. Problem definition	28
2.4.1. Introduction to the problem	28
2.4.2. Problem drivers	35
2.4.3. Expected evolution of the problem without new intervention	58
2.5. Best policy practices	59
2.5.1. Overview	59
2.5.2. Collection rates	60
2.5.3. Quality	73
3. TASK 2: OPTIONS TO INCREASE COLLECTION – FOCUS ON EPR AND COLLECTION SCHEMES	79
3.1. Screening of the policy measures	79
3.2. Final list of measures	88
3.3. Baseline	89
3.4. Quantitative assessment of EU-level policy measures	92
3.4.1. Measure 1: Collection targets that increase with time	92
3.5. Qualitative assessment of MS-level policy measures	102
3.5.1. Measure 2: Subsidy for small waste holders	102
3.5.2. Measure 3: Prohibition to financially charge waste holders for collection	104
3.5.3. Measure 4: Obligation for collectors to provide collection service	106
3.5.4. Measure 5: Small waste holders are allowed to go to municipal recycling station (civic amenity site)	108
3.5.5. Measure 6: Specific criteria to license collectors for waste oil collection	111
3.5.6. Measure 7: Mandatory quality control by waste collectors	113
3.5.7. Measure 8: Ensure separate collection of waste streams contaminating waste oils (vegetable and cooking oil and brake fluids)	115

3.5.8.	Measure 9: Waste holder that contaminated the waste oil must pay for the full induced cost of treatment	117
3.5.9.	Measure 10: Establish guidelines that clarify the waste oils that should be kept segregated by the waste holder/collector	119
3.5.10.	Summary of the qualitative assessment of MS-level policy measures	122
4.	TASK 3: OIL DATA STATISTICAL ANALYSIS AND SUPPORT TO POSSIBLY REVIEW THE WFD	125
4.1.	Lubricants Placed on the Market (PoM)	126
4.2.	Collection of waste oil	129
4.3.	Treatment	132
5.	TASK 4: WORKSHOP ON WASTE OILS EPR	136
6.	CONCLUSIONS	138
7.	RECOMMENDATIONS	140
8.	APPENDICES	142
8.1.	Compiled Member States questionnaires	142
8.2.	In-depth assessment of 10 selected Member States	142
8.2.1.	Belgium	144
8.2.2.	Croatia	156
8.2.3.	Estonia	166
8.2.4.	Finland	174
8.2.5.	France	181
8.2.6.	Germany	194
8.2.7.	Hungary	202
8.2.8.	Poland	210
8.2.9.	Portugal	219
8.2.10.	Spain	229
8.3.	Non-EU countries	240
8.3.1.	Australia	240
8.3.2.	USA	246
8.3.3.	Turkey	250
8.4.	Stakeholder questionnaires	256
8.5.	Workshop detail (summary of SliDo inputs)	257
8.5.1.	Problem definition – Causes of waste oils collection and regeneration problems	257
8.5.2.	Policy measures – Increasing the quantity and the quality of waste oil treated	258
8.5.3.	General comments from participants	261
8.5.4.	Good practices	261
8.6.	Data sources for baseline estimates	262
8.7.	Collection cost model	263
8.7.1.	Transport cost for collected waste oil	263

Final Report

8.7.2.	Storage facility	266
8.7.3.	Analysis and quality control	266
8.7.4.	Data sources and estimation approaches	267
8.7.5.	Estimates for cost parameters per MS	269
8.7.6.	Collection cost estimates per country	277
8.7.7.	Population density correction	278
8.8.	Data for collection targets impact assessment	280
8.9.	Statistics on quantities placed on the market per waste oil category	286
8.10.	Statistics on type of treatment of waste oil per process	287
8.11.	Environmental impact assessment (transport)	288

EXECUTIVE SUMMARY

English

This study commissioned by the European Commission's Directorate-General for the Environment aims to support the assessment of options for the potential revision of the Waste Framework Directive, in particular regarding measures to increase waste oil collection and to the operation of Extended Producer Responsibility (EPR) systems for industrial and lubricating oils and associated collection schemes.

The study is based on a literature review and consultation of stakeholders and experts at EU and national levels. It provides evidence on existing performance; seeks opinions and insights about the problem, the feasibility and possible impacts (economic, social and environmental) of possible measures; gathers examples of best practices and views on the subsidiarity of possible measures. The analysis of policies to further promote waste oil regeneration are not in the scope of this study (as they are being assessed separately in a study by the JRC). However, this study does analyse interactions between collection and treatment,

Not enough waste oils are collected separately in the EU

The Waste Framework Directive (article 21) clearly states that waste oils must be separately collected and not mixed with waste oils of different characteristics. As waste oils are hazardous waste, Member States must ensure that their generation, collection, transport and treatment is monitored and subject to specific operating conditions and reporting requirements (articles 17, 18, 19, 25, 34, 35 of the Waste Framework Directive).

Despite these rules, the 2020 report of the Commission "Study to support the Commission in gathering structured information and defining of reporting obligations on waste oils and other hazardous waste"³ estimates that avoidable losses of waste oils amount to approximately 18% of collectable waste oils in the EU in 2017 (0.36 million tonnes not being collected officially, out of 2 million tonnes of collectable waste oils), meaning that 82% of what can theoretically be collected is effectively separately collected (or at least reported as such).

Collected waste oils are not sufficiently sent to regeneration

In general, the Waste Framework Directive (WFD) establishes a waste hierarchy that is of general application and sets a preference for waste prevention over preparing for reuse and recycling, followed by recovery and disposal. In particular, for waste oils, article 21 indicates a priority for regeneration (used here as a synonym of 'recycling') over combustion for energy recovery. The Member States that have specific requirements for regeneration may ban exports for incineration or co-incineration, provided they comply with Regulation (EC) No 1013/2006 on waste shipments.

Despite these measures, on average, only 61% of waste oils collected separately via legal management routes is regenerated.

Conclusions

There is no clear conclusion as to whether an EPR or other collection scheme (e.g. deposit-refund scheme) is necessary to ensure high collection rates.

The necessary conditions for good collection performance are the same with or without having an EPR/collection scheme in place.

Some Member States have neither an EPR scheme nor a specific collection scheme in place but perform well (e.g. Germany, Austria). In contrast, other countries have a long-standing EPR scheme in place and show low performances (e.g. Poland, Bulgaria).

The two main factors driving waste oil collection performance are:

- cost/benefit for waste holders. If the waste holder gets paid for the waste oil (or if the collection is free for the waste holder), collection rates increase. If the waste holder has to pay a high price to have its waste oil taken from him, collection rates tend to be low
- waste holders' willingness to manage their waste legally and in an environmentally sound manner based on awareness and level of enforcement of mandatory separate collection by Member States

The necessary conditions for good collection performances are the following:

- Good level of service for waste holders, free or with a financial incentive
- Adequate supervision of collection activities / hazardous waste management by public authorities
- High waste holders' awareness

Some countries manage to meet these conditions without a specific scheme in place for waste oils, whereas others that do not have favourable conditions must take additional measures.

The characteristics of the financial support scheme appear to have more influence on collection rates than having an EPR scheme in place or not.

Key success factors when designing the financial support scheme are:

- frequent revision of the scheme based on market conditions (price of diesel fuel use for running collection trucks, base oil price, etc.), annually or more frequently
- differentiation of financial support to collectors depending on geographical areas in order to account for differences in logistical costs. This is especially necessary for countries with large differences in collection costs (overseas territories, islands, remote or sparsely populated regions, etc.)
- ensuring waste holders receive free collection service
This can be ensured by regulation, combined with financial compensation for waste collectors. This can also be ensured by designing financial support for waste holders under certain conditions of volume and delay for the collection (i.e. time between the collection request and the collection).
- monitoring by public authorities of financial support and fee scales and/or tendering procedures

If the collection price is not a sufficient incentive, illegal management must be disincentivised.

In all studied Member States, national regulations provide that waste oils must be collected separately, in line with WFD article 21. However, regulation itself does not ensure enforcement. Best practices to encourage legal collection irrespective of the price for collection are:

- communication of clear mandatory segregation practices

- awareness-raising activities on existing collection schemes and regarding hazards caused by the illegal management of waste oils
- well-functioning monitoring of waste holders, with regular controls and fines.

This can be supported by a registration system for waste holders. Fines, combined with the probability of control should, in principle, cost more to waste holders than the potential benefits from illegal practices;

- a well-functioning monitoring of waste collectors, with a well-functioning collector registration system, controls, and fines
- well-functioning monitoring of illegal waste oil treatment, including illegal fuel preparation, illegal burning by waste holders and illegal exports

The main factor affecting the quality of the collected waste oil appears to be the existence of a price incentive to ensure quality.

There are two options to provide a price incentive to ensure good quality collected waste oils:

- Option 1: Waste oil collection is based on the free market. Waste collectors organise themselves with waste holders via contractual agreements to charge them for contaminated waste oils thus encouraging them to better sort their waste oils and to pass on their additional treatment costs.
- Option 2: Regulation guarantees free collection for waste holders. The best policy practice is then to enable waste collectors to charge waste holders for contamination in order to incentivise them to segregate better waste oils, combined with:
 - mandatory quality control procedures. Quality control cost is generally included in the financial support scale as part of EPR schemes.
 - national standards set up either by public authorities or by PROs, specifying below which quality of waste oils waste collectors can charge waste holders for collection. Such standards are not necessary under option 1 (but can be part of contractual arrangements).

Price incentives can help reduce the sources of contamination which are most costly to address, e.g. PCB. For some contamination sources preventing regeneration but not energy recovery (e.g. brake fluids), the price incentive may not be sufficient to prevent contamination compared with the convenience of mixed collection. Additional policy measures may be necessary:

- precise segregation practices,
- control of waste holders,
- promotion of good separate collection practices and awareness-raising activities.

The recommendations presented in this report focus on the objective of increasing the collected quantities of waste oil and, to the extent possible promoting the collection of higher quality oils suitable for regeneration. Given the fact that the statistical data is currently limited and that according to evidence presented in the recent JRC study, regeneration does often but not always result in an overall better environmental and societal outcome than processing into fuel, increasing waste oil quality is also proposed to be priority.

Recommendations

At EU-level, collection targets that increase with time should be set.

Given the fact that high collection rates can be achieved with different policy instruments, it is more relevant to set collection rate targets than to impose specific policy measures. Waste oil collection targets are implemented at a European level and transposed into national legislation. Member States are requested to achieve an annual waste oil collection rate by a given time frame. How the targets are achieved would be left to the MS.

Since waste oil collection rates currently vary widely among Member States, two target levels are proposed:

- by 2030, the collection of waste oil should be increased to a minimum of 80 % by weight, based on generated waste oil quantities, in all Member States with a current collection rate below 80 %. Those Member States should meet the target set for the high-performing Member States in 2035: a collection rate of 95 % (see next bullet point).
- by 2030, the collection of waste oil should be increased to a minimum of 95 % by weight, based on generated waste oil quantities, in all Member States with a current collection rate between 80 and 95 %.

Member States should report on how they calculate the amounts of generated waste oil quantities¹.

Many policy measures at Member State level are recommended to increase the collection rate.

The following policy measures are relevant to increase the collected quantity at Member State level:

- Subsidy for small waste holders
- Prohibition to financially charge waste holders for collection
- Obligation for collectors to provide collection service (relevant for MS with remote areas)
- Small waste holders should be allowed to take their waste to municipal recycling points
- Specific criteria to license collectors for waste oil collection

Waste oil quality should be improved to avoid contamination leading to hazardous waste incineration, via policy measures at Member State level.

Avoiding PCB contamination is crucial because it leads to whole batches of waste oils being sent to hazardous incineration. The segregation of the contaminated waste oil should be further encouraged and enforced.

¹ in line with COMMISSION IMPLEMENTING DECISION (EU) 2019/1004 of 7 June 2019 laying down rules for the calculation, verification and reporting of data on waste in accordance with Directive 2008/98/EC of the European Parliament and of the Council and repealing Commission Implementing Decision C(2012) 2384

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D1004&rid=5>

It could be achieved via several measures at MS-level:

- Mandatory quality control by waste collectors
- Waste holders that contaminate the waste oil must pay for the treatment
- Establish guidelines that clarify the waste oils that should be kept segregated by the waste holder

French

Cette étude commanditée par la Direction Générale de l'environnement de la Commission européenne vise à soutenir l'évaluation des options pour la révision potentielle de la directive-cadre sur les déchets, en particulier en ce qui concerne les mesures visant à accroître la collecte des huiles usagées et le fonctionnement des systèmes de responsabilité élargie des producteurs (REP) pour les huiles industrielles et lubrifiantes, ainsi que les systèmes de collecte qui y sont associés.

L'étude est basée sur une analyse documentaire et sur la consultation de parties prenantes et d'experts aux niveaux européen et national. Elle fournit des données sur les performances existantes, sollicite des avis et des idées sur le problème, la faisabilité et les impacts possibles (économiques, sociales et environnementales) des mesures envisagées, recueille des exemples de bonnes pratiques et des points de vue sur la subsidiarité des mesures envisagées. L'analyse des politiques visant à promouvoir davantage la régénération des huiles usagées n'est pas couverte pas dans le cadre de cette étude (car elle fait l'objet d'une évaluation distincte dans une étude du JRC). Toutefois, cette étude analyse les interactions entre la collecte et le traitement,

Trop peu d'huiles usagées sont collectées séparément dans l'UE

La directive-cadre sur les déchets (article 21) stipule clairement que les huiles usagées doivent être collectées séparément et ne pas être mélangées avec des huiles usagées de caractéristiques différentes. Les huiles usagées étant des déchets dangereux, les États membres doivent veiller à ce que leur production, leur collecte, leur transport et leur traitement soient contrôlés et soumis à des conditions d'exploitation spécifiques et à des exigences en matière de rapports (articles 17, 18, 19, 25, 34, 35 de la directive-cadre sur les déchets).

Malgré ces règles, le rapport 2020 de la Commission intitulé "Study to support the Commission in gathering structured information and defining of reporting obligations on waste oils and other hazardous waste" (étude visant à aider la Commission à recueillir des informations structurées et à définir des obligations de notification concernant les huiles usagées et les autres déchets dangereux)³ estime que les pertes évitables d'huiles usagées représentent environ 18 % des huiles usagées collectables dans l'UE en 2017 (0,36 million de tonnes non collectées officiellement, sur 2 millions de tonnes d'huiles usagées collectables), ce qui signifie que 82 % de ce qui peut théoriquement être collecté est effectivement collecté sélectivement (ou du moins signalé comme tel).

Les huiles usagées collectées ne sont pas suffisamment envoyées à la régénération

En général, la directive-cadre sur les déchets (DCE) établit une hiérarchie des déchets qui est d'application générale et donne la préférence à la prévention des déchets par rapport à la préparation en vue du réemploi et du recyclage, suivie de la valorisation et de l'élimination. En particulier, pour les huiles usagées, l'article 21 indique une priorité pour la régénération (utilisée ici comme synonyme de "recyclage") par rapport à la combustion pour la récupération d'énergie. Les États membres qui ont des exigences spécifiques en matière de régénération peuvent interdire les exportations à des fins d'incinération ou de co-incinération, à condition de respecter le règlement (CE) n° 1013/2006 sur les transferts de déchets.

Malgré ces mesures, en moyenne, seuls 61 % des huiles usagées collectées sélectivement par les voies légales sont régénérés.

Conclusions

Il n'y a pas de conclusion claire quant à la nécessité d'une REP ou d'un autre système de collecte (par exemple, un système de dépôt-remboursement) pour garantir des taux de collecte élevés.

Les conditions nécessaires à l'obtention de bons résultats en matière de collecte sont les mêmes, qu'il y ait ou non un système de REP/collecte en place.

Certains États membres ne disposent ni d'un système de REP ni d'un système de collecte spécifique, mais obtiennent de bons résultats (par exemple, l'Allemagne et l'Autriche). En revanche, d'autres pays ont mis en place depuis longtemps un système de REP et affichent de faibles performances (Pologne, Bulgarie, par exemple).

Les deux principaux facteurs qui déterminent les performances de la collecte des huiles usagées sont les suivants :

- coût/bénéfice pour les détenteurs de déchets. Si le détenteur de déchets est payé pour les huiles usagées (ou si la collecte est gratuite pour lui), les taux de collecte augmentent. Si le détenteur de déchets doit payer un prix élevé pour que ses huiles usagées lui soient enlevées, les taux de collecte tendent à être faibles.
- la volonté des détenteurs de déchets de gérer leurs déchets légalement et d'une écologiquement responsable, en fonction de la sensibilisation et du niveau d'application de la collecte sélective obligatoire par les États membres

Les conditions nécessaires à de bonnes performances de collecte sont les suivantes :

- Bon niveau de service pour les détenteurs de déchets, gratuit ou avec une incitation financière
- Supervision adéquate des activités de collecte et de gestion des déchets dangereux par les autorités publiques
- Sensibilisation élevée des détenteurs de déchets

Certains pays parviennent à remplir ces conditions sans mettre en place de mesure politique spécifique pour les huiles usagées, tandis que d'autres, qui ne bénéficient pas de conditions favorables, doivent prendre des mesures supplémentaires.

Les caractéristiques du régime de soutien financier semblent avoir plus d'influence sur les taux de collecte que l'existence ou non d'un système de REP.

Les facteurs clés de succès lors de la conception du système de soutien financier sont les suivants :

- révision fréquente du régime en fonction des conditions du marché (prix du carburant diesel utilisé pour faire fonctionner les camions de collecte, prix de l'huile de base, etc.), annuellement ou avec une fréquence plus élevée
- la différenciation du soutien financier aux collecteurs en fonction des zones géographiques afin de tenir compte des différences de coûts logistiques. Cela est particulièrement nécessaire pour les pays où les coûts de collecte sont très hétérogènes (territoires d'outre-mer, îles, régions éloignées ou peu peuplées, etc.)
- veiller à ce que les détenteurs de déchets bénéficient d'un service de collecte gratuit
Cela peut être garanti par la réglementation, combinée à une compensation financière pour les collecteurs de déchets. Cela peut également être garanti en concevant un soutien financier pour les détenteurs de déchets sous certaines conditions de volume et de délai de collecte (c'est-à-dire le temps écoulé entre la demande de collecte et la collecte).
- le contrôle par les autorités publiques du soutien financier et des barèmes de redevances et/ou des procédures d'appel d'offres

Si le prix de la collecte n'est pas une incitation suffisante, la gestion illégale doit être découragée.

Dans tous les États membres étudiés, les réglementations nationales prévoient que les huiles usagées doivent être collectées séparément, conformément à l'article 21 de la directive-cadre sur les déchets. Toutefois, la réglementation elle-même ne garantit pas l'application de la loi. Les meilleures pratiques pour encourager la collecte légale indépendamment du prix de la collecte sont les suivantes :

- la communication de pratiques claires et obligatoires en matière de séparation des déchets
- des activités de sensibilisation aux systèmes de collecte existants et aux risques liés à la gestion illégale des huiles usagées
- une surveillance efficace des détenteurs de déchets, avec des contrôles réguliers et des amendes.

Ceci peut être soutenu par un système d'enregistrement des détenteurs de déchets. Les amendes, combinées à la probabilité d'un contrôle, devraient en principe coûter plus cher aux détenteurs de déchets que les bénéfices potentiels des pratiques illégales ;

- un contrôle efficace des collecteurs de déchets, avec un système d'enregistrement des collecteurs qui fonctionne bien, des contrôles et des amendes
- un contrôle efficace du traitement illégal des huiles usagées, y compris la préparation illégale de carburant, l'incinération illégale par les détenteurs de déchets et les exportations illégales

Le principal facteur influençant la qualité des huiles usagées collectées semble être l'existence d'une incitation par les prix pour garantir la qualité.

Il existe deux options pour inciter à la collecte d'huiles usagées de bonne qualité par le biais d'une incitation tarifaire :

- Option 1 : la collecte des huiles usagées repose sur le marché libre. Les collecteurs de déchets s'organisent avec les détenteurs de déchets par le biais d'accords contractuels pour leur faire payer les huiles usagées contaminées, ce qui les incite à mieux trier leurs huiles usagées et à répercuter leurs coûts de traitement supplémentaires.
- Option 2 : la réglementation garantit la gratuité de la collecte pour les détenteurs de déchets. La meilleure pratique politique consiste alors à permettre aux collecteurs de déchets de facturer la contamination aux détenteurs de déchets afin de les inciter à mieux trier les huiles usagées, en combinaison avec :
 - les procédures obligatoires de contrôle de la qualité. Le coût du contrôle de la qualité est généralement inclus dans le barème de soutien financier dans le cadre des programmes de REP.
 - des normes nationales établies soit par les autorités publiques, soit par les éco-organismes, spécifiant en dessous de quelle qualité d'huiles usagées les collecteurs de déchets peuvent facturer la collecte aux détenteurs de déchets. Ces normes ne sont pas nécessaires dans le cadre de l'option 1 (mais peuvent faire partie des dispositions contractuelles).

Les incitations financières peuvent contribuer à réduire les sources de contamination les plus coûteuses à traiter, par exemple les PCB. Pour certaines sources de contamination qui empêchent la régénération mais pas la récupération d'énergie (par exemple, les liquides de frein), l'incitation par le prix peut ne pas être suffisante pour empêcher la contamination par rapport à la collecte en mélange. Des mesures politiques supplémentaires peuvent s'avérer nécessaires :

- des pratiques de séparation des déchets précises,
- le contrôle des détenteurs de déchets,
- la promotion de bonnes pratiques de collecte sélective et des activités de sensibilisation.

Les recommandations présentées dans ce rapport sont axées sur l'objectif d'augmenter les quantités d'huiles usagées collectées et, dans la mesure du possible, de promouvoir la collecte d'huiles de meilleure qualité convenant à la régénération. Étant donné que les données statistiques sont actuellement limitées et que, selon les éléments présentés dans la récente étude du JRC, la régénération donne souvent, mais pas toujours, de meilleurs résultats environnementaux et sociétaux que la transformation en carburant, l'amélioration de la qualité des huiles usagées est également proposée comme une priorité.

Recommandations

Au niveau de l'UE, il convient de fixer des objectifs de collecte qui augmentent avec le temps.

Étant donné qu'il est possible d'atteindre des taux de collecte élevés avec différents instruments politiques, il est plus pertinent de fixer des objectifs de taux de collecte que d'imposer des mesures politiques spécifiques.

Les objectifs de collecte des huiles usagées sont mis en œuvre au niveau européen et transposés dans la législation nationale. Les États membres sont tenus d'atteindre un taux annuel de collecte des huiles usagées dans un délai donné. La manière dont les objectifs sont atteints est laissée à l'appréciation des États membres.

Étant donné que les taux de collecte des huiles usagées varient considérablement d'un État membre à l'autre, deux niveaux d'objectifs sont proposés :

- d'ici à 2030, la collecte des huiles usagées devrait être portée à un minimum de 80 % en poids, sur la base des quantités d'huiles usagées produites, dans tous les États membres dont le taux de collecte actuel est inférieur à 80 %. Ces États membres devraient atteindre l'objectif fixé pour les États membres les plus performants en 2035, à savoir un taux de collecte de 95 % (voir le point suivant).
- d'ici à 2030, la collecte des huiles usagées devrait être portée à un minimum de 95 % en poids, sur la base des quantités d'huiles usagées produites, dans tous les États membres dont le taux de collecte actuel se situe entre 80 et 95 %.

Les États membres devraient indiquer comment ils calculent les quantités d'huiles usagées produites².

De nombreuses mesures politiques au niveau des États membres sont recommandées pour augmenter le taux de collecte.

Les mesures politiques suivantes sont pertinentes pour augmenter la quantité collectée au niveau des États membres :

- Subvention pour les petits détenteurs de déchets

² conformément à la DÉCISION D'EXÉCUTION (UE) 2019/1004 DE LA COMMISSION du 7 juin 2019 fixant les règles pour le calcul, la vérification et la déclaration des données relatives aux déchets conformément à la directive 2008/98/CE du Parlement européen et du Conseil et abrogeant la décision d'exécution C(2012) 2384 de la Commission.

- Interdiction de faire payer la collecte aux détenteurs de déchets
- Obligation pour les collecteurs de fournir un service de collecte (pertinent pour les États membres avec des zones éloignées)
- Les petits détenteurs de déchets devraient être autorisés à déposer leurs déchets dans les déchèteries.
- Critères spécifiques pour l'octroi d'une licence aux collecteurs d'huiles usagées

La qualité des huiles usagées devrait être améliorée afin d'éviter toute contamination conduisant à l'incinération de déchets dangereux, par le biais de mesures politiques au niveau des États membres.

Il est essentiel d'éviter la contamination par les PCB, car elle entraîne l'envoi de lots entiers d'huiles usagées dans des installations d'incinération dangereuses. La séparation des huiles usagées contaminées devrait être davantage encouragée et appliquée.

Il pourrait être réalisé par le biais de plusieurs mesures au niveau des États membres :

- Contrôle de qualité obligatoire par les collecteurs de déchets
- Les détenteurs de déchets qui contaminent les huiles usagées doivent payer pour le traitement.
- Établir des lignes directrices qui précisent les huiles usagées qui doivent être séparées par le détenteur des déchets.

1. INTRODUCTION

This is the final report for a study commissioned by the European Commission's Directorate-General for the Environment to support the assessment of options for the potential revision of the Waste Framework Directive, in particular regarding measures to increase waste oil collection and to the operation of Extended Producer Responsibility (EPR) systems for industrial and lubricating oils and associated collection schemes.

Lubricating oils are produced by blending mineral, synthetic or bio-based base oils (75-80%) and adding additives to the blend. The lubricant properties, such as viscosity or resistance to oxidation, depend on the type and proportions of base oils and additives used. Lubricating oils are used in automotive and industrial applications. Automotive lubricants include engine oil, gear oil and hydraulic oil. Industrial lubricants include hydraulic oil, turbine oil, metalworking oil, transformer oil, etc³. Engine oils, used in the automotive, marine and industrial sectors, represent up to about half of all lubricant oils placed on the market. Hydraulic oils are the second largest market, with about 15% to 20% volume. Metalworking oils, for example, for drilling or rolling, are oil/water emulsions with a water content of around 90%. Finally, there are also lubricant oils such as greases and process oils that do not result in any waste oil. Proportions of the different categories of lubricating oils differ between Member States depending, among other things, on the type and size of the industry. All lubricating oils that generate waste oils are in the scope of the present study.

The study is based on a literature review and consultation of stakeholders and experts at EU and national levels. It provides evidence on existing performance; seeks opinions and insights about the problem, the feasibility and possible impacts (economic, social and environmental) of possible measures; gathers examples of best practices and views on the subsidiarity of possible measures.

The policy options related to waste oil treatment are not in the scope of this study (as they are being assessed separately by JRC). However, this study does analyse interactions between the issues related to collection and treatment, viz.:

- contextual factors related to treatment that influence collection performance (e.g. transport distance to collection and treatment facility);
- organisational aspects of collection that influence the treatment of waste oils: recycling or energy recovery (e.g. fuel use, co-incineration, incineration). This could include the degree of segregation between different oil types prior to collection.

The report is divided into 4 main parts:

- Task 1: Analysis of lubricant and industrial oil EPR systems and waste oil collection schemes: This part is composed of a brief overview of EU Member States (MS), detailed factsheets on 3 non-EU countries, and the selection criteria for the 10 selected Members States for an in-depth assessment.
- Task 2: Options to increase collection – focus on EPR and collection schemes: This part provides an outline of possible policy measures.
- Task 3: Oil data statistical analysis and support to possibly review the WFD: This part provides an analysis of the data provided by Member States as part of the mandatory Eurostat survey about oil and waste oil.

³ Oeko-Institut Study: Study to support the Commission in gathering structured information and defining of reporting obligations on waste oils and other hazardous waste, 2020, available at: <https://op.europa.eu/en/publication-detail/-/publication/73a728bc-72f5-11ea-a07e-01aa75ed71a1/language-en>.

Final Report

- Task 4: Workshop on Waste Oils EPR: This section is a workshop summary.

2. TASK 1: ANALYSIS OF LUBRICANT AND INDUSTRIAL OIL EPR SYSTEMS AND WASTE OIL COLLECTION SCHEMES

The aim of this task is to conduct background research in order to contribute to the problem definition and to the definition of policy measures.

This is a benchmarking task that will help in answering the following questions:

- What are the policy measures (or lack thereof) that contribute to good / poor collection performance?
- What are the policy measures that ensure that priority is given to regeneration?
- What type of policy measures are relevant at the EU level or Member state level?

A questionnaire was sent to the 27 Member States to get an overview of the EPR systems and waste oil collection schemes in their country. 17 MS responded to the questionnaire. Four MS with different EPR systems and waste oil collection schemes were invited to the workshop (see section 3) to present an overview of their waste oil collection system. Moreover, 10 MS were selected for in-depth analysis based on information provided in the questionnaires. An in-depth analysis (see appendix 8.2) was based on literature and targeted consultations (public authorities, PROs⁴ and waste management companies).








In addition to the EU MS, 3 non-EU countries (Australia, USA and Turkey) were selected for an assessment based on literature and targeted consultations (public authorities).

⁴ Producer responsibility organisations.








2.1. Overview of the situation in EU Member States

Information gathered throughout the questionnaires sent to the Member States is summarised in Table 1 and detailed in a separate Excel file.




Table 1: Summary information collected within EU member states and EFTA States, via questionnaires

Country	Waste oil collection system		Questionnaire
	Countries without EPR Systems	Countries with EPR systems	
Austria	<ul style="list-style-type: none"> •No EPR scheme •Collection is free of charge for households and holders of similar scale and funded by municipalities. •A take-back obligation of retailers for motor oils is also active. •Bigger waste holders need to register as such and declare their waste oil transfers. 		 3701_EC_Waste oils _Austria.pdf
Belgium	<ul style="list-style-type: none"> •Mandatory EPR scheme, active nationwide since 2007 (PRO: VALORLUB) •Financial support directed to smaller waste holders, free market in place for other actors •Free deposit of waste oils in municipal recycling centres •Volatility of prices (i.e. Towards more expensive regeneration treatments compared to energy valorisation) could lead to reinforced EPR mechanisms 		 3701_EC_Waste oils _Belgium.pdf
Bulgaria	<ul style="list-style-type: none"> •Mandatory EPR scheme active since 2006 (Six different PROs coexist nationwide) •All repair shops are contractually required to hand over collected oils •Mixing oils in a way that affects regeneration negatively is forbidden by law. 		 3701_EC_Waste oils _Bulgaria.pdf
Croatia	<ul style="list-style-type: none"> •Mandatory EPR scheme active since 2006 (PRO: FZOEU) •No financial reward for waste holders, for whom collection and storage of waste oils are compulsory •Obligation for local self-government units to establish recycling yards in their area, where citizens can deposit their waste oils. •Separation of waste oils and prioritisation of treatment towards regeneration are prescribed by the Croatian Waste Management Act. 		 3701_EC_Waste oils _Croatia.pdf
Czech Republic	<ul style="list-style-type: none"> •No EPR scheme •Mixing of oils is forbidden outside of treatment facilities •Treatment operators are paid directly by waste oil producers, and citizens can bring waste oils to civic amenity sites •Regeneration over energy recovery is encouraged by law 		 3701_EC_Waste oils _Czech Republic.pdf
Estonia	<ul style="list-style-type: none"> •No EPR scheme •A grant is distributed to local governments to arrange waste oil collection at households for free, but the collection is not free of charge for most waste holders. •Operators handling and transporting waste oils must be authorized, but there is no systematic testing of collected oils for quality assessment 		 3701_EC_Waste oils _Estonia.pdf
Finland	<ul style="list-style-type: none"> •No EPR Scheme, but there is a voluntary Green Deal agreement since 2019. •No public source of financing; waste management fees are expected to cover all costs •Small-scale collection via municipal waste management companies •No systematic rule for the financing of waste holders. In some 		 3701_EC_Waste oils _Finland.pdf

Final Report

	cases, waste oil management companies can ask for payment if oil quality is too low or pay themselves for good quality oils.	
France	<ul style="list-style-type: none"> •Mandatory EPR scheme active since 2022 (PRO: CYCLEVIA) •Free collection for waste holders, financing of collectors based on expressed market prices •Collectors register to the PRO and are allocated geographical regions of action (bonuses are given to collectors operating in less populated or harder-to-reach zones) •The PRO has the obligation to collect throughout the entire territory (including overseas) and of promotion of regeneration over other treatments 	 3701_EC_Waste oils _France.pdf
Germany	<ul style="list-style-type: none"> •No EPR scheme •Market-based system with independent collectors and treatment operators following price signals • Free-of-charge collection from small or private waste holders is possible at municipal waste sites •Overall funding of the collection through positive market value associated with recycled products 	 3701_EC_Waste oils _Germany.pdf
Hungary	<ul style="list-style-type: none"> •No EPR scheme, but an environmental product fee (green tax) on lubricating oils put on the market •An EPR scheme is to be introduced in 2023 •Collection is free of charge for waste holders •Separation of different oils is legally compulsory for waste holders and widespread in municipal collection centres 	 3701_EC_Waste oils _Hungary.pdf
Lithuania	<ul style="list-style-type: none"> •Mandatory EPR scheme active since 2005 (PRO: Manufacturers and Importers Association) •Waste holders are to keep track of generated and accumulated waste oils and submit reports. •Waste holders and collectors must keep waste oils separate and free from external contaminations. •Regeneration of waste oils is legally prioritized over energy recovery and incineration 	 3701_EC_Waste oils _Lithuania.pdf
Luxembourg	<ul style="list-style-type: none"> •No EPR scheme •Collection is not free of charge for waste holders, except at a household scale. •Most of the controls meant to ensure the quality of regenerated oils takes place at the transport phase. 	 3701_EC_Waste oils _Luxembourg.pdf
Netherlands	<ul style="list-style-type: none"> •No EPR scheme •Refundable deposit scheme for inland shipping •No systematic financial reward for waste holders •Minimum quality standards for waste oil processing 	 3701_EC_Waste oils _Netherlands.pdf
Norway	<ul style="list-style-type: none"> •No EPR scheme •Collection is not free of charge for waste holders, except for citizens at municipal collecting points. •State budget (including a tax specific to waste management) helps finance the collection scheme. •Organization of collection schemes by municipalities as well as deliverance of waste oils by industries to treatment and/or storage facilities are mandatory by law. 	 3701_EC_Waste oils _Norway.pdf

Final Report

Portugal	<ul style="list-style-type: none"> •Mandatory EPR scheme, active since 2005 (PRO: SOGILUB) •Free collection for waste holders, obligated to be registered and return their waste to the PRO •Very frequent sampling procedures to validate compliance with quality standards •Fees are based on sale prices of waste oils and reviewed annually; financing of collectors is fixed by collectors via call for tenders 	 3701_EC_Waste oils _Portugal.pdf
Spain	<ul style="list-style-type: none"> •Mandatory EPR scheme, active since 2006 (PROs: SIGAUS and SIGPI) •Financing of registered collectors, free collection for waste holders •Obligations for waste holders in regards to storage conditions and traceability, and frequent controls by re-refiners and collectors •Frequent adaptations of EPR cost models and fees based on collected quantities and oil prices 	 3701_EC_Waste oils _Spain.pdf
Sweden	<ul style="list-style-type: none"> •No EPR Scheme •Occasional free collection of waste oils directly by producers •Legal obligations to separate waste oils and prioritise regeneration options •No policies adapting collection systems to market prices 	 3701_EC_Waste oils _Sweden.pdf

2.2. In-depth assessment of 10 selected Member States and analysis of 3 non-EU countries

The selection criteria used to define the selected countries, as well as the results of the in-depth assessment of the 10 selected Member States is presented in Appendix 8.2.

The analysis of 3 non-EU countries (Australia, USA and Turkey) is in Appendix 0.

The comparative analysis of the 10 selected Member States and analysis of 3 non-EU countries is presented in the Appendix (see section 8.2)

2.3. Summary of stakeholder consultation

2.3.1. Summary of waste oil-relevant elements of the Call for Evidence on the revision of the Waste Framework Directive (WFD)

Following the Call for Evidence on the revision of the EU Waste Framework Directive (WFD), 18 stakeholders have submitted feedback (3 NGOs, 1 trade union, 2 public authorities, and 15 industry representatives and associations), out of which 12 position papers relevant to waste oil issue were received (3 by NGOs, 1 trade union, 1 public authority, 7 industry representatives and associations). There is a general agreement with the objectives of the WFD, even though four industrial stakeholders would prefer schemes that are already in place in the Member States over new EPR schemes, as the existing ones have been tried and tested, and a change in these systems would be costly and unnecessary (Federation of Norwegian Industries, FNADE, Wirtschaftskammer Österreich, FEAD).

Several stakeholders hope that the incentives and related monitoring that a new EPR scheme for waste oils could contain would discourage the illegal disposal of waste oils. Furthermore, these stakeholders indicate that the focus should be on ensuring that the existing rules are enforced in all Member States, through better monitoring and higher enforcement of existing regulations and by eliminating any existing disparities in the interpretation of existing regulations by the individual Member States (Wirtschaftskammer Österreich, CONOU, FuelsEurope, GEIR).

Many stakeholders (industry as well as NGOs) also stressed the need for ambitious targets for waste oil collection, regeneration and recycling. Due to the wide range of types of potentially concerned waste oils and related users, the risks of contamination, the definition of the objectives and the calculation method have to be clear and well-established (VEOLIA, FNADE, EEB, ACR+, PepsiCo, FuelsEurope, and Federation of Norwegian Industries). The waste hierarchy also needs to be carefully considered in this process, as using waste oil as a fuel is very problematic in energy recovery results in higher GHG emissions than regeneration and contributes more to climate change and resource depletion (GEIR, FNADE, and FEAD).

The method to compute collection and recycling targets must not lead to competitive distortion within Member States (FNADE). The problems identified by stakeholders relates to a lack of data, especially regarding recycling quotas and quantitative target values (German Umweltbundesamt).

The EPR/PRO should focus on financing the cost of collection and treatment while encouraging better eco-design and increased use of recycled materials (FNADE). If well designed, this tool can exponentially increase regenerated waste oil and enhance circular economy practices in the EU (EEB). The overall sustainability of the system is crucial when setting obligations for separate collection of waste oils. Miscellaneous waste oil fractions that cannot be regenerated should be strictly kept outside the separate collection requirements (The Finnish Forest Industry Federation). The method of calculating the regeneration rate of waste oil established needs to avoid the distortion of competition within the individual Member States (EUCPRO, FEAD, and Wirtschaftsvereinigung Stahl). Many Member States have already reached high performance in terms of waste oil collection and recovery. For instance, stakeholders raised their concerns that differentiating production costs could distort the existing competitive balance between recyclers on the market.

The fees within EPR schemes need to be such that they facilitate and accelerate the transition towards a low-carbon circular economy. Nevertheless, it is equally important that EPR fees are based on the net-cost principle, reflecting the real cost of collecting, sorting and processing each type of material for the entire quantity of those goods on the market. For an EPR system to play its role in waste reduction, it is equally important to

extend the scope of fees beyond the current understanding of the 'necessary costs'⁵, to include the costs needed to adopt waste prevention measures and clarify the possible interpretation of the issues of "the end of the waste"(EEB, Friends of the Earth, and The Finnish Forest Industry Federation). According to stakeholders, concepts such as waste prevention, reusability and recyclability must be better defined before the products are classified as waste.

There is also a need to regulate take-back responsibility for various waste streams. Practical reports show that the provisions of the Waste Oils Regulation in Germany often led to problems with the return of waste oils to the distributor. In order to facilitate disposal for citizens, a basic take-back obligation for distributors should be considered (VKU).

Another stakeholder points out the benefits and savings in terms of health impacts associated with the improvement of waste management and demands a scientifically sound and transparent assessment of its business-as-usual health impacts and costs under the legislative and policy scenarios. Failing to account for these cost reductions from avoided diseases results in overestimating the net cost of policy actions, making them less likely to be fully adopted (Vital Strategies).

There is a need for a precise definition of the concerned waste oil streams, such as waste from mineral or synthetic, lubricating or industrial oils. Waste oil streams with a poor regeneration potential or for which a high residual fraction can be expected should be excluded (EUCOPRO). There is also a need for a unified and specified labelling method for hazardous properties in waste oil, including general guidance on this type of waste, especially for waste oil that contains different ingredients that have hazardous properties (LASI SRL). This should also apply to bio-lubricants. At the end-of-life, bio-lubricants also become hazardous waste, but not only do producers of bio-lubricants not pay the subsidy to the Consortium under the Italian EPR, and there are no separation measures implemented by the waste producers or collectors. Legislation could evolve by expanding the contribution for bio-lubricants, rules for separate and segregated management and collection and solutions for targeted regeneration (CONOU).

2.3.2. Questionnaires and bilateral meetings

ATIEL⁶ thinks that the lack of awareness of the impact that proper segregation of oils has on the quality and properties of the collected waste oil batches that are sent to re-refining processes explains why not enough waste oils are regenerated. Segregated collection should be improved but in a cost-efficient manner. Awareness-raising should improve the quality of the collected waste oils without hampering the quantities.

Concawe⁷ and **Fuels Europe**⁸ mention that the segregation of different types of waste would significantly improve the quality of waste oils and foster their better use. Education is the key to improving waste management for waste generators. An easy way for collectors to test and confirm contamination and quality would also improve waste oil treatment.

⁵ According to stakeholder the "necessary costs" refer only to costs incurred to improve recycling.

⁶ Representative body for European lubricants industry.

⁷ Federations carrying out research on environmental issues relevant to the oil industry.

⁸ Federation of companies conducting refinery operations in the EU

FEAD⁹ pointed out the heterogeneous situations in Member States (context and policy regarding waste oils). Further improvement of communication and information would help improve the quality of sorting and separating different types of waste. Proper enforcement of the prohibition of mixing would also improve the quality of the collected waste oils.

According to **GEIR**¹⁰, the concept of free collection services (i.e. waste holders cannot be charged for providing the waste to collectors) can offset the lack of collection services in remote areas and/or expensive collection services for waste holders. Moreover, it is key to step-up enforcement within some Member States, especially in following the waste hierarchy.

Hazardous Waste Europe¹¹ argues that imposing high collection and regeneration/recycling rates for waste oils would be very efficient for favouring waste oils regeneration.

The completed questionnaires are provided in appendix 8.4.

⁹ European Waste Management Association.

¹⁰ Groupement Européen de l'Industrie de la Régénération, the European Re-refining Industry Section of UEIL (Union of the European Lubricants Industry).

¹¹ Federation of hazardous waste treatment installations in Europe

2.4. Problem definition

2.4.1. Introduction to the problem

Not enough waste oils are collected separately in the EU

The Waste Framework Directive (article 21) clearly states that waste oils must be separately collected and not mixed with waste oils of different characteristics. As waste oils are hazardous waste, Member States must ensure that their generation, collection, transport and treatment is monitored and subject to specific operating conditions and reporting requirements (articles 17, 18, 19, 25, 34, 35 of the Waste Framework Directive).

Despite these rules, the 2020 report of the Commission "Study to support the Commission in gathering structured information and defining of reporting obligations on waste oils and other hazardous waste"³ estimates that avoidable losses of waste oils amount to approximately 18% of collectable waste oils in the EU in 2017 (0.36 million tonnes not being collected officially, out of 2 million tonnes of collectable waste oils), meaning that 82% of what can theoretically be collected is effectively separately collected (or tracked as such).

This quantitative estimation bears uncertainty because Member States do not consistently report on their waste lubricating oil generation (different scope in terms of the type of oils being accounted) and waste oil collection (water contained in waste oil not being consistently reported). Additionally, there is uncertainty regarding the fraction of waste oil placed on the market that ends up as collectable waste oil (emission factors). Information that has been collected from Member States by Eurostat does not allow a better estimate and consistency at EU level (cf. section 4).

The official collection performance significantly varies across Member States, ranging from 38% in Romania to 100% in Germany, Italy and Latvia. This data is based on GEIR information for the year 2018. The data reported by Member States is often different than GEIR data.

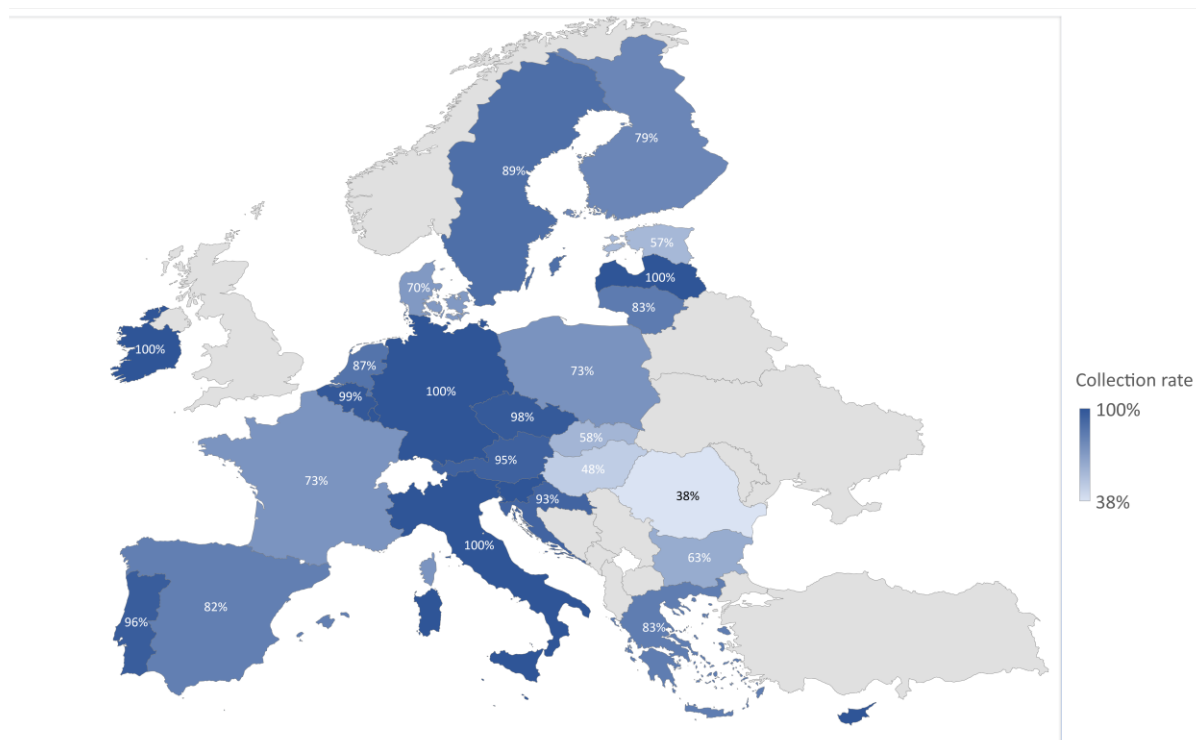


Figure 1: Waste oil collection rate in 2018 (collected/collectable) - Source: GEIR (2019)

Quantitative information is lacking regarding the management of waste oils that are not found in separate collection statistics. However, different practices explaining the gap in waste collection statistics have been reported by interviewed stakeholders and Member States:

- Burning in small heaters;
- Unreported waste collection for energy recovery or fuel preparation;
- Mixture with other (hazardous) waste, such as fuel waste;
- Reuse on site;
- Deposit in the environment (illegal disposal).

Data sources do not comprehensively reflect locations where illegal practices or statistical gaps may occur. There is also very scarce information about the occurrence of illegal practices in order to prioritise them regarding their respective influence on collection rates (cf. Table 2: Outcome of waste oils not separately collected).

Qualitative information suggests that the main practice negatively affecting the collection rates of waste oils is their illegal burning, both:

- in domestic contexts and within workshops (Spain, Croatia, Belgium, etc.). Belgian data suggests that 5% of garages burn their waste oil;
- in black market for fuel preparation for house heating (Croatia and Portugal).

Deposit in the environment appears to be rare and insignificant to explain collection rates.

Mixture with other (liquid) waste instead of source segregation is very common for sea vessel lubricating motor oil, which is often mixed with fuel oil residues before being sent to energy recovery. The proportion of waste oils that is not segregated at source is uncertain for other waste holders and types of oils. Reuse on-site is common practice for some categories of industrial lubricating oils (e.g. transformer oils). Both practices could be relatively small compared with the avoidable losses of waste oils.

Entities responsible for mismanagement are mainly waste holders. In some countries with a less controlled waste management sector, illegal collectors and treatment facilities are part of a black market. Categories of waste holders concerned by illegal /unreported collection are mostly workshops (garages), especially small ones, and households (who drain their own cars), and less so the industry.

Illegal collection and treatment could be a more frequent problem for smaller waste holders (drums of less than 200 litres or cans) such as farmers, for instance¹², and remote waste holders if the collection is market-based¹³ due to higher collection costs.

Contradictory information was received regarding the influence of waste oil prices on illegal burning practices:

- On the one hand, when oil prices are low, collection cost increases for waste holders because collectors receive less revenue from treatment facilities; waste holders

¹² FEAD, stakeholder consultations, 2022, about the French market

¹³ FEAD, stakeholder consultations, 2022, about the Finnish market

have to pay for collection and the risk that they seek cheaper alternatives increases (France¹⁴).

- On the other hand, when oil prices are high (or fuel taxes), energy consumers (including workshops themselves) are looking for a cheap alternative to conventional fuels (Croatia, Ireland, and Finland¹⁵).

In short, waste oils that are not separately collected lead to 4 main issues:

- **Direct threats to the environment and to human health.** Waste oils disposed of in the environment show detrimental impacts on water quality and biodiversity at the point of disposal. Waste oils burned in small burners for heating can negatively impact air quality and human health because these burners are not sized to burn waste lubricants adequately and are not equipped with adequate off-gas cleaning.
- **Potential threats to the environment and to human health.** Unregistered/unreported collection and treatment of hazardous waste (reuse on-site, fuel production), although these practices may generally be permitted, prevent public authorities from exercising control over these activities. It may lead to risks for the environment and human health.
- **Deviation from the waste hierarchy.** Waste illegally disposed of or sent to illegal energy recovery is not recycled (regenerated), which is not in line with the waste hierarchy.
- **Lack of level-playing field for legal operators,** threatening their business model. Although this is a theoretical possibility, in most countries that were studied in-depth, illegal operations are said to be marginal and have not been reported as a significant threat by interviewed legal operators in place. In Croatia, the black market has been reported as significant. It must be highlighted that in all analysed countries, the data quality does not allow a robust check on whether illegal operations are an issue.

Compliance with the obligation to collect separately according to article 21 of the Waste Framework Directive varies across Member States. This justifies assessing whether an EU intervention could be relevant to improve compliance with the obligation to collect separately or to revise the Waste Framework Directive in order to step up the ambition regarding waste oil separate collection. New measures to enhance the collection of waste oils could also contribute to reducing the quantity of waste oils that are not managed properly in order to redirect these quantities towards legal, environmentally sound treatment, particularly regeneration.

¹⁴ ADEME (2021) Bilan européen des filières à responsabilité élargie pour les lubrifiants. This risk has justified the creation of a public financial support and then the creation of an EPR.

¹⁵ Mentioned by FEAD members, stakeholder consultation, 2022

Table 2: Outcome of waste oils not separately collected

Practice	Description	Type of waste holders	Legal / Illegal	Magnitude to explain collection rates	Information on occurrence	Data source
Dumping in the environment	Waste oils disposed of in the environment, in or out of their packaging	Households	Illegal ¹⁶	0	Packagings containing waste oils have been found next to car repair workshops or are occasionally disposed of in rivers. Stakeholders suggest these events are relatively rare.	CYCLEVIA (France) SIGAUS (Spain)
Mixture with waste water	Waste oils are emptied down the sink	-	Illegal	0	Statistics on these small amounts of oil are not robust, but it is likely to happen in countries with a low number and accessibility of collection points.	-
Mixture with other (hazardous) waste	Waste oils are mixed with other waste, probably waste solvents, emulsions or fuels.	Industry and workshops (rare) Ships (common practice)	Illegal ¹⁷	Unclear for industry +++ for ships	One of the two main assumptions for untracked hydraulic industrial oils is mixing with other (hazardous) waste, directly or after onsite reuse. ¹⁸ Mixing ship motor lubricating oil with bilge oils (tanker fuel residue mixed with washing water) is common practice.	CHIMIREC (France) MTD/ EUROSHORE

¹⁶ Does not comply with provisions of WFD article 13 on Protection of human health and the environment

¹⁷ Does not comply with provisions of WFD article 21 on Waste oils management

¹⁸ ADEME is launching a study to understand the outcome of hydraulic industrial oil (clear waste oils), that will be completed in 2023.

Final Report

Practice	Description	Type of waste holders	Legal / Illegal	Magnitude to explain collection rates	Information on occurrence	Data source
Burning in small burners	Waste oils are burned instead of light fuel oil / mixed with light fuel oil for local space heating and in unauthorised facilities.	Workshops and households	Illegal ¹⁹	+++	<p>5% of controlled garages (out of 50-70) in Flanders (Belgium) were illegally burning their waste oil. These controls were conducted randomly, suggesting that this proportion could be considered an approximation of the magnitude of illegal practices in Flanders.</p> <p>It is estimated to be the main source of illegal management by the Spanish federation of hazardous waste collectors.</p> <p>Illegal burning developed in Corsica (France) in a context where waste oil collection was paid for by the waste holders.</p> <p>In Portugal, some waste oil holders still send their waste oils to illegal collectors (collectors without a license) who produce illegal fuels (burning waste oils). When diesel prices are high, illegal collections are more frequent.</p> <p>Black market of waste oil for house heating is still fairly common in Croatia.</p>	<p>OVAM (Belgium)</p> <p>ASEGRE (Spain)</p> <p>CYLCLEVIA (France)</p> <p>Egeo (Portugal)</p> <p>CIAN (Croatia)</p>

¹⁹ All interviewed countries require environmental permits to authorise waste oil incineration / co-incineration, which small burners / space heaters generally do not have.

Final Report

Practice	Description	Type of waste holders	Legal / Illegal	Magnitude to explain collection rates	Information on occurrence	Data source
Unreported waste collection for energy recovery	Waste oils are collected via unregistered collectors or unreported by collectors	Unclear	Illegal ²⁰	+++	Some waste oil holders still send their waste oils to illegal collectors (collectors without a license) who produce illegal fuels (burning waste oils) or send them to illegal treatment facilities. When diesel prices are high, illegal collections are more frequent.	Egeo (Portugal) CIAN (Croatia)
Reuse on site	<p>Low-polluted waste oils (especially industrial hydraulic oils) are reused:</p> <ul style="list-style-type: none"> - For greasing applications or burned in 2-stroke engines. These applications do not generate further waste oils. - Onsite for the same use 	Industry	Unclear	+	<p>One of the two main assumptions for untracked hydraulic industrial oils is reuse on-site.</p> <p>Transformer oil is commonly prepared for reuse onsite without going through conventional waste oil collection statistics.</p> <p>Only a few categories of waste oil (specific types of lubricants used by industry) may be concerned with onsite reuse.</p>	CHIMIREC (France) CONCAWE

²⁰ Hazardous waste collection, transport and treatment must be controlled and traced according to the Waste Framework Directive article 17.

Collected waste oils are not sufficiently sent to regeneration

In general, the Waste Framework Directive (WFD) establishes a waste hierarchy that is of general application and sets a preference for waste prevention over preparing for reuse and recycling, followed by recovery and disposal. In particular, for waste oils, article 21 indicates a priority for regeneration (used here as a synonym of 'recycling') over combustion for energy recovery. The MS that have specific requirements for regeneration may ban exports for incineration or co-incineration, provided they comply with Regulation (EC) No 1013/2006 on waste shipments.

Despite these measures, on average, only 61% of waste oils collected separately via legal management routes is regenerated.

Again, regeneration performance varies significantly between MS.

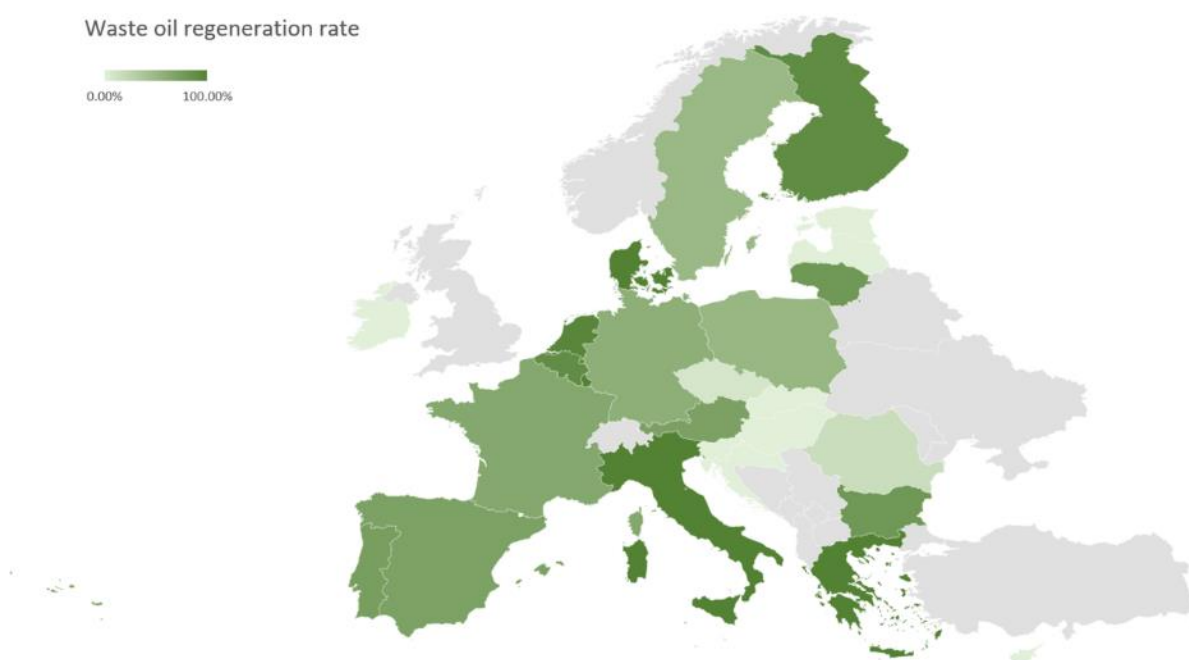


Figure 4: Waste oil regeneration rate in 2018 (regenerated/collected) - Source: GEIR (2019)

Waste oil that is not regenerated is converted into fuels, co-incinerated in cement kilns and other installations or incinerated in a hazardous waste incinerator (HWI) – options that are lower in the hierarchy. Fuel preparation, the main alternative to regeneration, generally results in lower environmental benefits^{21 22}.

Compliance with the waste hierarchy for waste oils and the obligation to prioritise regeneration (or environmentally equivalent treatment routes) according to article 21 of the Waste Framework Directive appears variable across Member States. This justifies assessing whether EU intervention could be relevant to enforce better the obligation to give priority to regeneration or to revise the Waste Framework Directive in order to step up the ambition regarding regeneration.

²¹ JRC (2023) Environmental and economic sustainability of waste lubricant oil management in the EU.

²² GEIR (2022) Updated LCA for regeneration of waste oil to base oil

2.4.2. Problem drivers

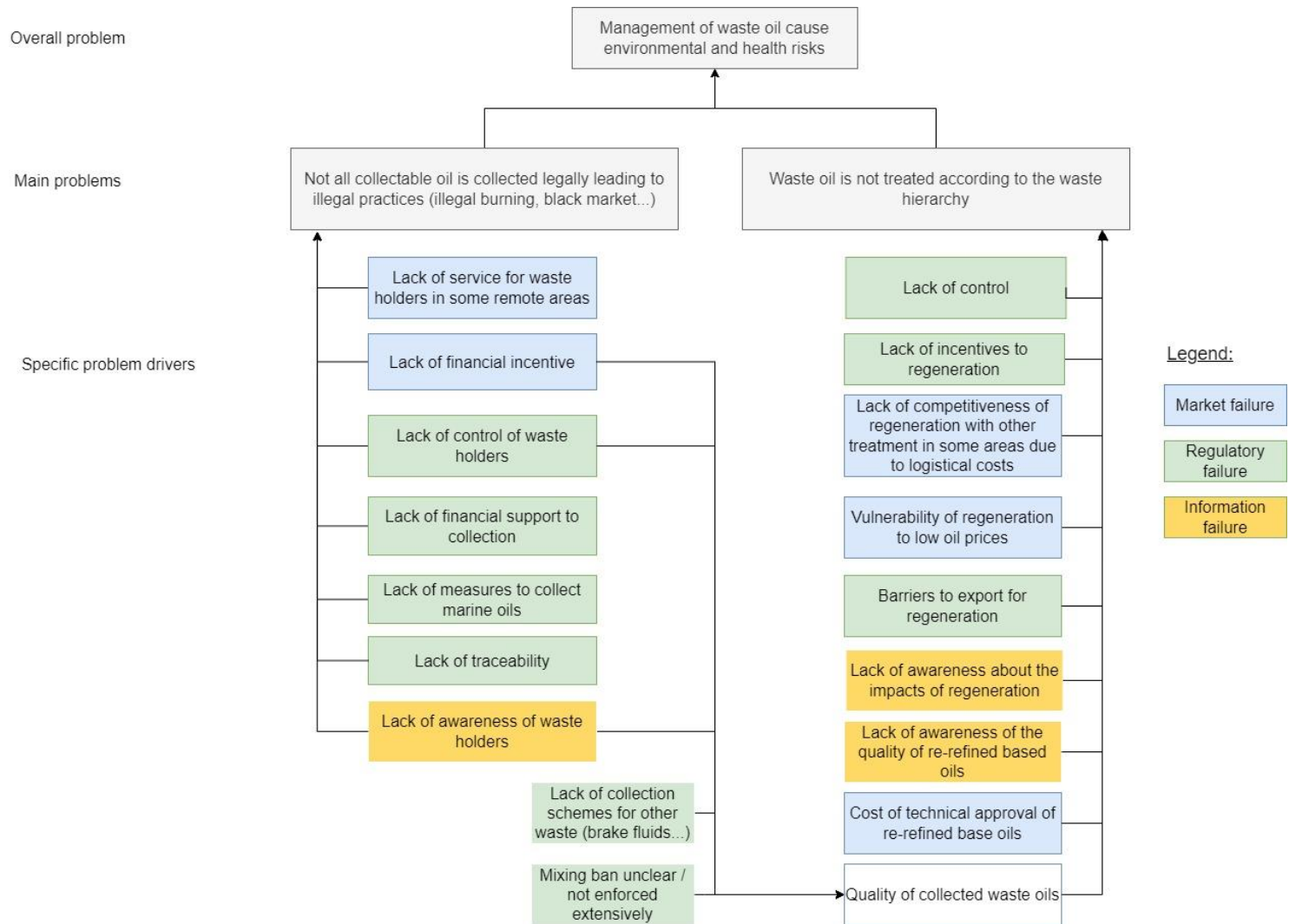


Figure 2: Drivers for the problem "Not enough waste oils are collected separately in the EU"

In some countries, regions or temporary market situations, or for some specific waste holders, incentives for waste holders to dispose of their waste oils appropriately are insufficient (cost, level of service), and current inspections envisaged to sanction illegal practices apparently do not suffice to ensure that all waste oils are collected separately.

Information from MS, non-EU countries and stakeholders (including the workshop) has been useful in understanding why part of the waste oil stream is not being tracked as separately collected and follows one of the above-mentioned undesired outcomes (cf. problem definition). In particular, several countries have modified or plan to modify their public policy framework related to waste oils in order to address a series of identified issues. The benchmarking therefore helps us list problem drivers insofar as they were identified by competent authorities.

The identified problem drivers are the following:

- **Lack of financial incentive** / Cost for waste holders to dispose of their waste oils:
 - In some countries (e.g. Germany²³, Finland, etc.), the free market situation gives sufficient incentive to most waste holders to collect their waste oils, the service is given for free, or waste oils are being bought from waste holders in some cases (depending on quantities and places).

In other countries, however, waste holders were or are asked to pay for their waste oil collection. This situation may be temporary and related to low oil prices. Indeed, in such situations, waste holders are charged more for collection because base oil prices drop, and therefore the revenue that collectors get from re-refining facilities decreases, and they pass that on to the waste holder;
 - In overseas territories, islands, remote places (mountains, country), or in places remote from appropriate treatment facilities because the logistical cost (collection and/or transport to treatment) is higher there;
 - Depends on the size of waste holders, smaller waste holders are charged more for the service.
 - In the interviewed Member States and non-EU countries which have developed a specific policy framework to improve waste oil collection, public policies have aimed first and foremost at decreasing the cost of waste oil management for waste holders. It has been viewed as strategic to ensure waste holders do not directly bear the cost of waste collection in order to avoid illegal management.
 - This has taken different forms: an interdiction for collectors to charge waste holders for collection, financial support to collectors and transport to correct the market situation (inside or outside an EPR scheme), and financial support to small waste holders.
- **Lack of adequate service for waste holders** (remote areas, contaminated oils, small waste holders, overseas and islands)
- **Lack of controls of waste holders:** Combined with situations of the collection coming at a cost and/or financial opportunity of on-site recovery, it encourages illegal management of waste oils.

²³ In Germany however the collection is not full market-based since end consumers are offered free collection services at retailers for waste engine oils and waste transmission oils.

- **Lack of awareness of waste holders:** Waste holders need to be informed about the risks of illegal management of waste oils and the existence of collection services, including access to municipal infrastructure when offered.
- **Lack of traceability,** including onsite reuse
- **Lack of control of waste collection/treatment operations**

In the case of marine oils, separation of motor oil is not a common practice; these are usually mixed with other oily waste. Additionally, a comparison of MS in terms of collection performance and potential drivers (policy and market-related) helps understand the potential causal link between contextual factors, policy framework, and collection performance.

There is a diversity of management systems for end-of-life oils among the Member States. Most countries in Northern and Central Europe do not have in place an EPR system for lubricating and industrial oils. Most countries in the West and the South of Europe have EPR systems. In Eastern Europe, the situation is more heterogeneous as three situations exist: EPR, no EPR or taxes²⁴.

The **collection rate**, i.e. collected waste oils divided by the (estimated) collectable waste oils, varies significantly across Member States: between 38 and 100 % in 2018, according to GEIR²⁵ data. All other things being equal, collection performance appears higher in countries with high population density and significant industrial activities, and nearby regeneration or energy recovery capacity. This could be explained by two reasons. Firstly, the high population density leads to lower collection costs compared to countries with a lower population density. Secondly, industrial activities lead to a bigger proportion of industrial waste oil compared to waste oils from garages. The collection cost is lower for industrial oils because the quantity per collection point is larger.

The Member States with a high collection rate do not have the same type of system: some have an EPR (e.g. Portugal, Italy) while some do not (e.g. Germany, Austria). Similarly, for the Member States with a low collection rate, a **common pattern could not be found**: some have an EPR (e.g. Bulgaria), and some do not (e.g. Romania).

²⁴ In Hungary and Romania, a tax is paid for the lubricant oil that is put on the market. 25 % of the tax is refunded for regenerated lubricant oil put on the market in Hungary. In Romania, the tax revenues go to a fund that is used for a variety of environmental protection actions (not specific to waste oils).

²⁵ Groupement Européen de l'Industrie de la Régénération.

<https://www.geir-rerefining.org/>

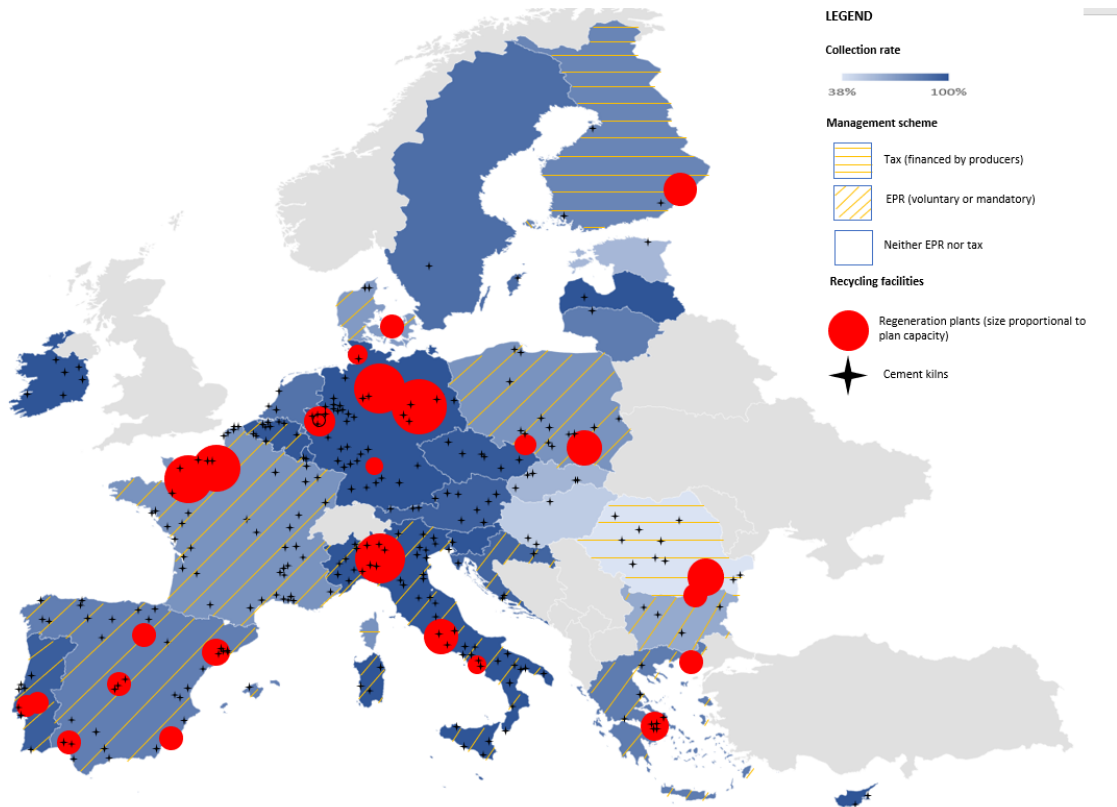


Figure 3: Waste oil management in European MS

The following table maps identified problem drivers with evidence from MS and other stakeholders.

Table 3: Waste oil collection - Problem drivers identification and level of certainty

Letter	Problem driver	Level of certainty	Evidence	Data source
A	Lack of financial incentive / Cost for waste holders to dispose of their waste oils	+++	<p>The Belgian EPR scheme decided to focus financial support on small waste holders because it was assessed that small waste holders are the ones who generally have to pay to collect their waste oil. It was assumed that for that reason they are more frequently responsible for illegal practices than waste holders who receive a revenue from waste oils. This was also motivated by the obligation to cover 80% of the net cost.</p> <p>In some specific local contexts (remote areas), larger waste holders also have to pay for collecting larger quantities of waste oils and also lack financial incentive to dispose of their waste oils properly.</p> <p>Several interviewed actors (notably collection actors) have noted the importance of free collection in optimising collection rates. Costs related to disposal by waste holders, notably payment for collection, are most likely one of the main factors negatively affecting the quantity of collected waste oils.</p> <p>.</p> <p>Croatia's fixed fees and financing rates, which do not allow for proper adaptation to market evolutions, are insufficient to cover costs associated</p>	<p>OVAM, Traxio (Belgium)</p> <p>SIGAU (Spain)</p> <p>ADEME/DGPR (France)</p> <p>CIAN (Croatia)</p> <p>FEAD (Germany)</p> <p>Workshop (Finland)</p>

Final Report

Letter		Problem driver	Level of certainty	Evidence	Data source
				<p>with the collection of smaller quantities or in more remote locations.</p> <p>This is also linked to the willingness to pay for the service. German FEAD member indicates that commercial actors are generally willing to pay for service when it comes to it, especially considering waste oil collection service is combined with other waste streams as part of a wider waste management service.</p> <p>The Finnish voluntary agreement works well when oil prices are up, but incentives for collection lack when prices are down.</p>	
B		Lack of adequate service for waste holders	+	<p>Waste oils not being collected today mostly come from low-populated parts of Spain.</p> <p>Despite EPR financing, contracting with remote waste holders may not be profitable in Spain. Contracting is generally made for waste oils and other waste streams; only waste oils are financed. This may explain the lack of service.</p> <p>Despite EPR financing for transport, collection from islands in Croatia does not fully cover the lost workforce time and is not profitable.</p> <p>Before the implementation of EPR schemes in France and Spain, remotely located waste holders (especially</p>	<p>ASEGRE (Spain)</p> <p>SERTEGO (Spain)</p> <p>CIAN (Croatia)</p> <p>ADEME/DGPR (France)</p> <p>SIGAUS (Spain)</p> <p>FEAD members (Finland, France, Belgium, Ireland)</p> <p>GEIR</p> <p>Workshop</p>

Final Report

Letter		Problem driver	Level of certainty	Evidence	Data source
				<p>holders of lesser quantities of waste oils) did not have access to efficient collection services. The financial incentive for these waste holders was low due to higher collection costs. Since collection coverage has been improved (due to financial incentives), collection rates in those countries have increased. However, it is to be noted that within most Member States considered in this study, densely populated areas, which are generally profitable to collect, account for the majority of collectable waste oils.</p> <p>Lack of service could be of medium importance in explaining collection rates in Finland.</p> <p>However, this problem is not encountered all over Europe and is described as insignificant in some countries (Irish, Belgian and German members of FEAD).</p>	
C		Lack of control of waste holders	++	<p>Only a few countries have reported targeted controls on waste holders (Belgium, Flanders) or registration of waste holders (Portugal) to ensure they have a collection contract in place.</p> <p>On the contrary, a French collection actor has indicated potential unreported use of waste oils emitted by industries within their own processes.</p> <p>The Spanish EPR has also estimated that the absence of internalized</p>	<p>OVAM (Belgium)</p> <p>APA (Portugal)</p> <p>CHIMIREC (France)</p> <p>SIGAUS (Spain)</p> <p>ASEGRE (Spain)</p>

Final Report

Letter		Problem driver	Level of certainty	Evidence	Data source
				<p>measures to control illegal practices makes it difficult to quantify them and to act on non-compliance with the scheme rules.</p> <p>Multiple interviewees highlighted the importance of control and regulation mechanisms in optimising waste oil collection. Though most of these mechanisms seem directed at improving waste oil quality (via contamination identification and charging of polluters, for instance), some improper re-use practices of waste oils by waste holders (burning, integration within the process instead of virgin oils) have been mentioned during interviews. As some of those events can take place at an industrial scale, it is plausible that it could have a notable impact on overall collection rates.</p>	
D		Lack of awareness from waste holders	++	<p>Lack of education on waste collection issues (both with regard to available solutions and their importance) is one of the main issues hampering collection in Croatia (both household and industry).</p> <p>Notably, this issue can be linked to punctual and specific situations such as inadequate signalling and communication about collection methods and rules (e.g. Separation of different types of oils in municipal waste facilities) or an overall, region-wide or nation-wide lack of</p>	<p>CIAN (Croatia)</p> <p>CIAN (Croatia)</p>

Final Report

Letter		Problem driver	Level of certainty	Evidence	Data source
				sensitization to the implications of waste oil disposal or burning. The latter could have significant negative impacts on collection rates.	
E		Lack of control of waste collection/treatment operations	+	Illegal fuel preparation was evidenced. However, there was no particular support for increased control for collectors. Consulted stakeholders such as FEAD mostly supported increased control of waste holders.	Egeo (Portugal) CIAN (Croatia)
F		Marine oils: unpractical separation of motor oil	+++	<p>Waste water containing mineral oils is treated for fuel production. There is only a limited presence of lubricating oil (a few %) used on board a seafaring vessel. Both types of oils are not separated; common practice is that all oil fractions on board a seafaring vessel are collected and mixed in their slop tank for oily liquids. Therefore, it is impossible to recover the lubricating oil fraction in this mixture with the intention of recycling it into a base oil.</p> <p>Furthermore, uncertainties concerning the inclusion of marine oils within the scope of the French and Spanish EPR schemes have been noted for waste holders and collectors (for leisure boats being collected but not for commercial boats), leading to a lack of systematic collection practices for those types of oils and to an unclear positioning of collection actors in that regard.</p>	ADEME/DGPR (France) MTD/EUROSHORE

Final Report

Letter		Problem driver	Level of certainty	Evidence	Data source
G		Lack of stable and long-term public policy	+	National management plans too short to be implemented and followed up are deemed ineffective and stagnant. This issue is specific to certain Member States (specifically in Croatia). Furthermore, it has been suggested by a Croatian collection actor that the political system in place (successive mandates with diverging strategies and little continuity) does not favour the development of long-term strategies that could lead to the establishment of efficient collection practices.	CIAN (Croatia)

The following table maps problem drivers with the above-mentioned undesired outcomes.

Table 4: Collection rates - Mapping undesired outcomes and problem drivers

Undesired outcome	Main problem drivers	Data source
Dumping in the environment	A, B, C, G	Cyclevia (France), CIAN (Croatia)
Mixture with waste water	A, B, C, D	Cyclevia (France), SIGAUS (Spain)
Mixture with other (hazardous) waste	D, F	SIGAUS (Spain), CIAN (Croatia)
Burning in small burners	A, C, G	Cyclevia (France)
Unreported fuel production	A, E, G	Cyclevia (France), Egeo (Portugal), CIAN (Croatia)
Unreported waste collection	A, C, E	Egeo (Portugal)
Reuse on site for applications in which waste oils are lost (greasing)	C	Chimirec (France)

Finally, problem drivers were qualitatively prioritised in terms of relative impact on collection rates in Table 5. Evidence used to prioritise problem drivers were:

- Stakeholder consultations
- Observed correlation between performance and drivers
- Inputs from the workshop

Estimations of the proportion of Member States affected by drivers and the extent to which drivers affected collection were jointly considered for the ranking of priorities.

Table 5: Collection rates - Prioritisation of problem drivers

N°	Problem driver	Proportion of MS affected ²⁶	Importance when the problem materialises
1	Lack of financial incentive / Cost for waste holders to dispose of their waste oils	++	+++
2	Lack of adequate service for waste holders	++	+++
3	Lack of control of waste holders	+++	++
4	Lack of awareness from waste holders	++	++

²⁶ +: one or a few, ++: several / many, +++ : all or almost all

N°	Problem driver	Proportion of MS affected ²⁶	Importance when the problem materialises
5	Lack of stable public policy	+	+++
6	Lack of control of waste collection / treatment operations	+++	+
7	Marine oils: unpractical separation of motor oil	++ (specific to coastal countries)	+

Collected waste oils are not sufficiently sent to regeneration

In most situations, the price paid by re-refiners to waste collectors is higher than the price paid by other treatment modes (processed into fuel, co-incineration in cement kilns)²⁷; therefore, **there is no generalised market failure**. Operational regeneration capacities in the EU overall (1.2 - 1.3 million tonnes) is not the main issue to explain regeneration rates which still have a high room for improvement since it slightly exceeds what is actually treated by regeneration (1.1 million tonnes), and new re-refineries projects have been identified (e.g. in Portugal). However, more capacities would be needed if all waste oils being collected were sent to re-refining (and if collection rates increase).

In fact, several problem drivers explain moderate regeneration rates:

- **Regeneration capacities are unevenly spread** over the EU. Some Member States (e.g. Greece) have free capacities (capacities exceeding national regeneration figures), while others have no facilities at all. The intra-EU trade of waste oil partly compensates for this situation; for instance, although Belgium has no regeneration capacity, 95% of waste oils collected in Belgium are regenerated (in neighbouring countries). Other countries without regeneration capacity (e.g. Croatia, Ireland) do not significantly export / chose not to export waste oils for regeneration (e.g. taxation on waste oils sent for treatment in other EU Member States) and therefore end up with very low regeneration rates, most of the waste oil going to energy recovery.

In summary, the distribution of capacities hampers regeneration via two mechanisms:

- **logistical costs** to reach regeneration facilities, making energy recovery overall more competitive (e.g. in Ireland, there are close-by outlets to process into fuel or to use waste oils as fuels in aggregate and quarrying industries; in France, the two existing facilities are located in the same region, leaving some other areas very far from regeneration capacities)²⁸;
 - **barriers to exports for regeneration** (e.g. Croatian waste oils taxed when sent for regeneration in other Member States; in Spain, financial support to treatment as part of the EPR scheme is not awarded to facilities located in other Member States).
- **Lack of incentive to regeneration:** despite the general obligation to comply with the waste hierarchy according to WFD article 21, only some MS have implemented specific instruments to incentivise regeneration (financial support, targets etc.). On

²⁷ IFEU/RDC (2021). Background data collection for waste oil treatment

²⁸ FEAD, stakeholder consultation (2022)

the other hand, there is a favourable market context to process waste oils into fuel due to the rising demand for low-sulphur fuels²⁹;

- **Variability of virgin oil prices**, making regeneration less competitive than energy recovery (possibly including illegal burning and illegal fuel preparation) when virgin oil prices are on the lower end³⁰.
- **Lack of awareness about the potential positive impacts of regeneration** has been raised by some stakeholders³¹. Incorporating recycled base oils and recycling waste oils instead of sending them to energy recovery delivers environmental benefits in most cases, notably reducing greenhouse gas emissions, that are not sufficiently known or not sufficiently internalised.
 - on the one hand, for lubricant producers, in comparison with virgin base oils, as long as the quality is met;
 - on the other hand, for collectors to discourage direction towards energy recovery.
- **Lack of awareness of the quality of re-refined base oils** on final lubricating products. There has been a negative perception of re-refined base oils by consumers in the past, but nowadays, the quality is appraised based on technical specifications.
- **Cost of technical approval of re-refined base oils** by lubricant users plays a role in decreasing the demand for regenerated base oils, according to ATIEL
- **Quality of collected waste oil**

The quality of collected waste oil directly affects the possibility to re-refine waste oils into base oils. **Thermal stability, filterability and cleanliness** are the key quality requirements to ensure waste oils can be re-refined. Variable quality also affects demand from lubricant producers. ATIEL³² also indicates that “segregation of different used lubricants would be key to improve the feasibility of re-refining”.

GEIR indicates that instances of deliberate mixing of regenerable waste oils with non-regenerable waste oils occur. Today, some waste oil is sent to energy recovery because of its low quality.

For instance, waste oil sent to cement kilns usually encompasses oil sludges, emulsions (oil waste mixed with water), tank bottoms etc. Waste oil incinerated in HWI is generally contaminated with PCB or has a high chlorine content and is neither suitable for regeneration nor co-incineration in cement kilns. On the other hand, part of the waste oils sent to fuel preparation would be suitable for regeneration (Hazardous Waste Europe).

Regarding the hierarchy of problem drivers, the quality of collected waste oils has variable importance depending on the Member State.

²⁹ FEAD, GEIR, stakeholder consultation (2022)

³⁰ CONCAWE, stakeholder consultation (2022)

³¹ ATIEL, FEAD, stakeholder consultation (2022)

³² Source: stakeholder consultation, 2022

For example, this is the dominant factor to explain why some waste oils are not regenerated in MS such as Portugal or Belgium that show the highest regeneration rates in Europe^{27 33}. In Portugal, two-thirds of waste oils that is not sent to regeneration is not technically suitable for regeneration³⁴. In both countries, regeneration rates are driven by regeneration targets and EPR schemes adding quality requirements and awareness-raising activities.

In some other MS, the regeneration rate is close to 0 (e.g. Croatia), which cannot be solely explained by the quality of collected waste oils.

Additionally, the proportion of regenerable waste oils could be further increased, even in countries where performance is relatively good, if adequate actions were undertaken. For example, Hazardous Waste Europe³⁵ estimates that 5-10% of waste oils today are non-regenerable, and this ratio could further decrease over time thanks to obligations to favour good practices in terms of separate collection such as through EPR schemes (e.g. the implementation of a separate collection scheme for brake fluids, so as to avoid them being mixed with lubricating oils).

As part of this study focused on improving the collection, the issue of the quality of collected waste oils was the only problem driver studied in-depth. Other problem drivers are addressed by the Joint Research Center in a separate study.

The following tables map the different quality issues observed in view of regeneration.

³³ Source: FEAD, stakeholder consultation, 2022

³⁴ According to SOGILUB annual report to APA, 12% of collected waste oils is unsuitable for regeneration, out of 18% of Portuguese waste oils that is effectively not sent to regeneration. In other terms, 6% is technically suitable for regeneration but is not regenerated.

³⁵ Source: stakeholder consultation, 2022. Hazardous Waste Europe represents the main players of waste oils collection and treatment (regeneration and unregenerable waste oils treatment) in France as well as some waste oil collectors active in Belgium.

Table 6: Main contaminants of waste oils

Contamination source	Frequency	Severity	Consequence	Cause	Type of waste holders/source	Data source
PCB	++ ³⁶ (declining)	++++	If > 50ppm, mandatory disposal in adequate HWI to destroy PCB pursuant to EU Regulation 2019/1021 on POP substances	Insulating oils coming from old electric transformers. There is no financing in place for PCB-contaminated waste oils, and the cost of waste management lies with the owner of the transformer.	Energy providers, railway network managers and large industries. However, PCB-contaminated oils are most frequently found in waste oils collected from municipal recycling stations (France, Belgium), suggesting malicious practices.	Véolia (France) Chimirec (France) Traxio (Belgium)
Chlorine	0/+	+++	Not accepted for regeneration if > 0.5-0.6% chlorine. To prevent corrosion, mixture with low chlorine batches is commonly applied. Not accepted by cement kilns to avoid costly off-gas cleaning	Chlorinated solvents used for washing activities Chlorinated lubricating oils	Metal treatment activities	Véolia (France) FEAD
Phosphorus	0/+	++	Undesired by regeneration facilities	Phosphorus-containing oil ester-	Energy and aerospace industries	Véolia (France)

³⁶ Chimirec, a French collector indicates that approximately 5% of waste oils being collected are contaminated by PCB.

Final Report

Contamination source	Frequency	Severity	Consequence	Cause	Type of waste holders/source	Data source
				based hydraulic fluids) used for fire-resisting properties		
Silicon	0/+	++	Undesired by regeneration facilities	Unclear	Possibly refrigeration systems	Véolia (France)
Sulphur	0/+	NA	To prevent corrosion and catalyst poisoning for hydrotreatment processes	Sulfur-containing oils	Unclear	ADEME/DGPR (France) FEAD
Vegetal oils (FAME ³⁷) and other hydrocarbons	+++	+++	Undesired by regeneration facilities if > 0.5-0.7%. Leads to saponification (soap formation) inside regeneration facilities	Mixing with edible / cooking oils by lack of clear visual aids / sorting instructions Mixing with different hydrocarbons	Municipal recycling stations (probably a mixture of cooking oils with lubricating oils) Garages	Véolia (France) Carmona (Portugal)
Water	+++	+	Acceptance criteria by regeneration facilities (1%-8%) Additional cost for decantation	Mixing with washing water Mixing with coolant / anti-freezing, which contains water	Industry, garages Cf. below	Véolia (France) Sertego (Spain)

³⁷ Fatty acid methyl esters.

Final Report

Contamination source	Frequency	Severity	Consequence	Cause	Type of waste holders/source	Data source
			Additional cost for transportation (linked to added weight/volume) Indicator of further contamination			
Sediments	++	+	Acceptation criteria by regeneration facilities Additional cost for filtration	Abrasion Mixing	All waste holders	Sogilub / Ecolub (Portugal)
Glycols	+++	++	Undesired by regeneration: glycols are not mineral oils Tolerated by energy recovery until a certain point	Brake fluid Coolant / anti-freezing	Municipal recycling stations Garages (especially small ones) End of Life Vehicles centres	Chimirec (France) OVAM, Avista oil (Belgium) Carmona (Portugal)
Fuel / solvents	++	++	Reduces flash point (limit temperature for fire and explosion risks) down to a point where input is no longer accepted as part of permits			FEAD
Metals	+	N/A	N/A	N/A	N/A	FEAD

Contamination causes variable severity. Some contaminants frequently prevent both regeneration and energy recovery (PCB, chlorine). Other contaminants hamper regeneration (e.g. phosphorus, glycols, vegetal oils) but not energy recovery. Finally, some contaminants increase the cost of preparing for regeneration but do not technically prevent regeneration as they can be easily removed (water, sediments).

Acceptance thresholds depend on the technology; the more robust the technology is, the less stringent the acceptance criteria are³⁸. There is no general consensus within the re-refining industry regarding quantitative acceptance criteria. Still, there is a general consensus regarding the important contaminants to be avoided and the importance of re-refining processing to comply with BAT provisions.

Contamination is mostly caused by improper mixing practices by waste holders (PCB, glycols, vegetal oils). These practices are due to:

- lack of awareness (lack of knowledge and lack of understanding of consequences);
- practical barriers to separation / cost-cutting strategies (mixing with other liquid waste and with bilge oils on ships);
- and malicious practices (PCB)

However, some sources of contamination (phosphorus, chlorine, possibly sulphur) may be due to the lubricating oil product composition itself.

Major sources of contamination differ between MS:

- In France, civic amenity sites appear to be the main source of contamination (PCB, glycols, vegetable oils), although garages and industries have also been mentioned
- In Spain, industries seem responsible for more contamination cases than workshops.
- In Portugal, contamination mostly comes from workshops (and ELV collection centres to a smaller extent), where the mixing of different liquid waste with waste oils happens. There is less contamination from the industry as they usually do not mix used oils.

A smart collection strategy is to collect and store waste oil from similar origins together and mix them with other batches only after quality control. This may not be economically feasible depending on the quantities involved by origin (logistics cost).

³⁸ GEIR, stakeholder consultation, 2022

Table 7: Waste oil collection quality - Problem drivers identification and level of certainty

N°	Problem driver	Level of certainty	Evidence	Data source
A	Lack of awareness from waste holders	++	It has been reported by French interviewees that the mixing of substances taking place in municipal waste facilities could be related to insufficient and/or confusing signalling on-site.	CYCLEVIA (France)
B	Cost of separate collection for waste holders (especially small waste streams)	++	<p>Forbidden mixing of waste streams implies separate storage of substances. Thus, more storage space is potentially needed, as well as added logistical constraints. This can lead to waste holders mixing substances, affecting the overall quality of collected waste oils.</p> <p>For waste collectors, different batches are mixed together in the same collection truck, often leading to more quantities being contaminated.</p>	SIG AUS (Spain) FEAD
C	No extensive mixing ban	++	Apart from PCB, chlorine and edible oils, other contaminations are not particularly avoided because regeneration is not targeted.	CIAN (Croatia)
D	Lack of incentive to waste holders for quality	+	In EPR schemes where the collection is given for free without quality criteria, there is	Workshop

Final Report

N°	Problem driver	Level of certainty	Evidence	Data source
			no sufficient incentive for waste holders to ensure quality.	
E	Insufficient information and supervised collection in municipal recycling stations	+	Unclear signalling and information with regard to the separation of substances in municipal waste facilities is leading to the mixing of different types of oils (e.g. cooking oils with lubricant oils).	CYCLEVIA (France)
F	Lack of collection scheme for other waste	+++	A separate collection of different substances (especially brake fluids) might lead to additional costs for waste holders (for instance, if some of them are not part of any EPR scheme). Therefore, some waste holders mix different waste flows to be collected for free by a single collection actor.	SERTEGO (Spain)
G	Lack of knowledge of the source of contamination	+++	Some sources of contamination are still not fully understood (hydrocarbons, chlorine, phosphorus, sulphur, silicon, etc.)	All
H	Lack of control	++	It has been stated by Spanish actors that reinforced control efforts from local fraud prevention agencies seem to have helped mitigate the illegal instances of substance mixing.	ASEGRE (Spain) CIAN (Croatia) SOGILUB (Portugal)

Final Report

N°	Problem driver	Level of certainty	Evidence	Data source
			<p>On the contrary, the lack of control efforts in Croatia (both in terms of practices and, in the past, of waste oil quality assessment) could have been an incentive for people to mix different waste flows.</p> <p>Portuguese stakeholders agreed that it would be beneficial to introduce more controls, by local public authorities, on waste holders' waste oils storage practices, as this would reduce the contaminated waste oils by encouraging waste holders to separate the different types of oil.</p>	
I	Lubricating oil design	++	Some substances (phosphorus, chlorine, etc.) found in collected waste oils and negatively affecting their regenerability are present in the virgin oils' original composition.	CYCLEVIA (France) CHIMIREC (France) FEAD GEIR
J	Mixing waste oil batches of different quality by waste collectors	+++	Waste oil collection trucks are usually made of one chamber and not multi-chamber. To reduce logistical costs and avoid testing delays, collection companies usually mix waste oils collected from different waste holders. Quality tests are usually conducted on full truck batches. Mixing waste oil of different quality levels is therefore	CONCAWE FEAD GEIR Véolia (France)

Final Report

N°	Problem driver	Level of certainty	Evidence	Data source
			possible. They try to mix waste oil of similar origin and quality whenever possible, but this is not systematic depending on logistical cost.	

No quantitative data is available to support the prioritisation of problem drivers. Qualitatively, the main problem drivers are:

- lack of awareness;
- lack of control of waste holders;
- lack of collection scheme for brake fluids;
- lack of financial incentive when there is a public policy to support free collection;
- no extensive mixing ban.

Table 8: Mapping contamination source with problem drivers

Contamination source	Problem driver	Data source
PCB	E, D, H, F	CYCLEVIA (France), SERTEGO (Spain), CIAN (Croatia)
Chlorine	A, D, H, I	CYCLEVIA (France), CIAN (Croatia)
Phosphorus	G, I	CIAN (Croatia), CHIMIREC (France)
Silicon	G	CYCLEVIA (France)
Sulphur	I	FEAD
Vegetable oils and other hydrocarbons	E, A	CYCLEVIA (France)
Water	B, D, H	SIGAUUS (Spain)
Sediments	G, D	FEAD
Glycols	B, C, D, F	CYCLEVIA (France)

2.4.3. Expected evolution of the problem without new intervention

Illegal burning of waste oil mostly happens in small car repair workshops. However, these small workshops are decreasing to the benefit of larger ones, according to the Belgian Producer Responsibility Organisation VALORLUB. This issue, therefore, tends to solve itself.

Illegal waste dumping and illegal mixing are related to the environmental awareness of waste holders, which tends to increase over time and with new generations of professionals dealing with waste (Spain, Portugal).

National authorities have increased controls or adopted new rules to reduce the illegal burning of waste oils (end of waste criteria in Spain, controls in Belgium and Spain, awareness raising in several countries).

Several EPR schemes authorise billing waste holders when contaminated batches are detected.

Planned interventions by Member States and stakeholders include conducting studies aiming to identify local levers to optimise collection rates of waste oils (France), the development and continued construction of recently implemented EPR schemes (France), and revisions of regulations towards more ambitious collection objectives.

Some new interventions may be relevant, at EU or at MS level.

2.5. Best policy practices

2.5.1. Overview

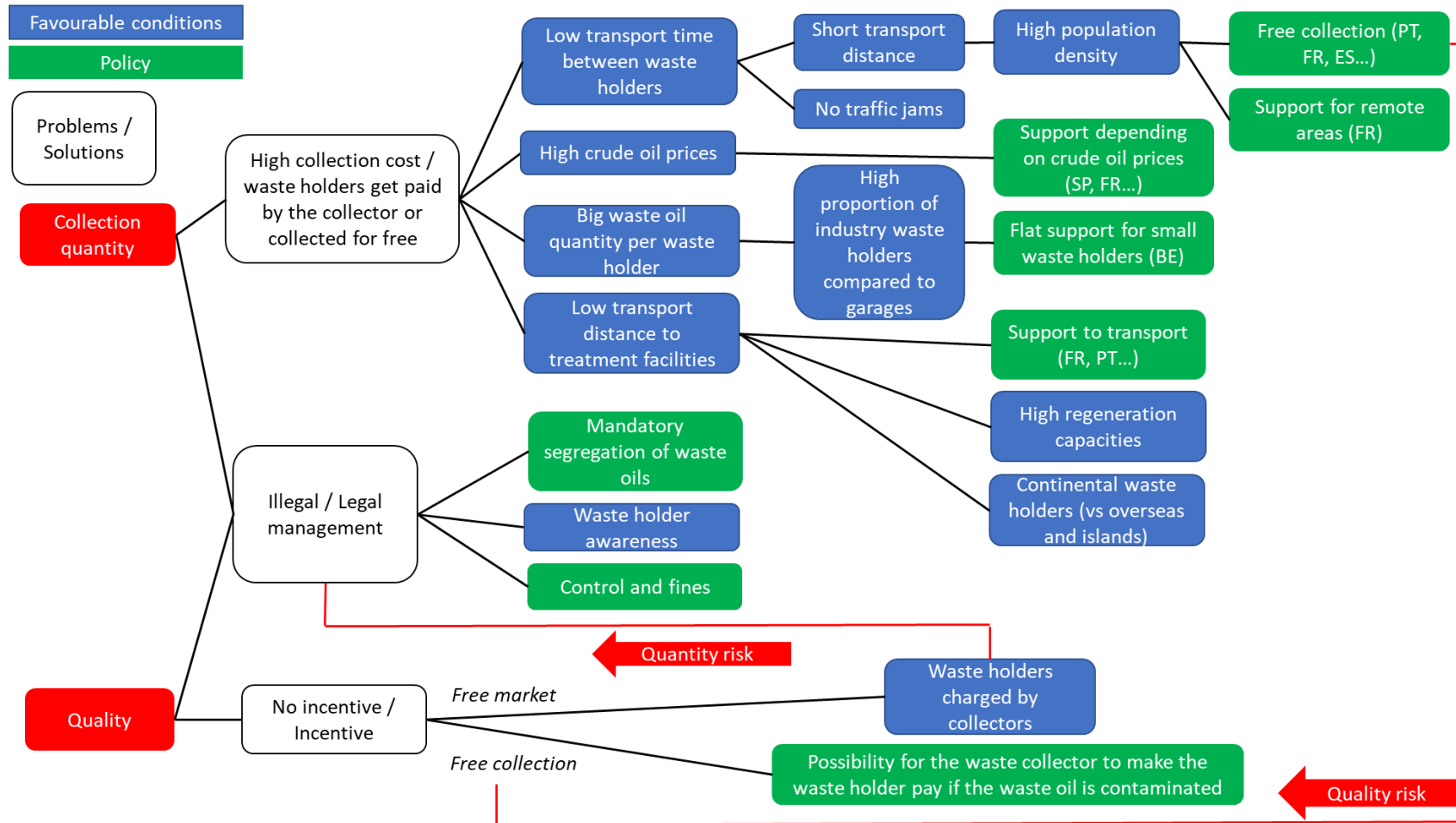


Figure 4: Overview of best policy practices depending on context factors

2.5.2. Collection rates

There is no clear conclusion as to whether an EPR or other collection scheme (e.g. deposit-refund scheme) is necessary to ensure high collection rates. Some MS have neither an EPR scheme nor a specific collection scheme in place but perform well (e.g. Germany, Austria). In contrast, other countries have a long-standing EPR scheme in place and show low performances (e.g. Poland, Bulgaria).

It is clear, however, that there are two main factors driving waste oil collection performance:

- cost/benefit for waste holders. If the waste holder gets paid for the waste oil, collection rates increase. If the waste holder has to pay a high price to have his oil waste taken from him, collection rates tend to be low.
- waste holders' willingness to manage their waste legally based on awareness and level of enforcement of mandatory separate collection by Member States.

In other terms, collection rates are high where the collection is profitable i.e.:

- where waste holders receive money for their waste or collection is for free, or
- where they are willing to pay the market price for their waste management. Areas, where the cost exceeds the willingness to pay may not be serviced, and this will result in illegal management.

Collection price

Collection price is a combination of market factors and, if any, financial support from public authorities or the Producer Responsibility Organisation.

In a full market situation (no EPR, no financial support), collection operators finance their activity solely through:

- the sales of waste oil to regenerators, fuel producers and, in some countries to stakeholders that use waste oil for energy recovery³⁹;
- the collection fee charged to waste holders.

Collection price is based on collection cost only and may come at a cost for (some) waste holders if some of these conditions are met:

- waste holders generate small volumes, increasing logistical cost per tonne collected;
- transport time is long between waste holders (long distances between waste holders due to population density and high traffic);
- local demand for waste oil is low due to low oil prices or uneven distribution of capacities (large distances for waste oil to be treated).

On the contrary, the waste holder may receive money if conditions are favourable, for example, when waste holders have a big and frequent waste oil production⁴⁰. This is the case in most parts of Germany.

³⁹ In some MS, treatment facilities using waste oils for energy recovery gets paid.

⁴⁰ Industries or for example a public transport company that manages the repairs and maintenance of their fleet.

The management of waste oil collection and treatment in Germany is market-based. Collectors are paid by treatment operators based on the quality and quantity of the waste oils. A representative from the Ministry of the Environment explained that there is generally no fee for private households. However, some municipalities charge a small fee from individual oil producers depending on the quantity.

When market conditions ensure waste holders are paid for their waste oils, no additional public policy may be required to reach good collection performances. On the contrary, when this is not the case, the best policy practice is to envisage a financial support scheme as part of an EPR scheme or of a public support scheme.

There are multiple forms of financial support to the value chain that have been identified in the EU:

- financial support to smaller waste holders for which the net collection cost is positive, while keeping a free market (Belgium);
- financial support to waste collectors (Italy, Spain, Portugal, France)
- financial support to waste regenerators, which also benefits the net collection cost (Spain, Italy and France).

These are all valid options to compensate for the net cost of collection. Support to waste collectors and regenerators requires either a tendering procedure (selecting eligible collectors and regenerators) or investigating market prices to set up an adequate support scale. **Support for waste collectors is always combined with an prohibition to charge waste holders for collection.** Support for small waste holders only requires investigating market prices and does not require banning waste holders from being charged (free market).

In the end, the characteristics of the financial support scheme appear to have more influence on collection rates than having an EPR scheme in place or not.

Key success factors when designing the financial support scheme are:

- frequent revision based on market conditions (the price of diesel fuel used for running collection trucks, base oil price, etc.), annually or more frequently.
 - Financial support (and related revenue source) is revised frequently in Portugal, Italy, Spain and France. Where this is not the case (Croatia, Australia), this is viewed as a limitation of the system and leads to inadequate support levels at times, and limited incentive to the collection.
- differentiation of financial support depending on geographical areas in order to account for differences in logistical costs. This is especially necessary for countries with large differences in collection costs (overseas territories, islands, remote regions, etc.). Belgium is an exception, where the support for small waste holders is the same across the country. This can be justified by a negligible disparity of collection costs across the country due to its small size and the country's characteristics being relatively homogeneous. It has to be noted that in the less dense part of the country (Wallonia), there is an obligation for collectors to collect waste of waste holders above a certain volume to ensure that less profitable areas are serviced.
- ensuring waste holders receive free collection service
 - This can be ensured by regulation (France, Spain, Portugal, Italy), combined with financial compensation for waste collectors. This can also be ensured by designing financial support for waste holders under certain conditions of volume and delay (Belgium).

- monitoring of financial support and fee scales and/or tendering procedures by public authorities.

For example, Greece has an EPR in place but does not guarantee free collection across the territory and does not specifically support collection in remote areas, which may explain relative underperformance compared with other MS with EPR⁴¹.

To a lower extent, free access to municipal drop-off points for households who drain their own vehicle is a good practice to avoid illegal drop-offs, although it does not significantly contribute to collection rates due to the small proportion of households that drain their own car.

Level of service

Although the lack of service for certain categories of waste oils was not listed as a problem driver by consulted stakeholders, a few MS have implemented solutions that increase the level of service for waste holders:

- mandatory take-back of waste oils that do not comply with regeneration standards, although this lifts the obligation for waste collectors to provide free collection service, can be a good practice to avoid illegal management and ensure that contaminated waste oils are dealt with by professional operators. However, the risk remains that contaminated waste oils are mixed with clean waste oils (cf. quality below).
- mandatory take-back of waste oil from small professional waste holders in municipal recycling stations can lift the administrative burden of finding and contracting with a collector for small volumes.

Enforcing proper waste management

If the collection price is not a sufficient incentive, illegal management must be disincentivised.

In all studied Member States, national regulations provide that waste oils must be collected separately, in line with WFD article 21. However, regulation itself does not ensure enforcement. Best practices to encourage legal collection irrespective of the price for collection are:

- communication of clear mandatory segregation practices,
- awareness raising activities on existing collection schemes and regarding hazards caused by waste oil illegal treatment,
- well-functioning monitoring of waste holders, with regular controls and fines. This can be supported by a registration system for waste holders. Fines, combined with the probability of control should, in principle, cost more to waste holders than the potential benefits from illegal practices;
- a well-functioning monitoring of waste collectors, with a well-functioning collector registration system, controls, and fines;
- well-functioning monitoring of illegal waste oil treatment, including illegal fuel preparation, illegal burning by waste holders and illegal exports;

⁴¹ GEIR reports Spain with a collection rate of 82% which is similar to Greece, but Spain reports a significantly higher collection rate: 95% based on collectable amount. In Spain, estimated volume of collectable waste oils in 2021 is 48% of quantities put on the market, which is significantly lower than that for other MS: expressed collection rates may potentially be positively affected and therefore overestimated in Spain.

Collection scheme

Several countries that did or do not meet some of these conditions (price, level of service, legal management) have decided to set up an EPR/collection scheme in order to improve their collection performance and address the issue of illegal collection of waste oils. These countries were generally facing illegal practices of waste oil management, potentially partly due to waste holders being charged for collection, which drives collection costs high, and/or further away from the regeneration plants, or had been aware of significant illegal management practices.

Table 9 : Motivations to set up an EPR scheme (context before the EPR)

	Year	Lack of service waste for holders	Waste holders had to pay	Illegal collection / disposal	Illegal mixing (quality)	Cost of financial support for the public budget	Illegal treatment	Insufficient priority for regeneration
Belgium	2007		X	x	X			x
Italy	1982			x			x	
Spain	2006	x	X			x		
Greece	2004		X	x			x	x
Croatia	2006	x	X	x		x		
Portugal	2005	x	X	x			x	x
France	2022					x		x
Australia	2000							x
California	1991			x				
Turkey	2015		x	x	x		x	x

Sources: this study and ADEME - European review of extended producer responsibility (EPR) schemes for lubricants (2021)

EPR schemes generally include different policy measures as solutions to several problem drivers:

- financial support for collection and/or free access to convenient collection points;
- traceability of waste oils and supervision of waste oil management;
- awareness-raising activities.

It is worth noting that these measures can also be adopted without setting up an EPR scheme and by extending the duties of the competent authorities.

Collection targets and additional reporting obligations, as well as PRO approval / licensing procedures, are used to ensure the efficiency of the scheme and the performance of the Producer Responsibility Organisation / public agency to which the organisation of the scheme is generally delegated but is not a self-sufficient measure. No country has adopted collection targets without adopting a collection scheme.

In conclusion, the **necessary conditions for good collection performances are the same with or without an EPR/collection scheme:**

- Good level of service for waste holders, free or with a financial incentive
- Adequate supervision of collection activities / hazardous waste management by public authorities
- High waste holders' awareness

Some countries manage to meet these conditions without a specific scheme in place for waste oils, whereas others that do not have favourable conditions (see Figure 4 for the favourable conditions) must take additional measures.

Some choices are country-dependant, depending on the national context, and do not appear to have a positive or negative influence on the collection performance:

- Financial support to regeneration;
 - To improve collection, the net cost of the collection must be compensated. Financial support for regeneration is a form of indirect support to collection (with additional co-benefits on regeneration rates, outside the scope of the present study). Direct support to collection (to collectors or waste holders) has a more direct influence on collection rates and can reach similar performances on collection targets.
- Financial or organisational EPR scheme, i.e. choice of collection operators by the PRO or not;
 - Some MS chose to delegate the choice of collectors to Producer Responsibility Organisations via tendering procedures (Portugal), appointing one waste collecting company for each geographical area. Other MS (Italy, Spain) require PRO to finance all waste collectors complying with minimal conditions (such as registration, statistics sharing, etc.) without any selection. Countries, where a well-functioning market with multiple operators existed before setting up the EPR scheme, decided not to require tendering procedures. Waste holders remain free to choose their waste collector amongst authorised collectors. No influence on collection performances was identified.

Table 10: Policy measures to increase collection

Solution	Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
Free collection service	Financial support	A2	Financial support per litre of collected WO ⁴² (subsidy or via EPR scheme)	Compensates net cost of waste collection	Encourages waste collectors to collect less profitable areas	FR, ES, PT, IT, HR ⁴³ , FI	Collection targets EPR
	Financial support	A2	Flat subsidy for small waste holders	Compensates for the cost of waste management for waste holders.	Encourages waste holders to use legal channels for waste oil collection	BE	Collection targets EPR
	Regulation	A2	Prohibition to charge waste holders a collection fee	Make it mandatory for waste oil collection to offer free collection for waste holders under certain conditions (volume, quality). Collectors may or may not be authorised to pay waste holders.	Encourages waste holders to use legal channels for waste oil collection	FR, ES, PT, IT, HR	Financial support Governance (make sure tendering procedures ensure a profitable collection market overall)

⁴² It could be paid to the waste holders or waste collectors.

⁴³ Financial support does not compensate for net cost of collection in Croatia

Final Report

Solution	Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
	Regulation	A2	Obligation for collectors to provide collection service	<p>Waste oil collectors are obliged to collect from waste holders under certain conditions: distance to their storage facility, minimum volume, maximum delay for collection</p> <p>This can be organised via 2 sub-options:</p> <ul style="list-style-type: none"> - Collectors are registered for a given geographical area and must collect from the entire area, and are free to compete with other collectors registered for the same area (may or may not be combined with an EPR scheme) - Collectors are chosen by geographical area via a tendering procedure 	Obliges collectors to collect in less profitable areas	FR, (Wallonia only), PT BE	EPR Financial support

Final Report

Solution	Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
				(combined with an EPR scheme)			
	Regulation	A3	Mandatory take-back by retailers	Provide convenient service for households and/or small professional waste holders	Encourages waste holders to use legal channels Increases collection rates	DE (for engine oils and waste transmission oils), FR (to be experimented) DE requires all selling points for oil to serve as collection points for waste oil (free of charge)	-
Level of service	Regulation	A3	Enable small waste holders to go to municipal recycling stations	Provide convenient service for households and/or small professional waste holders	Encourages waste holders to use legal channels Increases collection rates	BE, NL, PT, SE, FI, HR, CZ, EE, NO, BG, California, ES foreseen for HU (household) AT (household and household-like) DE provides some municipal collection stations	

Final Report

Solution	Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
	Regulation	A3	Mandatory take-back of contaminated waste oils (for a fee)	Ensure contaminated oil is serviced	Avoid illegal drop-offs	DE requires all selling points for oil to serve as collection points for waste oil (free of charge)	
Legal management	Incentive	A1	Deposit refund schemes	Mandatory deposit refund schemes incentivise waste holders to return their waste oil to an authorised collection point	Encourages waste holders to use legal channels for waste oil collection Increases collection rates	For inland shipping oil on the River Rhine only: NL, BE, FR, DE Hungary has an Environmental Protection Product Charge	
	Enforcement	C4	Controls on waste holders (enforcement)	Conduct environmental police control to check if waste holders manage their waste oils legally. For example, this can be ensured via certificates of disposal (Ireland). A proxy for that is to check waste holders have contracts with waste collectors.	Decrease illegal management	All in principle, but specifically mentioned by BE, FR, HR, EE, LU, IE	

Final Report

Solution	Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
	Monitoring	C5	Ensure mandatory registration of waste holders in a centralised register	Waste holders must register in a centralised registry	Help PRO and public authorities make sure that all waste holders have a contract for collection – help identify illegal practices	PT, AT ⁴⁴	
	Monitoring	C6	Make waste holders keep a record of quantities of waste oils	Waste holders must keep track of quantities generated and their treatment This is accessible to public authorities only in case of control.		LT, NO, ES, HR	
	Monitoring	B7	Mandatory registrations / reporting of quantities by collection point by collectors	Waste collectors must report on the identity of waste holders being collected		PT, AT, ES, FR, HR, BE	
	Monitoring	B8	Ensure traceability by waste collectors	Waste collectors must report collected	Increase knowledge – indirect effect	All in principle Specifically mentioned by	

⁴⁴ The registry is mandatory in all MS according to article 35 of the Waste Framework Directive, with conditions of volume set by MS. This instrument was particularly highlighted by PT and AT as an instrument specifically used to enforce controls related to waste oils, including for small waste holders.

Final Report

Solution	Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
				quantities to PRO or public authorities		FR, ES, PT, EE, BE, etc.	
Transversal – Monitoring collection scheme	Regulation	A1	Collection rate targets	<p>Minimum targets for Member States are calculated based on:</p> <ul style="list-style-type: none"> - The proportion of lubricating oil placed on the market separately collected, or - the proportion of estimated collectable oils separately collected <p>Member States would have to report on the achievement of collection targets to the European Commission on a regular basis.</p>	Improves traceability of waste oil management and incentivises MS to define appropriate measures to achieve targets.	FR, FI, ES, PT, GR, IT, LT, BG, BE, PL (see Table 15 page 92)	
	Governance	A4	EPR (collection + treatment) With sub-options (recommendation/mandatory scope, for example)	<p>Producers are responsible for financing the net cost of separate collection, transport and treatment, accompanied by targets.</p> <p>The scope can vary in a number of ways: only oils generating waste oils</p>	<p>Finances supply-chain deficit in a flexible way (calculation frequently revised)</p> <p>Shifts the administrative</p>	<p>FR, BE, ES, PT, GR, PL, BG, IT, AUS, California</p> <p>DK (voluntary)</p> <p>HU (foreseen)</p> <p>HR</p>	

Final Report

Solution	Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
				<p>or also including lost oils in order to stimulate ecodesign, including brake fluids, vegetable and cooking oil, including oils sold inside products.</p> <p>Sub-options:</p> <ul style="list-style-type: none"> - Mandatory EPR - Recommendation of EPR as a way to ensure free collection for waste holders 	<p>burden of the monitoring from public authorities to the private sector</p> <p>Increases collection and regeneration rates (if supported by related targets)</p>		
	Governance	A2	Voluntary agreement with the industry	Sign a deal with the industry in charge of waste oil management and regeneration with targets	Improve waste collection and treatment	FI	

2.5.3. Quality

The main factor affecting the quality of the collected waste oil appears to be the existence of a **price incentive to ensure quality**:

- Option 1: Waste oil collection is based on the free market. Waste collectors organise themselves with waste holders as part of contractual agreements to charge them for contaminated waste oils to encourage them to sort their waste oils better and to pass on their additional treatment costs.
- Option 2: Regulation guarantees free collection for waste holders. The best policy practice is then to enable waste collectors to charge waste holders for contamination in order to incentivise them to segregate better waste oils, combined with:
 - mandatory quality control procedures. Quality control cost is generally included in the financial support scale as part of EPR schemes.
 - national standards set up either by public authorities or by PROs, under which quality of waste oils waste collectors can charge waste holders. Such standards are not necessary under option 1.

Price incentives can help reduce the most expensive to treat sources of contamination, e.g. PCB. For some contamination sources preventing regeneration but not energy recovery (e.g. brake fluids), the price incentive may not be sufficient to prevent contamination compared with the convenience of mixed collection. Additional policy measures may be necessary:

- precise mandatory segregation practices,
- control of waste holders,
- promotion of good separative collection practices and awareness-raising activities.

Table 11: Policy measures to improve waste oil quality in view of regeneration

Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
Regulation	B1	Minimum quality criteria on collected waste oils to be sent to regeneration	Definition of common quality parameters for waste oils to be authorised to be sent to regeneration It may be integrated into the EPR scheme and managed by the PRO	Informs waste collectors and waste holders of targeted quality	PT, ES, GR, NL ⁴⁵ , FR, HR, BE, DE, FI, HU, PL	
Regulation	B3	Introduce specific criteria to license collectors for waste oil collection	Ensure waste oil collectors have quality control capacity	Encourages waste collectors to control the quality	FR, PT, ES, FI, DE	
Monitoring	B8	Traceability of waste oil quality	Reporting of waste oil type being collected or quality class	Unclear	FR	
Financial instrument	C2	Mandatory charge on the responsible waste holder in the event of contamination	Obligate waste collectors to conduct double sampling at each waste holder. Obligate waste collectors to charge waste holders in the event of contamination (parameters exceeding agreed specifications), including treatment and	Encourages waste holders to pay attention to quality	FR, PT, BE	

⁴⁵ In the Netherlands the scope is different, designating quality criteria for which waste oils must be sent to regeneration <https://lap3.nl/sectorplannen/sectorplannen/afgewerkte-olie/>

Final Report

Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
			collection /storage equipment decontamination cost of waste oil mixed up within the same batch.			
	C3	Recommend collection/segregation practices at the national level (regulation or guidance)	<p>Clarification of the type of waste oils that shall not be mixed to comply with Article 21 of WFD</p> <p>Can be made mandatory or be under the form of guidance</p> <p>Encourage to keep high-risk waste oils segregated from other batches while waiting for quality controls:</p> <ul style="list-style-type: none"> - Insulating oils used in transformers (PCB risk) - Waste oil collected from civic amenity sites - Metal working oils - To a lesser extent, waste oils from garages - 	<p>Encourage waste collectors to inform waste collectors</p> <p>Encourages waste holders to pay attention to quality</p> <p>Reduce the number of cross-contamination events of large batches leading to whole batches being sent to energy recovery</p>	<p>Mandatory: NL (waste management plan), SE (insulating oils),</p> <p>Voluntary: FI</p>	
Regulation	B5	Mandatory quality control by waste collectors	<p>Ensure a minimum level of quality control by waste collectors.</p> <p>Sub-options are:</p>	Incentivise quality improvement in view of regeneration	FR, PT, ES, BE	

Final Report

Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
			<ul style="list-style-type: none"> - Mandatory quality control for each lorry - Mandatory quality control for each batch - Obligation to conduct quality control. No specification as to the organisation 			
Communication	C1	Awareness-raising activities / Training for waste holders	<p>Training to</p> <ul style="list-style-type: none"> - inform on the risk of illegal management - inform on available collection channels - encourage separation of waste oils from waste streams preventing regeneration: <ul style="list-style-type: none"> - Vegetable and cooking oils - Brake fluids - PCB contaminated oils - Fuels/solvents and other fluids - Chlorinated solvents 	Increase awareness of waste holders regarding illegal management and segregation of waste oils	BE, AT, ES, PT, FI, FR, NO, AT, California	

Final Report

Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
			<p>- Water (to some extent)</p> <p>Can be included inside an EPR</p>			
Regulation	B4	Mandatory criteria for civic amenity sites	<p>Make sure civic amenity sites control visually waste oil brought to them to discard emulsions, vegetable and cooking oils. PCB-contaminated oils will be more difficult to discriminate visually.</p> <p>Ensure physical separation of cooking and vegetable oils; and lubricating oils collection points by providing different containers and adequate labelling.</p> <p>Include mandatory information of waste holders regarding accepted waste streams.</p>	Increase the quality of collected waste oils	BE	
Regulation	B9	Ensure (free?) brake fluids collection service	<p>Oblige MS to define a brake oil collection service for garages</p> <p>This can be in or out of the EPR scheme.</p>	Separate collection via garages	PT (upcoming voluntary action from EPR)	

Final Report

Type of policy	N°	Policy measures	Description	Expected effect	Countries already using the measure	Generally combined with
Regulation	B9	Ensure (free?) vegetable and cooking oil collection service	Oblige MS to define a separate collection service This can be in or out of the EPR scheme	Unclear	BE, HR, DE (the requirement for shops to set up collection points), ES (as from 2015) ⁴⁶ (Not necessarily done with the intent to improve waste lubricating oil quality)	

⁴⁶ The new Spanish waste law (Ley 7/2022) also requires mandatory separate collection of used kitchen oils by 31 December 2024.

3. TASK 2: OPTIONS TO INCREASE COLLECTION – FOCUS ON EPR AND COLLECTION SCHEMES

3.1. Screening of the policy measures

The following three tables present the screening of identified policy measures. The approach for the screening is based on the Better Regulation Guidelines (Tool #16). The objective of the screening is to identify the most relevant measures and the level at which the focus of a specific measure should be (EU or MS). After each table, a brief rationale is provided to explain whether a specific measure (or sub-measure) is relevant at the EU level or MS level or not relevant (and the reason for non-relevance). The main screening criteria used are the following:

- **Technical feasibility:** It assesses whether technical constraints could be a barrier to the implementation, monitoring or enforcement of a specific measure.
- **Legal feasibility:** It assesses if a measure is legally feasible, i.e. it is not in conflict with the existing legal framework
- **Political Feasibility:** This means if a specific measure will gain support both at the Commission level and especially from the Member States or the European Parliament during the legislative process.
- **Coherence with other EU policy objectives:** This criterion assesses the coherence of a measure with broader policy objectives, e.g. the Green Deal, Circular Economy Action Plan
- **Previous policy choices:** It assesses if a measure becomes redundant because of previously existing policies and if it would mean reviewing those policy choices
- **Effectiveness (in reaching objectives) low/moderate/high:** This criterion assesses how effective a measure would be in achieving the policy objectives, e.g. increasing collection rate, quality of the collected waste oil
- **Efficiency (cost-benefit balance):** This assesses if the benefits will outweigh the costs and to what extent. At the screening stage, it remains qualitative and can be based on experience with implementing a specific measure in a Member State, for example.
- **Subsidiarity:** Measure at the MS level would be more effective than an EU intervention.

Table 12: Screening of policy measures to increase collection of waste oils

Criterion	A1. Collection rate targets or deposit refund schemes		A2. Incentives and disincentives					A3. New collection approaches			A4. Reinforce Polluter Pays Principle
	A1a. Collection rate targets	A1b. deposit refund schemes	A2a. Market instruments (with or without EPR)		A2b. Commitments, obligations and restrictions			A3. New collection approaches			A4. Reinforce PPP
Obligations/restrictions	1. Collection targets increase with time	2. Establish Deposit refund schemes	1. Subsidy per litre of collected oil	2. Subsidy for small waste holders	3. Forbid to financially charge waste holders for collection	4. Obligation for collectors to provide collection service	5. Voluntary agreement with the industry	1. Small waste holders to go to municipal recycling	2. Mandatory take-back by retailers	3. Mandatory collection of contaminated waste oils (for a fee)	Mandatory EPR (possible sub-options)
Technical feasibility	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Legal feasibility	Yes	Yes but difficult to enforce	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Political Feasibility	Low	Low	Low	Moderate	Moderate	Moderate	High	High	Low	Yes	Moderate
Coherence with other EU policy objectives	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Previous policy choices	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Depends on the legislation/practice on municipal recycling	Yes	Yes	Yes
Effectiveness (in reaching objectives) low/moderate/high	Low	Moderate	Moderate	High	High	Moderate	Low	Moderate	Low	Moderate	High
Efficiency (cost-benefit balance) + (Benefits outweigh costs) or - (Costs outweigh benefits)	+	-	++ for countries with low collection rates	+++	++	++	+	+	+	++	++
Subsidiarity	More relevant for national-level policy action	More relevant for national-level policy action	More relevant for national-level policy action	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (let MS choose the approach)
Conclusion (High priority/Low priority)	High priority Relevant at MS and EU level but lacks consistent statistical information for an EU measure in the short-term	Low priority	Low priority	High priority MS level	High priority MS level	High priority MS level	Low priority MS level	High priority MS level	Low priority	Low priority	Low priority

A1. Collection rate targets or deposit refund schemes

A1.1 Collection targets increasing with time

A measure to define collection targets needs to consider current collection rates. At EU level, the quality of current statistics on collection rates is not robust enough (missing data, lack of consistency across MS) to develop and enforce mandatory targets at the EU level. As several Member States (FR, FI, ES, PT, EL, IT, LT, BG, BE, PL) already have this measure in place, and MS have different collection rates, single EU-wide targets may not be the most efficient due to variable context factors. Two levels of targets could solve this issue, e.g. description of what an "average" and "ambitious" target would be, depending on the starting point of the individual MSs. Until reliable statistics are available, targets could be better implemented at the national level.

A1.2. Deposit-refund schemes incentivise waste holders to return their waste oil, thus increasing collection rates. However, their effectiveness in achieving the objective of the increased collection will vary depending on the financial management system in place (e.g. EPR). However, putting in place such a system has additional costs; thus, its efficiency (benefits/costs) will not be very high. While technically and legally feasible, the political feasibility of these measures would be low because of differences across Member States, in particular, those MSs performing well could be less keen to implement a DRS system.

A2. Market instruments (with or without EPR)

A2.1. Subsidy per litre of collected oil (paid to the collector): this measure could be applied whatever the collection rate but would be more efficient in MS with low collection rates. On the contrary, such a subsidy could have a windfall effect (i.e. irrespective of the subsidy, the waste oil collection will take place or the result is not because of the subsidy so waste of public money) if the waste holder is already collecting well and does not need a financial incentive.

A2.2. Subsidy for small waste holders: it would bring the same effect as A2.1, irrespective of the current collection rate in an MS. It could be a relevant measure as small waste holders, being SMEs, may have insufficient means to ensure appropriate management of their waste oils.

A2.3. Forbid collectors to charge waste holders a fee for collection: used in FR, ES, PT, IT, and HR; it could be interesting to explore their potential at the EU level.

A2.4. Obligation for collectors to provide collection service: used in FR, Wallonia, PT; it could be interesting to explore their potential at the EU level.

A2.5. Voluntary agreement with the industry: despite its success in Finland, its efficiency is not guaranteed in other Member States.

A3. New collection approaches

A3.1. Small waste holders to go to municipal recycling: service for households and/or small professional waste holders (see Table 10). For professionals, municipal recycling stations or contracting with a collector for small volumes could serve as a solution. Several MS have implemented this measure (AT, BE, NL, PT, SE, FI, HR, CZ, EE, NO, BG, foreseen for HU), for different types of sources (household or professional) and it has a great potential to be analysed further. Its effectiveness will depend on how the municipal recycling facilities

handle and, in certain cases, treat these oils and the additional costs it would entail. This measure is a priority at the MS level.

A3.2. Mandatory take-back by retailers: The measure on mandatory take-back by retailers even though it is used in Germany for engine oils and waste transmission oils and is in the process of being tested in France, could result in being less efficient as it does not cover all types of oils, more costly arrangements are needed (e.g. additional storage space), and the retailers may not have the skills to manage collection. Also, the retailers may consider a potential health and safety risk as the employees are not trained in handling hazardous waste.

A3.3. Mandatory collection of contaminated waste oils (for a fee): The measure on the mandatory collection of contaminated waste oils (for a fee) exists in Germany⁴⁷, and its success at the EU level depends on the similarity (or not) of the collection point systems.

A4. Reinforce PPP

This measure ranks high on most criteria, but the effectiveness of an EPR in terms of improving collection will depend on the scope covered (e.g. only lubricating oils generating waste oils or also including lost⁴⁸ oils to stimulate ecodesign, including brake fluids, vegetable and cooking oil, including oils sold inside products, etc.) as well as the way an EPR is implemented (financial system, fees, the role of public authority, etc.). While the EU can suggest general guidelines (as it already does in Article 8a of Directive 2008/98/EC), the implementation of an EPR will vary from one MS to another, as we have seen in the case of other waste streams. Therefore, we suggest this measure as a low priority for the moment.

⁴⁷ Retailers of oils are obliged to establish collection points for waste oils prior to commercial delivery of combustion engine oils or gear oils; Collection points must collect used combustion engine or gear oils free of charge (Waste Oil Ordinance §8 AltöIV).

⁴⁸ Lubricants that do not generate waste oils because they are burnt or leaked in the environment during normal use.

Table 13: Screening of policy measures dealing with the quality of collected waste oils targeting collectors

Criterion	Measures dealing with the quality of collected waste oils targeting collectors								
	B1. EU minimum criteria on collected waste oils to be sent to regeneration	B2. EU encourages cooperation between collectors and regeneration in view of setting minimum quality criteria	B3. Specific criteria to license collectors for waste oil collection	B4. Mandatory collection / segregation practices by waste collectors (e.g. mandatory criteria for civic amenity sites)	B5. Mandatory quality control by waste collectors	B6. Awareness-raising activities / Training for waste oil collectors	B7. Mandatory registrations / reporting of quantities by collection point by collectors	B8. Ensure traceability by waste collectors	B9. Ensure collection of waste streams contaminating waste oils (vegetable and cooking oil and brake fluids)
Technical feasibility	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Legal feasibility	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Political Feasibility	Low	High	Low	Low	Low	Moderate	Low	Low	Low
Coherence with other EU policy objectives	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Previous policy choices	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Effectiveness (in reaching objectives)	Low (different technologies for regeneration)	Moderate	High	Moderate	High	Low (collectors already aware)	Moderate	Moderate	Low

Criterion	Measures dealing with the quality of collected waste oils targeting collectors								
Efficiency (expected cost-benefit balance)	+	++	++	+	- If already good quality, no testing is needed	+	+	+	+
Subsidiarity	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No
Conclusion	Low priority	Low priority	High priority at MS level, Low priority for EU action	Low priority	High priority at MS level	Low priority	Low priority	Low priority	High priority at MS level Low priority for EU action

B1. EU minimum criteria on collected waste oils to be sent to regeneration: Implemented in the EPR systems of several MS as a part of an EPR scheme. This measure implemented alone has limited value as different regeneration technologies are being used in MS, and the acceptance criteria highly depend on the available technology. Therefore, there is no general consensus within the re-refining industry on quantitative acceptance criteria.

B2. EU encourages cooperation between collectors and regeneration in view of setting minimum quality criteria: While this measure has to be implemented by the MS, the EU can act as a catalyst in encouraging such cooperation. Such knowledge exchange can result in a higher rate of regeneration, but as it already exists between stakeholders, it is a low priority for an EU action.

B3. Specific criteria to license collectors for waste oil collection: there are different licensing mechanisms across MS; geographically allocated collectors in France or tender-based financing in Portugal. It would be interesting to explore further possible licencing mechanisms and how they can be used to improve the quality of collected waste oils, mainly at the MS level.

B4. Mandatory collection/segregation practices by waste collectors: Collectors have very different profiles and sizes. Education and awareness-raising activities would be necessary to improve the quality of waste oils as well as an easy, well-functioning and accessible way to test and confirm contamination and quality. Therefore, applying mandatory segregation practices could be challenging to implement.

B5. Mandatory quality control by waste collectors: This measure has been successful in FR, PT, ES, and BE and could be worth exploring further at MS level.

B6. Awareness-raising activities/Training for waste oil collectors: Such awareness-raising activities are best implemented at the national level, and this measure is considered a low priority for an EU level action and not a priority for the assessment at MS level

B7. Mandatory registrations/reporting of quantities by collection point by collectors: Registration and reporting of hazardous waste is already mandatory in the Waste Framework Directive. Several MS already have detailed systems in place, and the registration/reporting systems are specific to the situation in Member States; thus, there is no added value in harmonising.

B8. Ensure traceability by waste collectors: Traceability on hazardous waste collection is already mandatory in the Waste Framework Directive, although implementation and enforcement vary across MS. EPR schemes generally include different policy measures to facilitate traceability and could also be ensured by extending the missions of the competent authorities. No added value on harmonising has been identified.

B9. Ensure collection of waste streams contaminating waste oils (vegetable and cooking oil and brake fluids): Vegetable oil and brake fluid mismanagement pose major problems regarding waste oil quality. Some MS already have separate collection containers for these waste streams, so this measure should be explored further.

Table 14: Screening of policy measures dealing with the quality of collected waste oils targeting waste holders

Criterion	Measures dealing with the quality of collected waste oils targeting <u>waste holders</u>					
	C1. Awareness-raising activities	C2. Waste holder that contaminated the waste oil must pay for the treatment	C3. Establish guidelines that clarify the waste oils that should be kept segregated by the waste holder	C4. Control waste holders (enforcement)	C5. Ensure mandatory registration of waste holders	C6. Make waste holders keep record of quantities of waste oils
Technical feasibility	Yes	Yes	Yes	Yes	Yes	Yes
Legal feasibility	Yes	Yes	Yes	Yes	Yes	Yes
Political Feasibility	Yes	Yes	Moderate	Yes	Yes	Yes

Criterion	Measures dealing with the quality of collected waste oils targeting <u>waste holders</u>					
Coherence with other EU policy objectives	Yes	Yes	Yes	Yes	Yes	Yes
Previous policy choices	Yes	Yes	Yes	Yes	Yes	Yes
Effectiveness (in reaching objectives)	Low	Moderate/High	Low	Low implemented (if alone)	Low implemented (if alone)	Low (if implemented alone)
Efficiency (expected cost-benefit balance)	+	++	+	-	-	-
Subsidiarity	No	Yes	Yes	Yes	Yes	Yes
Conclusion	Low priority	High priority MS level	High priority MS level	Low priority	Low priority	Low priority

C1. Awareness-raising activities: Same as B6

C2. Waste holder that contaminated the waste oil must pay for the treatment: This measure encourages waste holders to pay attention to quality of the collected waste oil and avoid the mixing of different oils and waste streams and is already implemented in DE PT and BE; this is a measure that can only be defined and implemented effectively at the national level (by authorities and/ or in the context of EPR system). Lifting the obligation for waste collectors to provide free collection service can be a good practice to avoid illegal management and ensure that contaminated waste oils are dealt with by professional operators.

C3. Establish guidelines that clarify the waste oils that should be kept segregated by the waste holder: This measure will encourage the waste holders, but its effectiveness is difficult to ascertain as it depends on the uptake of such guidelines. While NL and SE have made them compulsory, in FI, it is voluntary. This measure is studied further at MS level.

C4 (**Control waste holders**), C5 (**Ensure mandatory registration of waste holders**), and C6 (**Make waste holders keep record of quantities of waste oils**) are monitoring measures. Control and reporting of hazardous waste collection is already mandatory in the Waste Framework Directive, although implementation and enforcement vary across MS. Their integration in EPR or other waste oil management approaches could be useful but not as an independent measure.

3.2. Final list of measures

Policy level	Number	Screening code	Measure
EU level	1	A1	Collection targets that increase with time
MS level	2	A2	Subsidy for small waste holders
	3	A2	Prohibition to financially charge waste holders for collection
	4	A2	Obligation for collectors to provide collection service
	5	A3	Small waste holders to go to municipal recycling
	6	B3	Specific criteria to license collectors for waste oil collection
	7	B5	Mandatory quality control by waste collectors
	8	B9	Ensure collection of waste streams contaminating waste oils (vegetable and cooking oil and brake fluids)
	9	C2	Waste holder that contaminated the waste oil must pay for the treatment
	10	C3	Establish guidelines that clarify the waste oils that should be kept segregated by the waste holder / collector

3.3. Baseline

The following figure features the EU-27's waste oil generation forecast up to 2050 based on two different modelling approaches:

- First, based solely on lubricant demand growth forecasts by McKinsey & Company⁴⁹;
- Second, based on lubricant demand growth forecasts by McKinsey & Company⁴⁹, but integrating EU regulatory targets⁵⁰, which aim to decrease Greenhouse Gases Emissions from passenger vehicles and light-commercial vehicles. These will have a downward influence on the consumption of engine oils in the EU.

According to the different estimates, the EU-27 waste oil generation will be between 1.7 and 2 million tonnes in 2050.

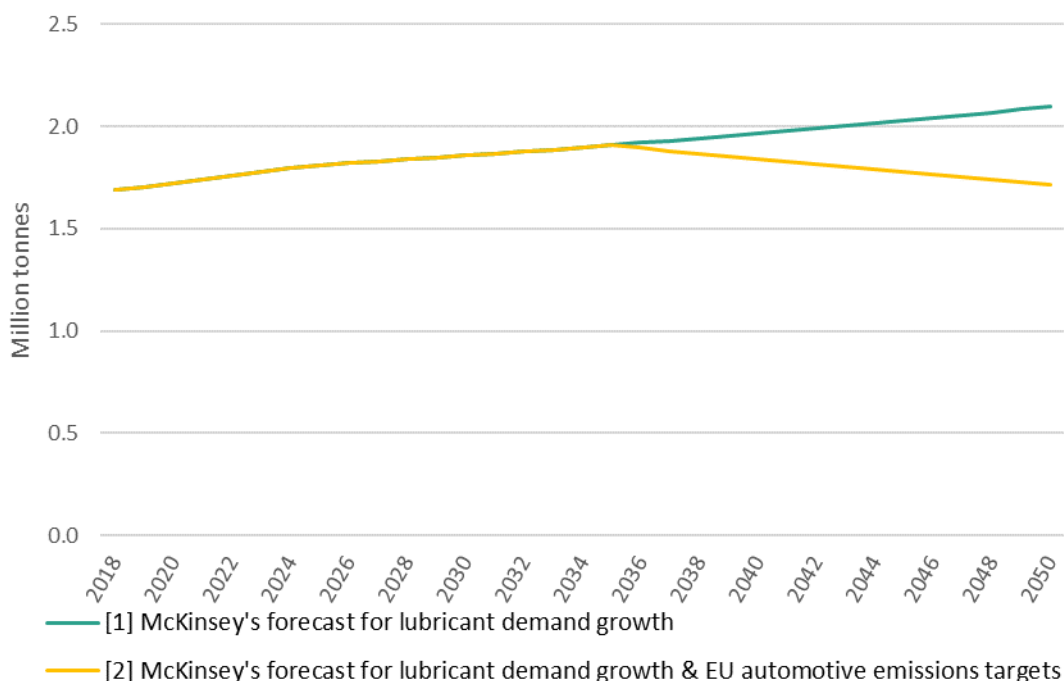


Figure 5: Waste oil generation forecast

The data used for the estimation is detailed in the following section.

A modelling exercise was conducted by RDC Environment based on McKinsey & Company (2018) and Raj Shah et al. (2021)⁵¹. Modelling was shared and discussed with the JRC to be made consistent with the baseline used to assess the impacts of policy measures aiming

⁴⁹ McKinsey & Company (2018). « Lubes growth opportunities remain despite switch to electric vehicles ». Link : [Lubricating oil growth opportunities to 2035 | McKinsey](#)

⁵⁰ COM (2022) 586: Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on type-approval of motor vehicles and engines and of systems, components and separate technical units intended for such vehicles, with respect to their emissions and battery durability (Euro 7) and repealing Regulations (EC) No 715/2007 and (EC) No 595/2009. Link: <https://eur-lex.europa.eu/legal-content/EN/HIS/?uri=COM:2022:586:FIN>

⁵¹ Shah, Raj, et al. "Recent trends in batteries and lubricants for electric vehicles." *Advances in Mechanical Engineering* 13.5 (2021): 16878140211021730.

at increasing the regeneration of waste oils. No intellectual property rights are attached to this modelling.

The two modelling approaches are the following:

- **[1] McKinsey & Company 's forecast for lubricant demand growth**

Future waste oil generation was estimated using the predicted compound annual growth rates of McKinsey & Company's lubricant global demand forecast⁴⁹ for 2035. The growth rates between 2017 and 2035 were applied to the last available waste oil generation data in the EU provided by GEIR⁵². It is assumed that:

- the EU lubricant demand is similar to the world lubricant demand;
- the share of global demand for lubricants by sector is the same as the share of the waste oil generation by sector;
- the McKinsey & Company's forecasts for lubricant demand growth rates for the 2025 and 2035 period are extended to the 2035-2050 period;
- waste oil growth rates are the same as lubricants' demand growth rates.

- **[2] McKinsey's forecast for lubricant demand growth & EU automotive emissions targets.**

This approach is the same as [1] up to 2035's waste oil generation estimate. After that, it is assumed that the waste oil from the automotive sector will decrease gradually from its 2035 level to 32.5 % of the automotive sector's waste oil production in 2050 that was estimated following the first approach [1]. This assumption, that effectively lowers the waste oil forecast according to [1], is made due to EU regulations aiming to ban combustion engine cars from 2035.⁵⁰ The 32.5 % is calculated adding the components explained here bellow.

- By 2050, approximately 25 % of the EU's automotive fleet⁵³ (including the following categories: passenger cars, light commercial vehicles, heavy-duty trucks and buses) would still use significant quantities of lubricants; this includes the following categories:
 - Diesel Conventional;
 - Diesel Hybrid;
 - Diesel plug-in hybrid;
 - Gasoline Conventional;
 - Gasoline Hybrid;

⁵² Data for 2018 reported by the GEIR in Study to support the Commission in gathering structured information and defining reporting obligations on waste oils and other hazardous waste (cf. table 27-4 of the final report). The used data correspond to quantities of "collectable dry" waste oil reported in table 27-4. Collectable dry waste oil is assumed to be the best available waste oil generation proxy.

⁵³ The 25 % is estimated based on the fleet growth forecast carried out in the framework of the Euro 7 impact assessment. The percentage is the weighted average of the share of vehicles still using significant quantities of lubricants per fleet category.

- Gasoline plug-in hybrid;
- Other (gas).
- 7.5 % that is generated by the EU's electric and fuel cell fleet. The EU electric and fuel cell fleet will represent 75 % of the fleet by 2050. The demand for lubricant in the EU electric and fuel cell fleet is assumed to be 10 % of a conventional fleet (diesel, gasoline, hybrid, etc.)⁵⁴

The main limits of this modelling approach are the following:

- In the first modelling approach, the potential decrease in engine oil consumption due to vehicle electrification trends is underestimated for the EU because it does not take into account the relatively more ambitious electrification policy decided by the EU (which is why a second approach is proposed). This tends to overestimate generated waste oils; modelling does not integrate the specificities of the EU industry compared to the world;
- In both modelling approaches, average waste oil emission factor (proportion of lubricant consumption that ends up as waste oil) does not vary with time, for example, due to a change in the proportion of lubricants used by the sector. This tends to underestimate generated waste oils;

This modelling approach is deemed appropriate for the purpose of the present study, which is to estimate the generation of waste oils in the EU to which policy measures focused on collection quantity, collection quality or regeneration will apply.

How would an underestimation/overestimation of generated waste oils affect the assessment of measure 1?

An underestimation/overestimation of generated waste oils entails an underestimation/overestimation of total waste oil collection cost due to measure 1.

The total waste oil collection cost generated by measure 1 depends on the difference between the collection rates and the established collection targets. As a reminder, collection rates are the ratio between collected waste oils and generated waste oils. If generated waste oils are underestimated, collection rates are overestimated. In such a situation, the difference between collected and target collection quantities (i.e., the additional quantities to collect to achieve targets) would be bigger than what was modelled; hence, the total collection cost might be higher than what was modelled.

NB: The assessment of the impacts of Measure 1 is conducted at the 2030 horizon. Therefore, there is no impact of the choice of modelling approach on the quantitative assessment presented in the present report.

⁵⁴ This figure is an assumption of RDC Environment and discussed with the JRC. The assumption is based on the works of Raj Shah (Raj Shah et al. (2020) RECENT ADVANCES ELECTRIFY THE LUBRICATION INDUSTRY) that indicate that electric vehicles and hybrid vehicles will still use some lubricants .

3.4. Quantitative assessment of EU-level policy measures

The following measure is relevant at the EU level. First, a description explains the general principle of the measure. Then, an explanation of how the measure works is provided. The costs of the measure are listed. Finally, the economic, environmental and social impacts of the measure are assessed.

3.4.1. Measure 1: Collection targets that increase with time

Description of the measure

Waste oil collection targets are implemented at a European level and transposed into national legislation. Member States (MS) are requested to achieve an annual waste oil collection rate by a given time frame (e.g., 2030). The rationale behind the time frame is to give enough time to MS that are the further away from the proposed collection targets to implement the necessary means. Supposing targets are set between 2023 and 2025, five years seem to be a reasonable period to implement the necessary means (e.g., an EPR).

How the targets are achieved would be at the discretion of the MS.

Since waste oil collection rates currently vary widely among MS, **two target levels are proposed**:

- by 2030, the collection of waste oil should be increased to a minimum of 80 % by weight, based on generated waste oil quantities, in all MS with a current collection rate below 80 %. Those MS should also meet the target of the high-performing MS in 2035: a collection rate of 95 % (see next bullet point). This would lead to a catching up mechanism.
- by 2030, the collection of waste oil should be increased to a minimum of 95 % by weight, based on generated waste oil quantities, in all MS with a current collection rate between 80 and 95 %.

According to GEIR data, the **EU average collection rate is currently around 80 %**⁵⁵. The first-level target of 80 % would give the opportunity for MS lagging behind to catch up with the EU average. The second-level target of 95 % will incentivise MSs that already have collection rates over 80 % to step up their collection.

Table 15: Legally established collection rate

MS	Estimated collection rate (2018) ⁵⁶	Legally established collection rate (based on generated waste, unless otherwise specified)
	%	Yes or no
Austria	95%	No

⁵⁵ European Commission (2020). Study to support the Commission in gathering structured information and defining of reporting obligations on waste oils and other hazardous waste.

⁵⁶ Data for 2018 reported by the GEIR in Study to support the Commission in gathering structured information and defining reporting obligations on waste oils and other hazardous waste (cf. table 27-4 of the final

MS	Estimated collection rate (2018)⁵⁶	Legally established collection rate (based on generated waste, unless otherwise specified)
	%	Yes or no
Belgium	99%	90% (2020)
Bulgaria	63%	No ⁵⁷
Croatia	93%	No
Cyprus	100%	NA
Czechia	98%	No
Denmark	70%	No
Estonia	57%	No
Finland	79%	No ⁵⁸
France	73%	73.5% ⁵⁹ (2023) 81% (2027)
Germany	100%	
Greece	83%	70% (2020)
Hungary	48%	No
Ireland	100%	
Italy	100%	No The PRO has an internal objective to maintain collection rates at current performance.

report). The used data correspond to quantities of "collectable dry" waste oil reported in table 27-4. Collectable dry waste oil is assumed to be the best available waste oil generation proxy.

⁵⁷ Bulgaria has a 40% recovery target based on quantities placed on the market, which means a minimum 69% collection target based on generated waste, assuming emission factor of 68% (average reference used in France).

⁵⁸ A voluntary agreement (Green Deal) sets the objective to maintain collected quantities at the average level of years 2010-2016: 36 000 t/year

⁵⁹ The target is set at 50% of quantities placed on the market in 2023 and 55% of quantities placed on the market in 2027, for an estimated 68% collectable amount based on quantities placed on the market.

MS	Estimated collection rate (2018)⁵⁶	Legally established collection rate (based on generated waste, unless otherwise specified)
	%	Yes or no
Latvia	100%	
Lithuania	83%	32% (2023) based on PoM 45% (2027) based on PoM
Luxembourg	100%	No
Malta	100%	NA
Netherlands	87%	No
Poland	73%	50% based on PoM
Portugal	96%	100% (2020)
Romania	38%	NA
Slovakia	58%	NA
Slovenia	100%	NA
Spain	82%	95% (2020)
Sweden	89%	No

A 100 % target at EU level seems irrelevant since:

- given the waste oil production dispersal (high distances for collection) and small quantities that some MS have to deal with, some MS might face disproportionate costs and environmental impacts to collect all produced waste oils separately.
- uncertainty related to the waste oil emission factor used to estimate the collectable amount of waste oil makes it relevant to keep a tolerance range in case the collectable amount is overestimated.

Arguments in favour of this policy are:

- The policy directly addresses the overall desired outcome, that is to collect more waste oil.
- The implementation of the specific means to achieve the targets is left to MS who thus have the flexibility to choose between the options most adapted to their national specificities and context.

- Monitoring and reporting are simplified since the key performance indicator of the policy is the annual collection rate, which is directly comparable to the collection targets.

Arguments against this policy:

- Data on waste oil generation is difficult to gather and requires estimation methods based on waste oil emission factors that are often specific to the type of lubricant; the implication of this is that average emissions factors at an EU level will result on an over/under estimation of waste oil production by MS depending on their specific lubricant market.
- The specificities of some MS, such as high dispersion of waste oil production and low waste oil production per collection point, may entail collection costs that are too high to bear; thus, for some MS, reaching the targets may be too costly and there might be some waste oils that will remain uncollected.

How does the measure work?

The target level for MS (80 % or 95 %) is established based on a fixed period of reference and does not change over time. This means that an MS that initially had a collection target of 95 % cannot change its collection target to 80 % if its collection rate falls below 80 %.

By 2030, all MS must achieve their respective collection targets. MS are free to establish the means to achieve these targets.

Collection rates are the ratio of collected waste oil and generated waste oil, **both on a dry basis**. A prerequisite for this is to establish a common European method for estimating generated waste oil based on quantities put on the market and waste oil emission factors as well as a threshold for water content.

Considerations for a common method for estimating generated waste oil:

- Emission factors.

Emission factors correspond to the ratio of generated collectable waste oils and lubricants put on the market. Different types of lubricants produce different amounts of waste oils. Indeed, some categories of lubricants lead to more losses by combustion or leakage in the environment during the use phase. For instance, motor oil is partially⁶⁰ or fully⁶¹ burnt during the use phase; chainsaw oil is partially lost in the environment and formwork oil used in construction cannot be collected separately⁶². In contrast, all hydraulic oils can theoretically be collected at end-of-life⁶³. Common emissions factors for MS are key to guaranteeing comparable collection rates. It should be noted that the European

⁶⁰ 4-stroke engines used in cars, vans ...

⁶¹ 2-stroke engines used in moped and motorcycle, lawnmowers...

⁶² Also called shuttering oil, stays mostly attached to the form and to concrete

⁶³ The circuit is closed-off, with only minor losses during the draining operation

Commission has already established reference values for the calculation of generated waste oil⁶⁴ which can be used by MSs that have not derived their own emission factors.

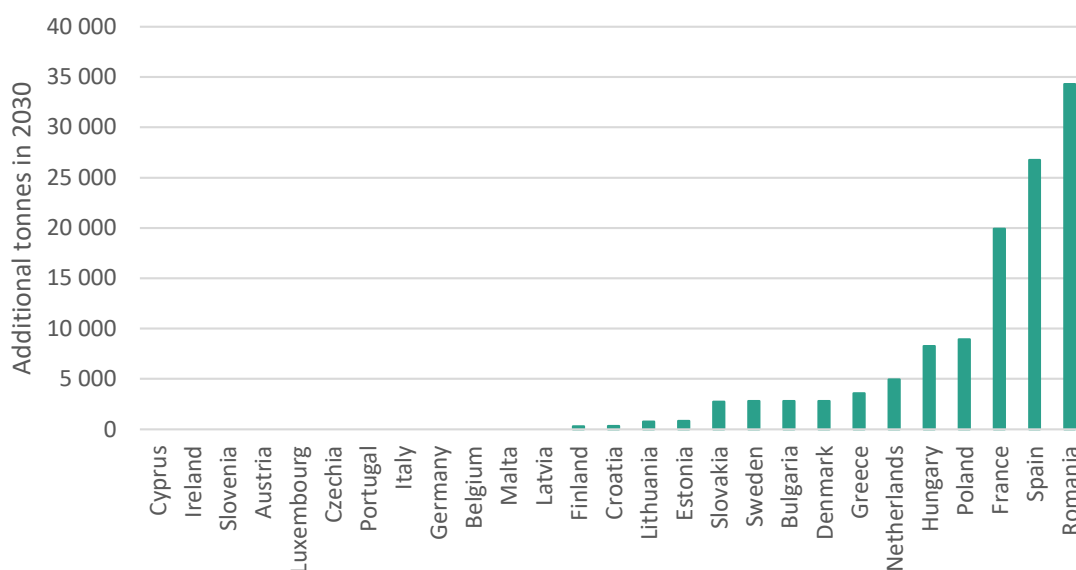
- Water content

Differences in waste oil storage practices within collection points and the type of collected waste oils in each MS may cause a significant variation in the water content of the collected waste oil. The collection rates estimation method must take this into account to enable comparability between the MS's collection rates. Otherwise, a high water content of waste oil will result in an overestimation of collection rates. Hence, collection rates must be estimated on a dry basis. Taking water content into account is already envisaged in Implementing Decision (EU) 2019/1004.

- Single lubricants scope

Emission factors and water content vary depending on the type of lubricant. Hence, the estimation method must consider the same scope of lubricants for generated waste oils and collected waste oils for all MS. It should be noted that the European Commission has already established a list of waste oils⁶⁴ to be reported by the MS based on the European Waste Codes.

The supplementary quantities of waste oil that need to be collected in 2030 to achieve the targets per MS are presented in the following figure⁶⁵. At EU level, around 120 kt of additional waste oil would have to be collected to reach targets by 2030. The target to be reached by each MS depends on the 2018's collection rate of each MS (80 % or 95 %). Targets per MS and the supplementary quantities of waste oil that need to be collected are also presented in more detail in appendix 8.8 (cf. **Table 40** and **Table 41**)



⁶⁴ Cf. Guidance for the compilation and reporting of data on the placing on the market of mineral and synthetic lubrication and industrial oils and on the treatment of waste oils as required by the Commission Implementing Decision (EU) 2019/1004, Annex VI.

⁶⁵ Modelling approaches do not diverge until 2035, therefore the estimation does not vary between baseline modelling approaches.

Figure 6: additional waste oil to be collected by MS by 2030 to reach targets

In addition, for those MS that started with an 80% target, given their initial collection rate (see "Description of the measure" in this section), the additional quantities of waste oil that need to be collected in 2035 to reach the 95% target is about 94 kt of additional waste oil.

What would be the costs of the measure?

The total cost of the measure arises from the following factors.

- The additional quantities of waste oil that must be collected to achieve waste collection targets for each MS entail additional collection costs. These costs arise from infrastructure, equipment (mainly trucks), staff and administrative tasks and operations needed for
 - transport from;
 - collection points and intermediate storage facility
 - intermediate storage facility to treatment facility
 - intermediate storage;
 - analysis and quality control.
- The increase/decrease of the average collection cost per tonne. There are two opposite effects:
 - increased collection distances, which entails an upward pressure on cost per tonne since trucks have to be driven for more hours and longer distances (this effect will have a higher impact on regions presenting higher population dispersion; hence MS could prioritise regions to reach the collection targets in order to not penalise the most remote regions) ;
 - more collected waste oil per day, which pushes cost per tonne down since trucks charging capacity is higher (total cost is reduced in proportion to the additional collected waste oil since cost per tonne is a function of total cost divided by collected quantity)⁶⁶;
- The deployment of national mechanisms to achieve targets (e.g. an EPR scheme).

Economic impacts

The additional⁶⁷ cost to achieve proposed collection targets would be **around 15 million euros per year**. This amount corresponds to the additional cost of collecting waste oils missing to achieve targets (i.e., the difference between the targeted collection and the current collection rate). MSs which do not present any cost in **Figure 7** already have a collection rate of 95% or higher. **Figure 7** shows the additional gross collection cost of

⁶⁶ Cf. appendix 8.7 **Error! Reference source not found.** for more information on collection costs.

⁶⁷ Additional compared with business-as-usual cost, considering current collection rates (cf. Table 20) in 2030 in the absence of public policy.

achieving collection targets per MS, that is 80 % or 95 % depending on the MS 2018's collection rate (cf. **Table 40** for detail on the targets per MS).

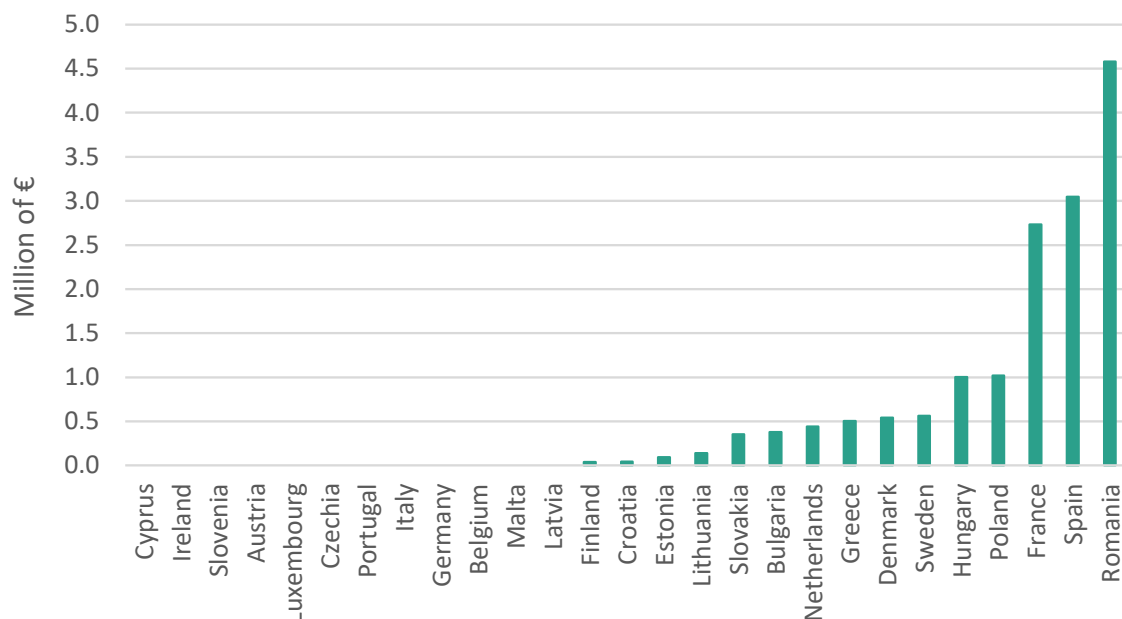


Figure 7: Total gross collection cost of the measure by MS

In addition, for those MS that started with an 80% target, given their initial collection rate (see "Description of the measure" in this section), the additional costs of waste oil collection to reach the 95% target by 2035 will be around **12 million euros per year**.

Estimates of collection cost per tonne and the description of the collection cost model used to estimate economic impacts are presented in appendix 8.7 and 8.8.

In addition, the cost of an EPR that could lead to reaching those targets is estimated to be around **3 million euros per year**. This cost will be supported by those who place lubricants on the market, who may choose to pass the cost on to consumers or to cut their own margins. No additional cost is considered for MS that already have an EPR system or are already compliant with targets. It is worth noting that establishing an EPR is not a prerequisite for reaching high collection rates as other systems are possible, including free-marked based systems. Nevertheless, public authorities and companies (waste holders, collection companies...) would also face additional costs to meet necessary conditions for good collection performances (e.g., financial support).

The benefits of collection targets and of EPR on regeneration are not assessed in this study as this is done by the study done by the JRC. It should be noted that the EPR may have beneficial effects on aspects such as illegal practices and awareness-raising.

EPR administrative costs for the eight MS that would implement an EPR (since they do not have one and are not in compliance with the targets) are presented in appendix 8.8, in Table 43.

Environmental impacts

The environmental impact of the additional transport is assessed. The transport is made up of two stages:

- Collection of waste oil at the producers of the waste oil, the collected waste oil is sent to an intermediate storage facility,

- Transport of waste oil from intermediate storage to the treatment facility.

At the intermediate storage, a pre-treatment of the waste oil is carried out to rid the waste oil of its water content and other impurities (typically a decanting step). With an average decanting factor of 10.6%⁶⁸, for every tonne of waste oil that is received by the treatment plant, a total of 1.12⁶⁹ tonnes of waste oil is collected during the first transport stage.

The main environmental impact of transport is the emission of greenhouse gases; this is, therefore, the only impact category assessed here. The following parameters are used to model this impact:

Parameter	Transport intermediate storage to	Transport from intermediate storage to the treatment facility
Capacity lorry (t)	14	24
Distance roundtrip (km)	Country-specific ⁷⁰	300
Loading rate (%)	76	50
GHG emission factor (kg CO2/t*km)	0.117	0.119

The loading rate during the first transport leg is the average value found in Europe, based on interviews⁶⁸. For the second transport leg, we assume that the lorry is at full capacity (100%) on the outward trip and completely empty (0%) during the return trip. This gives an average 50% loading rate over the total roundtrip distance of 300 km. The GHG emissions are taken from the COPERT⁷¹ model, taking into account the loading rate of the lorry.

For each country, the impact due to the transport of one tonne of waste oil is calculated and then multiplied by the total collected waste oil by 2030 (see Figure 6). The results are presented in Figure 8.

⁶⁸ Background data collection for waste oil treatment, Ifeu & RDC Environment, 2021

⁶⁹ $1 / (1 - 0.106) = 1.12$

⁷⁰ See **Table 36** in Annex, this distance is calculated as the lorry driving use (h/day) multiplied with an average speed of 40 km/h

⁷¹ Developed by Leonidas Ntziachristios and Zissis Samaras (Laboratory of Applied Thermodynamics, Aristotle University of Thessaloniki, Greece)

COPERT 5 is a software tool used world-wide to calculate air pollutant and greenhouse gas emissions from road transport. The development of COPERT is coordinated by the European Environment Agency (EEA), in the framework of the activities of the European Topic Centre for Air Pollution and Climate Change Mitigation. The European Commission's Joint Research Centre manages the scientific development of the model. COPERT has been developed for official road transport emission inventory preparation in EEA member countries. However, it is applicable to all relevant research, scientific and academic applications.

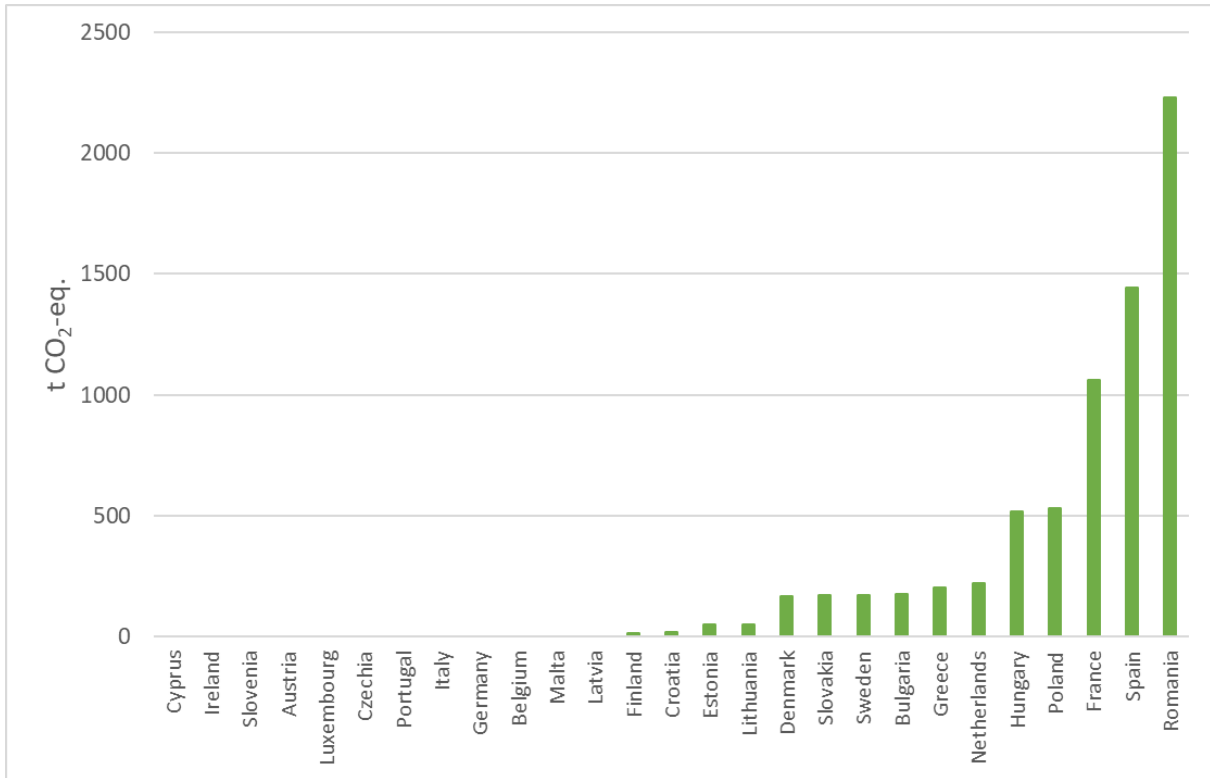


Figure 8: total GHG emissions per year (in 2030) due to additional transport of collected waste oil

Social impacts

Considering the baseline collection rates (cf. **Table 40**) and the respective collection targets (80 % or 95 %), the total collection employment for achieving the targets in 2030 **would be around 69 FTE-year**. This number corresponds to the additional jobs needed to collect the waste oils missing to achieve targets (i.e., the difference between the targeted collection and the baseline collection rate). No additional jobs are considered for MS presenting collection rates of 95 % or higher. **Figure 9** shows the number of additional collection jobs needed to achieve collection targets per MS. As a reminder, the target level for each MS (cf. appendix 8.8 in **Table 40**) depend on their 2018’s collection rate. The reasons for having two target levels (80 % and 95 %) are developed in the first paragraph of section 3.4.1.

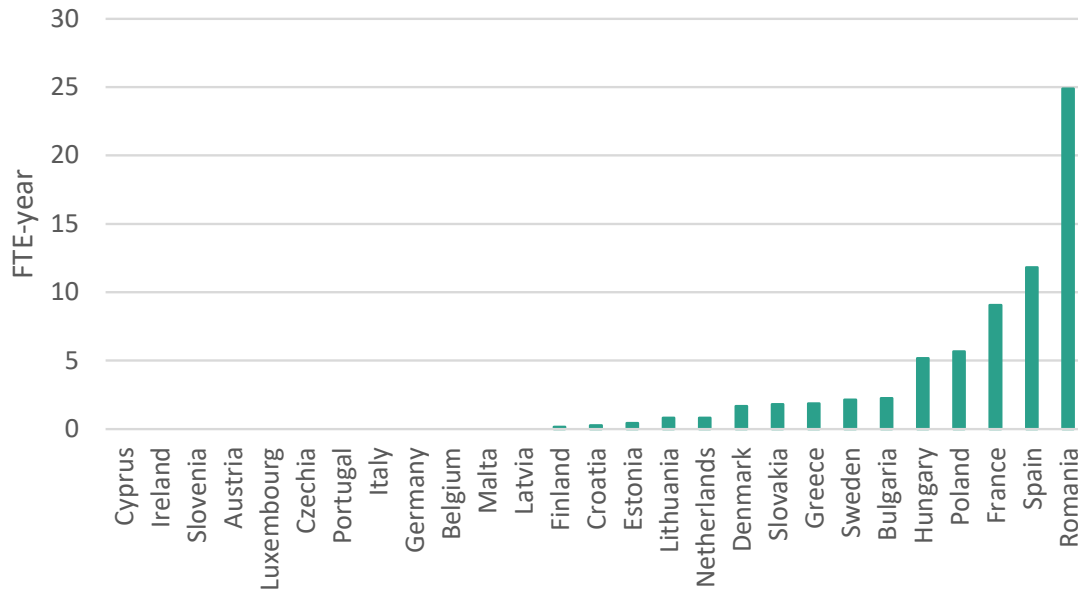


Figure 9 : additional collection jobs need for achieving collection targets per MS

In addition, for those MS that started with an 80% target, given their initial collection rate (see "Description of the measure" in this section), the total collection employment for achieving the targets in 2035 would be around 52 FTE-year.

Data used to estimate the additional jobs are presented in Appendix 8.8.

3.5. Qualitative assessment of MS-level policy measures

The following measures are relevant at the Member State level. The collection target measure (measure 1) is relevant for all Member States. The relevance of the other measures depends on the current situation and characteristics of the Member States. Firstly, a description explains the general principle of the measure and then an explanation of how the measure works is provided. The costs of the proposed measures are listed below. Finally, the economic, environmental and social impacts of the measure are assessed qualitatively.

3.5.1. Measure 2: Subsidy for small waste holders

Description of the measure

Approved small waste holders receive a flat rate annual subsidy upon request to cover the collection cost they usually face. The aim of the measure is to foster the collection of waste oils from small waste oil producers for which the risk of illegal practices is higher because they often have to pay for the waste oil collection while other larger volume waste generators have their waste oil collected for free or get remunerated by collectors. The flat rate subsidy does not interfere with market mechanisms for price formation.

This measure is already applied in Belgium via the EPR scheme.

How does the measure work?

Two parameters have to be defined in each Member State to design the measure:

- Annual waste oil production threshold under which the subsidy applies.

In each Member State, there is a threshold of produced waste oil quantity per year under which the waste holder has to pay for the waste oil collection instead of getting paid or being collected for free.

- Amounts of the flat rate subsidy per waste oil production volume range.

The amount depends on the collection cost for the small waste holder per range of waste oil volume generated and the extent of the cost coverage.

These two parameters should be revised regularly as the collection cost faced by small waste holders evolves with crude oil prices. Therefore, a revision of the volume ranges and the amount of subsidies for each range should be envisaged every year. This can be done via an annual study/survey or simply based on the crude oil price evolution.

In Belgium, the PRO carries out a yearly survey every December to estimate the price charged for collection. This survey is addressed to collectors and garages. The result of this survey allows the PRO to set the flat rate subsidy for the next year.

This measure is particularly cost-efficient because it targets specific waste holders at risk of illegal practices and not all waste holders.

For example, in Belgium, three annual waste oil production categories with a specific flat rate subsidy are defined in 2022:

- from 0 to 5,499 litres per year: 115 € per year
- from 5,500 to 7,499 litres per year: 150 € per year

- from 7,500 to 9,999 litres per year: 200 € per year

This measure is potentially relevant for all Member States as waste holders with a small waste oil production quantity are present in all Member States (e.g. small garages). However, it is less relevant:

- if the majority of waste holders are eligible to receive a flat rate subsidy. This is because the administrative cost of a subsidy to waste holders is higher than that of a subsidy to waste collectors (more recipients);
- if there are large geographical collection price variations. The flat rate subsidy is an average per annual waste oil production quantity and does not encompass the diversity of transport distances for waste oil collection.

The prohibition to mix waste oils with other waste streams may be an eligibility criterion in order to encourage waste holders to comply with this rule when applicable or relevant. Additional quality criteria, such as maximum water content, can further encourage an increase in the quality of waste oils.

The measure should be accompanied by a communication plan so that small waste holders are aware that they can request the flat rate subsidy.

The administrative cost for waste holders should be reduced as far as possible so that it does not discourage subsidy requests, for example, by using convenient or digital means for subsidy request. In Belgium, approved collectors are in charge of forwarding the contact details of eligible waste holders and to declare volume ranges. Waste holders receive a letter annually with a unique code allowing them to connect to the PRO website to receive payment.

What would be the costs of the measure?

The main direct economic cost of the measure would be the flat rate subsidy (see above).

This subsidy could be financed in several ways:

- Public authorities (e.g. via a tax on lubricants put on the market)
- An EPR system

The flat rate subsidy would lead to an increase in the collection and treatment of waste oils.

What are the costs and benefits of the measure?

The measure is expected to lead to a significant increase in the collection rate and a drop of illegal collection and treatment practices. For instance, in Belgium, the collection rate rose from 96% in 2008 (EPR was launched in 2007) to 100% in 2019. The rise could be more significant in MS that have lower collection rates / a larger proportion of waste holders paying for waste oils collection.

Table 16: Impacts of measure 2 - subsidy for small waste holders

	Costs	Benefits
Economic impacts	<ul style="list-style-type: none"> • Cost of the waste oil collection, transport and treatment • Administrative cost for waste holders and collectors to request subsidy 	<ul style="list-style-type: none"> • Increased revenue for waste collectors and treatment operators
Environmental impacts	<ul style="list-style-type: none"> • Environmental impact of the transport 	<ul style="list-style-type: none"> • Avoided illegal management of waste oils • Environmental benefits of the waste oil treatment (avoided virgin oil production if regeneration or avoided fossil fuels if energy valorisation)
Social impacts	-	<ul style="list-style-type: none"> • Job creation for the waste oil collection, transport and treatment

3.5.2. Measure 3: Prohibition to financially charge waste holders for collection

Description of the measure

This measure implies that the waste collector may not charge the waste holder for collection. Two systems are possible:

- The collection is always free for the waste holder;
- The waste holder can be paid for the collection;

The aim of the measure is to foster the collection of waste oils from small or remote waste oil producers for which the risk of illegal practices is high because they usually have to pay for the waste oil collection.

This measure is already applied in France, Hungary, Italy, Portugal and Spain.

How does the measure work?

Conditions for the collection to be free should be defined:

- Minimal volume

Collecting small volumes frequently increases the level of service for the waste holder, but the smaller the volume, the higher the (net) collection cost per tonne that needs to be

financially supported. A minimal volume under which collection may be charged to the waste holder has to be defined to incentivise the waste holder to increase its storage capacities to reduce the collection costs and increase the efficiency of waste oil collection.

- Quality requirements

The quality requirements should incentivise the waste holder to avoid contamination of waste oil. If the waste oil is contaminated, collectors should be allowed to charge waste collectors for the true waste oil collection and treatment cost entailed (collection, disposal of collected waste oil as well as decontamination and disposal cost of contaminated batches).

This measure has to be implemented in combination with a financial support system which ensures that collectors are financially supported for the net cost of collection. The financial support system may be part of an EPR scheme or taken from the budget of competent authorities.

This measure may be combined with an obligation for collectors to provide collection service (Measure 4). This measure cannot be combined with a subsidy for small waste holders (Measure 3).

This measure is relevant for all Member States as remote waste holders or waste holders with a small waste oil production quantity are present in all Member States (e.g. small garages).

What would be the costs of the measure?

This measure entails no direct cost.

Indirectly, this measure requires collectors to be financially supported via an EPR scheme or a public subsidy to compensate collectors for the net cost of collection from non-profitable waste holders (small or remote areas).

What are the costs and benefits of the measure?

The measure will lead to a large increased collection and treatment of waste oils and a decrease in illegal waste management.

Table 17: Impacts of measure 3 - Interdiction to financially charge waste holders for collection

	Costs	Benefits
Economic impacts	<ul style="list-style-type: none"> • Cost of waste oil collection, transport and treatment financed by a financial support system • Administrative cost of the EPR system / public subsidy, if not already existing 	<ul style="list-style-type: none"> • Increased revenue for waste collectors and treatment operators

	Costs	Benefits
Environmental impacts	<ul style="list-style-type: none"> Environmental impact of the transport 	<ul style="list-style-type: none"> Avoided illegal management of waste oils Environmental benefits of the waste oil treatment (avoided virgin oil production if regeneration or avoided fossil fuels if energy valorisation)
Social impacts	-	<ul style="list-style-type: none"> Job creation for the waste oil collection, transport and treatment

3.5.3. Measure 4: Obligation for collectors to provide collection service

Description of the measure

Waste oil collectors are obliged to collect from waste holders under certain conditions:

- Maximum distance to their storage facility;
- minimum volume;
- maximum delay for collection.

The aim is to oblige collectors to collect in less profitable areas (remote areas, small waste oil producers, etc.) so that all waste holders are offered a service.

This measure is already applied in Belgium (Wallonia only), France and Portugal.

How does the measure work?

This can be organised via 2 sub-options:

- Collectors are registered for a given geographical area and must collect from the entire area, and are free to compete with other collectors registered for the same area (may or may not be combined with an EPR scheme);
- Collectors are chosen by geographical area via a tendering procedure (combined with an EPR scheme).

The different thresholds have to be defined according to the MS specificities and a collection cost-efficiency trade-off:

- Maximum distance to their storage facility so that waste oil transport distance remains limited;
- Minimum volume

- Maximum delay for collection

Waste oil collectors should be allowed to collect outside their mandatory area, but this may take place without financial support from EPR in case a tendering procedure has been organised.

This measure is relevant for MS with remote areas (islands, areas leading to long transport distances and or with a small waste oil production).

This measure may be applied in multiple situations, whether or not the collection is offered for free, and with or without financial support from an EPR scheme or from State.

What would be the costs of the measure?

Taken alone, this measure increases collection costs and reduces collection operators' profit margin. It must be accompanied by other measures.

If this measure is associated with a prohibition to financially charge waste holders (Measure 3, as is the case in France, Portugal, Italy and Spain), it should be associated with a financial support system for waste collectors and/or for regeneration.

Table 18: Financial support scheme for waste collectors and regeneration facilities

	Financial support	Scope
Portugal	185 EUR/t (2019)	Collection + Pre-treatment, excl. waste oils sales price ⁷²
Italy	46 EUR/t (2018)	Collection only
	227 EUR/t (2018)	Collection + regeneration
Spain	10 EUR/t (2019)	Collection only
	124 EUR/t (2019)	Collection + regeneration
Greece	26 EUR/t (2019)	Storage and quality control
France	Confidential	-

NB: Support to regeneration facilities has been included in this table because it influences the entire value chain of waste oils and prices for waste collection services. Therefore it also contributes to make free waste oil collection possible. If this measure is implemented in a market with free-price design for collection (as is the case in Belgium), it forces waste collectors to build a service offer for less profitable markets, but the additional cost is passed on to waste holders. Waste holders should be financially supported to make this cost affordable (Measure 2).

What are the costs and benefits of the measure?

⁷² The Portuguese PRO buys out waste oils from collectors and sells them to treatment facilities. This transaction has been excluded from the value presented here to present the net financial support of the PRO for collection and pre-treatment.

The measure will lead to a medium increased collection and treatment of waste oils and, importantly, to a decrease in illegal waste management.

Table 19: Impacts of measure 4: Obligation for collectors to provide collection service

	Costs	Benefits
Economic impacts	<ul style="list-style-type: none"> • Cost of the waste oil collection, transport and treatment • Administrative cost of the EPR system / public subsidy, if not already existing 	<ul style="list-style-type: none"> • Increased revenue for waste collectors and treatment operators
Environmental impacts	<ul style="list-style-type: none"> • Environmental impact of the transport 	<ul style="list-style-type: none"> • Avoided illegal management of waste oils • Environmental benefits of the waste oil treatment (avoided virgin oil production if regeneration or avoided fossil fuels if energy valorisation)
Social impacts	-	<ul style="list-style-type: none"> • Job creation for the waste oil collection, transport and treatment

3.5.4. Measure 5: Small waste holders are allowed to go to municipal recycling station (civic amenity site)

Description of the measure

This measure provides a convenient service for small waste oil producers (households or professional waste holders with small waste oil production).

The aim is to encourage those small waste holders to use a legal collection channel and to avoid an expensive collection cost per tonne due to the small quantity to justify a dedicated turn. It leads, therefore, to an increased waste oil collection.

This measure is already applied in many MS (AT, BE, BG, CZ, ES, DE, FI, HR, NL, PT, SE, FR). Some MS only accept household waste holders.

How does the measure work?

The following criteria have to be defined:

- Type of waste holder and possible identification

Households who drain their own cars should be able to bring waste oils to municipal recycling stations. Professional waste holders may also be accepted under certain conditions (maximum quantity, financing). The identification of the waste holder would enable to define a maximum quantity that can be brought per year. Without an identification system, it would still be possible to restrict the quantity that is brought per visit.

- Maximum quantity

To limit this possibility to small waste holders, a maximum quantity of waste oil has to be defined. This can be done either per year if the waste holder is identified or per visit to the municipal recycling stations. Defining thresholds is often a competence of local authorities.

Table 20: Example of acceptance conditions in a few local authorities

Member State	Local authority	Threshold	Conditions
Belgium	BEP Environnement (Namur)	Container < 20 l	Professional waste holders are not allowed
France	Quimper	Waste are accepted under the condition that they are brought in light vehicles (cars, cars with a trailer, or light utility vehicle with payload <3.5t) and can be discharged by the user itself.	Professional waste holders are allowed under the same conditions
France	Lyon	< 8 kg /day for household hazardous and toxic waste including waste oils	Professional waste holders are allowed. Light utility vehicles have to pay by access and have limited access (4 times a month)
Spain	Madrid ⁷³	< 5l (mobile), < 10 l (fixed) civic amenity site.	Refers to motor oil from vehicles.

- Financing

There are three possibilities to finance this measure by providing the small waste holders incentives to avoid illegal waste management practices:

- Financing from local authorities (rise of local taxes on waste)
- Financing of additional cost from the State budget (that can be combined with a tax on lubricants put on the market). This support would typically need to go through local authorities in charge of civic amenity sites, and in some cases to be transferred to private operators operating the sites.
- EPR system

⁷³ [Ropa y Aceite usados - Ayuntamiento de Madrid](#)

Making the waste holder pay would reduce the efficiency of the measure as small waste holders would not be incentivised to bring the waste oil to the municipal recycling station, and illegal waste management practices may remain.

Professional waste holders may be asked to pay for:

- Waste oil collection (in bulk or inside the packaging)
- Supervision of deposits and quality control: waste cooking oil, brake fluids

Depending on the distribution of competences inside each Member State, waste oils acceptance and pricing criteria should be defined at MS level, regional/provincial level, or local level, following some general principles to be defined by national competent authorities.

This measure is relevant for all MS as waste holders with a small waste oil production quantity are present in all MS. It is particularly relevant for:

- MS, where a significant proportion of households drain their own car;
- Professionals, if there is no obligation for collectors to provide a service already (Measure 4).

What would be the costs of the measure?

In 2019, the cost of waste oil collection and treatment from civic amenity sites was 430 €/t in Belgium⁷⁴ (i.e. cost of civic amenity infrastructure and operations allocated to waste oils, including quality control, and cost of waste oils collection and treatment by specialised waste management operators).

What are the costs and benefits of the measure?

The measure will lead to a small increased collection and treatment of waste oils and a decrease in illegal waste management as this measure focuses on very small waste oil producers.

This measure may degrade the quality of collected waste oil if there is no supervision of how the waste oils are disposed of in the CAS. This risk can be mitigated by improving waste container labelling and signalling inside civic amenity sites and by providing similar and adequate service for other waste streams which risk being disposed of together (cooking oil, brake fluids) so as to discourage mixing.

Table 21: Impacts of measure 5 - Small waste holders to go to municipal recycling station

	Costs	Benefits
Economic impacts	<ul style="list-style-type: none"> • Cost of the waste oil collection, transport and treatment • Cost of the EPR system if not already 	<ul style="list-style-type: none"> • Increased revenue for waste collectors and treatment operators

⁷⁴ ADEME (2021) European review of extended producer responsibility (EPR) schemes for lubricants

	Costs	Benefits
	existing and if applied via EPR	
Environmental impacts	<ul style="list-style-type: none"> Environmental impact of the transport 	<ul style="list-style-type: none"> Avoided illegal management of waste oils Environmental benefits of the waste oil treatment (avoided virgin oil production if regeneration or avoided fossil fuels if energy valorisation)
Social impacts	-	<ul style="list-style-type: none"> Job creation for the waste oil collection, transport and treatment

3.5.5. Measure 6: Specific criteria to license collectors for waste oil collection

Description of the measure

This measure ensures that waste oil collectors comply with minimal conditions to be authorised to collect waste oils. Minimal conditions can include:

- The obligation to provide a service on a specific geographical area around storage capacities (Measure 4);
- The existence of storage and quality control capacity;
- The obligation to conduct minimal sampling and quality control operations (Measure 7).

This measure can be applied with or without an EPR.

This measure is already applied in Germany, France, Finland, Portugal and Spain.

How does the measure work?

Article 17 of the Waste Framework Directive provides that "*Member States shall take the necessary action to ensure that the production, collection and transportation of hazardous waste, as well as its storage and treatment, are carried out in conditions providing protection for the environment and human health in order to meet the provisions of Article 13, including action to ensure traceability from production to final destination and control of hazardous waste in order to meet the requirements of Articles 35 and 36*". Additionally, following article 26 of the Waste Framework Directive, professional waste collectors must be registered.

Member States can specify conditions that apply to hazardous waste collectors. They can request that waste oil collectors obtain a license/permit to be allowed to collect waste. Compared with a combination of separate obligations such as Measure 4 and Measure 7, this Measure enables Member States to clarify the list of approved collectors. Waste holders are made responsible for operating only with approved collectors.

This measure proposes to define at least the following conditions:

- The existence of storage and quality control capacity (storage tanks, personnel trained to sample, own or sub-contracted testing capacity, etc);
- A double-sampling procedure for each batch collected, one being stored by the waste holder (or the collector if the collector is not in charge of storage), the other by the collector in charge of storage. The objective is to identify the waste holder(s) / collector(s) in charge of contamination once the contamination is identified on a mixed batch at storage;
- The issuing of a tracking slip for each batch to trace waste oil movements (following articles 17 and 35 of the Waste Framework Directive);
- If combined with measure 7, minimal analytical parameters to be controlled (PCB, hydrocarbons and glycols being the most sensitive parameters);

Member States must define competent authorities to award these licenses, which are usually competent authorities for environmental permits.

This measure is relevant for MS who have significant waste oil quality issues (which can be suggested by low regeneration rates) and/or significant black market collection (which can be suggested by low collection rates).

What would be the costs of the measure?

This measure entails an administrative cost for waste oil collectors and public authorities.

What are the costs and benefits of the measure?

Table 22: Impacts of measure 6 – specific criteria to license collectors

	Costs	Benefits
Economic impacts	<ul style="list-style-type: none"> • Administrative cost for the licensing procedure (collectors, public authorities) 	<ul style="list-style-type: none"> • Economic benefits due to the increase in regeneration and decrease in the incineration of waste oils
Environmental impacts		<ul style="list-style-type: none"> • Environmental benefits of more regeneration and less waste incineration
Social impacts		<ul style="list-style-type: none"> • Job creation for the quality controls

3.5.6. Measure 7: Mandatory quality control by waste collectors

Description of the measure

Mandatory quality control by waste collectors would improve the quality of collected waste oils. It would provide incentives for waste holders to avoid contamination of waste oils given they would be charged for the treatment of the contaminated waste they provide. The identification of waste holders at high risk of contamination would enable waste collectors to avoid mixing waste oils of different qualities and, therefore, foster regeneration.

This measure should be combined with Measure 9 "Waste holder that contaminated the waste oil must pay for the treatment".

This measure can be applied via an EPR but also via national regulations.

Unlike Measure 6, this measure is not associated with a licensing procedure. It must be enforced separately.

This measure is already applied in Belgium, France, Portugal and Spain.

How does the measure work?

The following criteria have to be defined:

- Control points
- Control frequency
- Chemical / physical parameters to control
- Contaminant thresholds enabling the collector to charge waste holders for collection (Measure 9).

There are several possible **control points** to organise mandatory quality controls.

- Batch

Double sampling should be taken, one staying with the waste holder, and the other with the collector.

A batch level control is relevant when combined with lorry quality control: if lorry-based control shows contamination, batch control helps to identify which waste holder was responsible for the contamination and to charge them with the cost (cf. Measure 9).

- Collection lorry

Lorry-based quality control is cost-efficient compared to quality control per batch, but it happens too late to prevent the complete load in the lorry from being contaminated, and it does not allow to identify the waste holder(s) that is the source of the contamination.

- After pre-treatment, if any

Pre-treatment reduces sediment and water level in view of regeneration.

Quality control can be used to check the quality of pre-treated batches before sending them to regeneration (or energy recovery).

- Waste holder

Waste oil quality could be controlled at the waste holder level, on stored batch samples, with a frequency depending on activities (activities, waste management practices, etc.), to improve knowledge of sources of contamination and target communication campaigns.

The number of control points per complete collection and treatment operation, and the frequency of control, must be decided based on a trade-off between control costs and quality improvement that is specific to:

- MS. Countries with lower efficiency of law enforcement and large illegal activities may require more frequent control / more control points;
- Companies. Some waste-holder activities, such as civic amenity sites or garages, are at higher contamination risk and may require to be controlled more frequently.

This measure should also specify which quality parameters should be controlled. PCB, hydrocarbons and glycols are priority criteria as they often prevent regeneration. Sediments, water and chlorine are also recommended, as regeneration facilities usually have tolerance ranges for these parameters.

This measure is relevant for all MS as there are risks of the contamination of waste oil in all MS.

What would be the costs of the measure?

The main cost of the measure itself (without taking indirect impacts into account) would be the labour cost to sample waste and store samples and laboratory costs to test the waste oil quality. Typical analytical cost per sample is of around 130 €⁷⁵.

What are the costs and benefits of the measure?

This measure would lead to more waste oils being regenerated and less waste oil being incinerated.

Table 23: Impacts of measure 7 – mandatory quality control by waste collectors

	Costs	Benefits
Economic impacts	<ul style="list-style-type: none"> • Laboratory costs for the quality control • Labour cost for sampling and sample storage 	<ul style="list-style-type: none"> • Economic benefits due to the increase in regeneration and decrease in the incineration of waste oils
Environmental impacts	-	<ul style="list-style-type: none"> • Environmental benefits of more regeneration and less waste incineration

⁷⁵ Source: collection company interviews.

Social impacts	-	<ul style="list-style-type: none"> • Job creation for the quality controls
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3.5.7. Measure 8: Ensure separate collection of waste streams contaminating waste oils (vegetable and cooking oil and brake fluids)

Description of the measure

The measure aims to reduce waste lubricating oil contaminations via the collection of waste streams which frequently contaminate waste lubricating oils: vegetable and cooking oil and brake fluids.

This measure could be applied with an EPR scheme (as part of the EPR scheme for lubricants or as a dedicated scheme), but not necessarily.

This measure is already applied in Belgium, Croatia and Germany⁷⁶ for waste cooking oils (the requirement for shops to set up collection points). These MS set up cooking oil collection schemes without the intention to improve waste lubricating oil quality.

The Portuguese EPR for waste lubricating oils has planned to start a collection program for brake fluids in 2023 by providing separate collection drums to waste holders.

How does the measure work?

This measure aims to offer a convenient service to waste holders of waste cooking oils and brake fluids to avoid them mixing these waste with waste lubricating oils.

For brake fluids, the waste collection should be organised by order of priority:

- From garages;
- From professionals who drain their own vehicles (public works, farmers, airports if not already organised);
- In civic amenity sites, for households who drain their own car.

Waste brake fluids are produced in very small volumes in comparison with lubricants. For instance, they represent 0,3% of the lubricant, greases and brake fluids market in France⁷⁷. Draining a car produces limited volume (0.25-0.5L, compared to appr. 5L for lubricating oil). It happens less frequently (every 20 to 50 000 km vs every 10 to 20 000 km), which hardly justifies a dedicated trip to the civic amenity site or a dedicated collector. The organisation of a collection service must take this data into account so that the collection scheme is really convenient to avoid mixing practices while remaining cost-efficient. An on-demand collection could be envisaged.

Brake fluid collection at civic amenity sites may be organised at a nominal cost if brake fluids can be placed inside their containers in the premises used to collect hazardous waste.

⁷⁶ And it will be for kitchen oils in Spain from 2025.

⁷⁷ Source: CPL, 2019. In France, the lubricant market observation includes lubricants, greases and brake fluids.

Adequate service should be conceived in collaboration garages to optimise logistics (adequate drum size, frequency and possible collection with other waste streams).

Brake fluids can be regenerated⁷⁸. The opportunity to keep them separate from other hazardous fluids could be examined.

For waste cooking oil, the waste collection can be organised via specific deposit locations, bring points (like glass or paper) or in civic amenity sites. Professional waste cooking oil producers (restaurants) may also be targeted, but this will not have an influence on waste lubricating oil quality as these holders do not generate significant waste lubricating oil volumes.

New collection schemes should be accompanied by improved container labelling for waste lubricating oil, cooking oil and brake fluids; better signalling and personnel training at civic amenity sites; and potentially with communication campaigns and supervised deposit at civic amenity sites. The objective is to raise waste holders' awareness (especially households) regarding the distinct nature of these waste streams that should not be mixed.

Collection schemes may be organised inside or outside an EPR scheme.

- Brake fluids may be included in a potential EPR scheme for lubricants (similar producers and waste holders, similar treatment processes). Brake fluid producers already pay EPR fees in Spain and Portugal, but without dedicated collection systems (although envisaged in Portugal).
- Cooking oils are unlikely to be included in an EPR scheme for lubricants (different producers, waste holders, and end treatment routes).

This measure is relevant for all MS as there are risks of contamination of waste oil in all MS.

What would be the costs of the measure?

The main cost of this measure will be the cost of separate collection and logistics and personnel costs if deposit at civic amenity sites is systematically supervised.

Additional administrative costs arise if an EPR scheme is chosen (traceability, reporting), which may be justified if it helps improve collection performance.

What are the costs and benefits of the measure?

Table 24: Impacts of measure 8 – ensure separate collection of waste streams contaminating waste oils

	Costs	Benefits
Economic impacts	<ul style="list-style-type: none"> • Cost of cooking oil collection (separate containers and logistical cost) • Cost of brake fluids collection (separate containers for garages) 	<ul style="list-style-type: none"> • Benefits of biodiesel production (fossil diesel substitution) • Benefits of brake fluid regeneration (virgin brake fluid substitution)

⁷⁸ Example of brake fluid regeneration operator in Belgium: <https://proviron.com/brake-fluid-recycling/>

Environmental impacts	<ul style="list-style-type: none"> • Impacts of separate collection, transport and treatment 	<ul style="list-style-type: none"> • Environmental benefits of more regeneration of waste lubricating oils due to lower contamination • Environmental benefits of more regeneration / fuel preparation and less waste incineration
Social impacts		<ul style="list-style-type: none"> • Job creation for collection, transport and treatment

3.5.8. Measure 9: Waste holder that contaminated the waste oil must pay for the full induced cost of treatment

Description of the measure

This measure would incentivise waste holders to pay attention to their waste quality by the fact that they would have to pay for the full induced waste management cost if the waste oil is contaminated.

This measure should be combined with Measure 7 “Mandatory quality control by waste collectors”.

This measure can be applied via an EPR or via national regulations.

This measure is already applied in Belgium, France and Portugal.

How does the measure work?

Waste collectors should identify the waste holder responsible for the contamination of a lorry/storage tank by testing all samples corresponding to batches assembled in the lorry or storage tank. The measure forces waste collectors to bill waste holders responsible for contamination for the full induced cost of contamination.

The full induced waste management cost should encompass at least the treatment cost of the total quantity of waste oil that was contaminated by the batch (e.g., hazardous waste incineration cost for waste oils that were collected in the same lorry than PCB contaminated waste oils), and may also include additional lorry or storage tank decontamination/cleaning cost and administrative cost for the most severe contamination (e.g., PCB), or financial penalties to discourage contamination.

Three parameters could be defined contractually:

- The quality specifications

Quality specifications above which waste holders are asked to pay should be defined by the collector depending on the targeted regeneration facilities and agreed prior to collection by the waste holder. Depending on the regeneration facilities, quality specifications may vary. They are regeneration facility-specific and not MS-specific.

- The maximum batch size for which cost could be covered: lorry or storage tank capacity, depending on quality control operations. The waste holder should not be asked to pay for contamination that should have been detected by the collector.
- The scope of cost to be covered. For some quality parameters (e.g., water, sediments), contamination reduces the economic value of collected waste oils but does not prevent regeneration; for others (e.g., chlorine, glycols), it prevents regeneration only if contamination can not be diluted inside the storage tank; for PCB, it prevents any form of recovery and induces decontamination costs. Collectors may be allowed to fine penalties to discourage contamination and support the contamination management cost (dilution, quality control, etc.).

There is a risk of illegal waste management practices with this measure as waste holders may want to avoid legal collection cost if they suspect contaminations in their waste oils. Controls of public authorities with adequate fines are required with this measure, especially in MS with companies less sensitive to environmental issues. Awareness-raising activities can also help prevent contamination at the source (cf. Measure 10).

This measure is particularly relevant for all MS that introduced a form of public financial support to waste collection, as contamination of waste oil may not be reflected in price construction. In countries where price construction is fully market-based, one might think this measure is less relevant because collection operators already have a financial interest in identifying waste holders responsible for contamination insofar as reflected in the treatment cost. However, if contamination prevents regeneration but does not lead to higher costs (because energy recovery is cheaper), it may be an opportunity for waste collectors to save treatment costs while remaining compliant with article 21 of the Waste Framework Directive (priority to regeneration). Therefore, this measure is potentially relevant for all MS, with or without EPR or another form of financial support.

What would be the costs of the measure?

This measure leads to a transfer of cost from waste collectors to waste holders.

The main net cost of this measure is administrative cost (contracting, billing, etc.). It is, therefore limited.

Indirectly, this measure :

- would generate additional quality control costs, as discussed in Measure 4;
- would increase the proportion of waste oil sent to regeneration, which, depending on the context, leads to higher treatment cost (if regeneration is more expensive than fuel preparation, for instance) or lower treatment cost (if regeneration is cheaper than alternatives; it is always the case when compared with hazardous waste incineration).

What are the costs and benefits of the measure?

This measure would lead to more waste oils being regenerated and less waste oil being incinerated. There is also a risk of increased illegal waste management practices.

Table 25: Impacts of measure 9 - waste holder that contaminated waste oils must pay

	Costs	Benefits
--	-------	----------

Economic impacts	<ul style="list-style-type: none"> • Administrative cost (contracting, billing) • Cost of increased regeneration and decreased incineration of waste oil (context-dependant) 	<ul style="list-style-type: none"> • Economic benefits due to the increased regeneration and decreased incineration of waste oils (context-dependant)
Environmental impacts	<ul style="list-style-type: none"> • Risk of increased illegal waste management practices 	<ul style="list-style-type: none"> • Environmental benefits of more regeneration and less waste incineration
Social impacts	-	-

3.5.9. Measure 10: Establish guidelines that clarify the waste oils that should be kept segregated by the waste holder/collector

Description of the measure

The guidelines would clarify the type of waste oils that should not be mixed to comply with Article 21 of the Waste Framework Directive. It would encourage waste collectors to keep waste oils at high risk of contamination segregated from other batches while waiting for quality controls.

This measure is already applied in Finland.

The Netherlands and Sweden have established lists of waste oils that shall be kept segregated. However, they are not mere guidelines but they are made mandatory by law (in the Netherlands, via a waste management plan, and in Sweden for insulating oils).

How does the measure work?

This measure requires setting up a working group to define which types of waste oil should be kept separated at the source (by the waste holder) and after collection (by the waste collector). The working group should be composed of representatives of waste holders, collectors, regeneration operators, and potentially PROs. This work would preferably be conducted at EU level for waste oils that cause quality issues in all MS (i.e. insulating oils, cooking oils). However, specificities of waste oil treatment processes could lead to an additional layer of guidelines in some MS (e.g. brake fluids cause more or less issues depending on MS).

The objective of these guidelines is to reduce the risk of cross-contamination of waste oils by raising awareness about sources of contamination. Indeed, this study has shown that:

- sorting instructions (e.g., not mixing brake fluids) are not yet clear or applied by waste holders;
- sources of contamination are not yet fully identified by waste collectors. Drafting guidelines could help in sharing knowledge about sources of contamination and good practices to avoid them (keeping certain sources of waste oils separate as far as possible).

Guidelines will need to define:

- sorting instructions for waste holders, e.g., requirement to keep brake fluids separate, recommendation to keep transformer oil⁷⁹ separate from other lubricating oil or to have them diagnosed for PCB;
- best segregation practices for waste collectors e.g., keeping waste lubricating oil from airports or from civic amenity sites separate.

This measure is relevant for all MS as there are risks of contamination of waste oil in all MS. This measure is complementary to measure 9 in order to help waste holders reduce their financial penalties.

In a simplified version of such guidelines, waste holders should be made aware of the availability of different waste collection containers to ensure practical application.

What would be the costs of the measure?

The cost of the measure itself would be composed of:

- Marketing cost to distribute and communicate about the guidelines (websites, leaflets, articles in professional journals);
- Personnel cost to discuss and draft the guidelines.

What are the costs and benefits of the measure?

The impact of the measure would be uncertain and limited.

Table 26: Impacts of measure 10 – establish quality guidelines

	Costs	Benefits
Economic impacts	<ul style="list-style-type: none"> • Personnel cost – people required to draft and comment on guidelines • Marketing cost to distribute and communicate about the guidelines (websites, leaflets, articles in professional journals) • Cost of increased regeneration and decreased incineration of waste oil (context-dependant) 	<ul style="list-style-type: none"> • Economic benefits due to the increased regeneration and decreased incineration of waste oils (context-dependant)

⁷⁹ Also called insulating oil

Final Report

Environmental impacts	-	<ul style="list-style-type: none">• Environmental benefits of more regeneration and less waste incineration
Social impacts	-	-

3.5.10. Summary of the qualitative assessment of MS-level policy measures

The table below summarises the qualitative assessment of MS-level policy measures.

The summary takes the following criteria into account:

- Collected quantity

Does the measure increase the collected quantity of waste oils? To increase the collected quantity is the focus of the analysis of this report.

- Waste oil quality

Does the measure improve the waste oil quality? Improving the waste oil quality could lead to more waste oil being regenerated. Therefore, it is also an objective of the selected policy measures.

- Risk of illegal waste management practices

Does the measure impact illegal waste management practices? Policy measures may also impact the risk of illegal waste management practices. Policy measures with an incentive to increase collection (e.g. measures leading to a lower price for waste holders) will reduce the risk of illegal practices, but policy measures focussing on quality control with a price incentive will increase the risk of illegal waste management practices.

- MS relevance

Is the measure relevant for all MS or only for MS with specific conditions? Some measures are relevant for all MS while other are only relevant in specific contexts (e.g. geographical situation).

- Combinations of policy measures

Should some policy measures be combined? Some measures could/should be combined to increase their impact. The combination could also only be relevant for MS in specific situations (see MS relevance criterion).

Table 27: Summary of the qualitative assessment of MS-level policy measures

Measure number	Measure	Collected quantity	Waste oil quality	Risk of illegal waste management practises	MS typology relevance	Have to be combined with EPR or financial support to collectors ⁸⁰	To be combined with	Not compatible with
2	Subsidy for small waste holders	+++	NA	--	All MS	No		3-5 ⁸¹
3	Interdiction to financially charge waste holders for collection	+++	NA	---	All MS	Yes	4	
4	Obligation for collectors to provide collection service	++	NA	--	MS with remote areas	Yes	3-6	
5	Small waste holders to go to municipal recycling	+	NA	-	All MS	No		
6	Specific criteria to license collectors for waste oil collection	++	++	-	All MS	No	4-7	

⁸⁰ All measures can be combined with EPR

⁸¹ Subsidy for small waste holders should not address those waste holders that can go to civic amenity sites for free. Both subsidy and acceptance at civic amenity sites can be combined if they address different categories of small holders (typically subsidy for professional holders and acceptance at civic amenity sites for households), or if they address professionals that are asked to pay to visit civic amenity sites.

Final Report

Measure number	Measure	Collected quantity	Waste oil quality	Risk of illegal waste management practises	MS typology relevance	Have to be combined with EPR or financial support to collectors ⁸⁰	To be combined with	Not compatible with
7	Mandatory quality control by waste collectors	NA	++	+	All MS	No	9	
8	Ensure collection of waste streams contaminating waste oils (vegetable and cooking oil and brake fluids)	NA	++	NA	All MS	No		
9	Waste holders that contaminated the waste oil must pay for the treatment	NA	+++	++	All MS	No	7	
10	Establish guidelines that clarify the waste oils that should be kept segregated by the waste holder	NA	+	NA	All MS	No		

+: small increase; ++: medium increase; +++ large increase; -: small decrease; --: medium decrease; ---: large decrease.

NA: non-applicable

4. TASK 3: OIL DATA STATISTICAL ANALYSIS AND SUPPORT TO POSSIBLY REVIEW THE WFD

This section provides a summary analysis of data provided by Eurostat in September 2022 as a result of reporting as required in line with Commission Implementing Decision (EU) 2019/1004 laying down rules for the calculation, verification and reporting of data on waste in accordance with Directive 2008/98/EC . Data covers a range of subjects related to the quantity of lubricants placed on the market, waste oils collected and their treatment in the EU Member States.

Due to the limited data received from Member States and the fact that data were collected in 2022 for the first time – deadline 30 June, the analysis does not allow for a representative comparison between Member States nor the identification of trends in the time series. Consequently, this analysis provides only an illustrative comparison.

Limitations of this dataset are summarised around three major aspects:

- Limited sample size – not all the Member States have provided relevant data.
- Limited time series – only 2020 reporting.
- Limited reliability and robustness – some of the data received presented unreasonably high or low values. To ensure the robustness of the data, cross-checks were performed, by benchmarking the data received with data available on the same variable in the same or a similar time frame (e.g. by referring to Oeko-Institute⁸² data). The datasets that revealed strong inconsistencies, were consequently excluded from the analysis.

The section is structured along the following parts, providing statistics on quantity, quantity per person and where relevant internal processing vs. export of:

- **Section 4.1** – Lubricants placed on the market;
- **Section 4.2** – Collection of waste oil;
- **Section 4.3** – Treatment of waste oil.

Annexes: Overview of available granular data (see Sections 8.9 and 8.10).

⁸² Oeko-Institut *Study: Study to support the Commission in gathering structured information and defining of reporting obligations on waste oils and other hazardous waste, 2020*, available at: <https://op.europa.eu/en/publication-detail/-/publication/73a728bc-72f5-11ea-a07e-01aa75ed71a1/language-en>.

4.1. Lubricants Placed on the Market (PoM)

This section provides an overview of the quantities of lubricants placed on the market. Data for this analysis is not available for all countries. Hence, CZ, EL, IT, CY, MT, PL, RO, IS, LI are not covered in the analysis due to missing data.

Figures on PoM are not fully reliable in each case. Based on the cross-check performed with Oeko-Institute data⁸³ on consumption (used as a proxy), some data were considered unreliable. Data on placing on the market of oils where PoM for a given country is more than 50% higher or lower than reported lubricants and waste oil consumption data⁸⁴ are considered unreliable, and related countries are excluded from the analysis. Based on this assumption, the following countries are excluded from the analysis: DE, IE, LU, SI, FI, and SE⁸⁵.

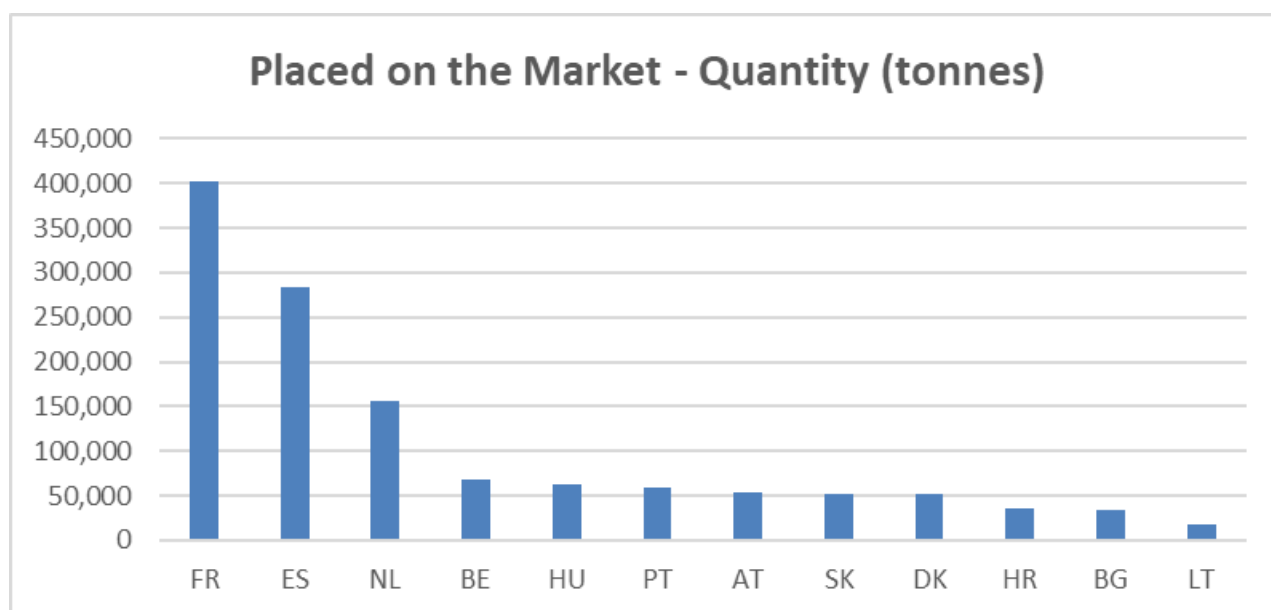


Figure 10: Placed on the Market – quantity (tonnes)

Source: MS reporting (2020)

When looking at Figure 10, it can be observed that the quantity placed on the market increases in proportion to the countries' population, as demonstrated by the extremely high correlation between the two variables, as shown in the figure below.

⁸³ Oeko-Institut Study: Study to support the Commission in gathering structured information and defining of reporting obligations on waste oils and other hazardous waste, 2020, available at: <https://op.europa.eu/en/publication-detail/-/publication/73a728bc-72f5-11ea-a07e-01aa75ed71a1/language-en>.

⁸⁴ Ibid.

⁸⁵ It is possible that for some of the countries above (IE, FI, SE), the difference with previous data comes from differences in reporting of data for lubricants used for ships and boats. However, in the absence of further evidence, it is not possible to adjust data to take this possibility into account.

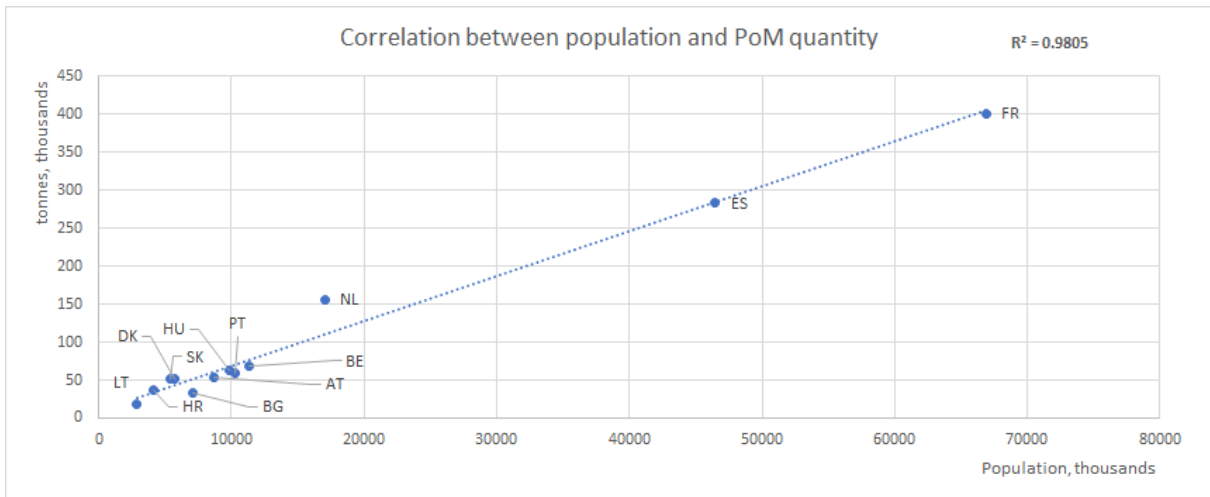


Figure 11: Correlation between quantity Placed on the Market and population

Within this framework, based on the data provided, two different clusters of countries can still be identified, one with quantities placed on the market ranging between 8 and 10 kg/capita and the other one ranging between 5.5 and 6.5 kg/capita. Only Bulgaria represents an outlier, with significantly lower figures.

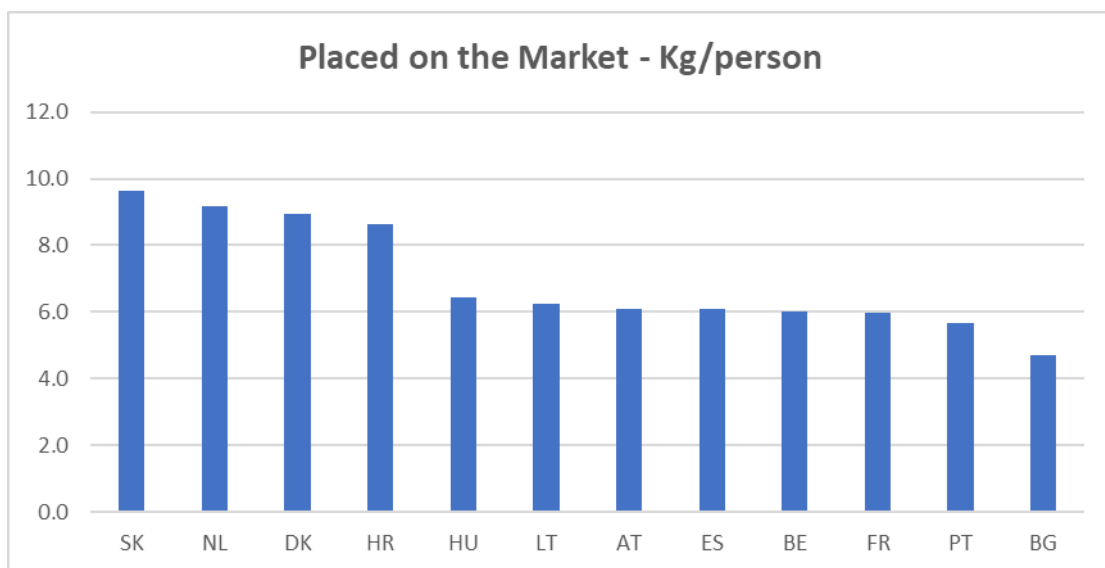


Figure 12: Placed on the Market – kg/per person

Source: MS reporting (2020)

When analysing the amount of lubricants placed on the market per capita (Figure 12), it seems that the Member States with the highest amount of lubricants placed on the market per capita include those with a relatively smaller population.

In addition, data from MS reporting provided by Eurostat also provides granular information on the share of the waste oil categories as placed on the market (engine and gearbox, industrial, industrial emulsion, and concentrates). This dataset was reviewed, cleaned up and is provided in Annexes for more details (see Appendix 8.6). Although PoM figures for SK, NL, EE, HR, HU, BE and BG do not vary more than 50% compared to

reference from Oeko-Institute Report⁸⁶ used for cross-checking, they should be considered with caution due to out-of-range shares of lubricants PoM by category when compared with the reference from Oeko-Institute Report (difference being between 9% to 23% depending on the case). Consequently, this could result in overestimation/underestimation of certain categories of lubricants.

⁸⁶ Op.cit. Oeko-Institut 2020.

4.2. Collection of waste oil

This section provides an overview of the quantities of waste oil collected. Data for this analysis is not available for all countries. Hence, EL, IT, CY, MT, PL, RO, are not covered in the analysis due to missing data.

Figures on the collection volumes might not be reliable in each case. Based on the cross-check performed with Oeko-Institute data⁸⁷ (used as a proxy), some data were considered unreliable. The volume of collected data where the waste oil collection volume for a given country is equal to, or more than 50% higher or lower than the previously reported collection data are considered unreliable. Based on this assumption, the following countries are excluded from the analysis CZ, EE, IE, HR, HU, and SK. The volumes analysed under this section refer to volumes reported on a dry weight basis.

The data set provided on the collection of waste oil is not fully reliable (Figure 15), as the collection rate is calculated based on the share of the collected oil and PoM. Hence, countries whose data was considered unreliable under PoM analysis should be excluded from the analysis of the collection rate. In addition to CZ, EE, IE, HR, HU, and SK, as mentioned above, countries such as DE, LV, LU, SI, FI, and SE need to be excluded from the collection rate analysis.

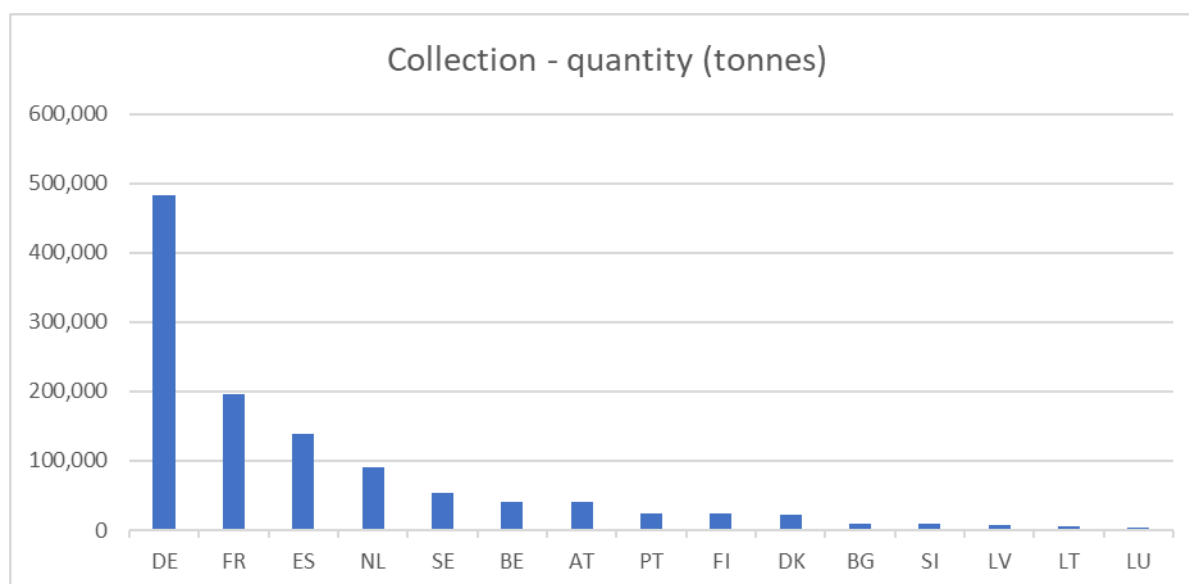


Figure 13: Collection of waste oil – quantity (tonnes)

Source: MS Reporting(2020)

The data set presented in Figure 13 indicates that countries with a more mature approach and long-standing legislative framework to the collection of waste oils have more reliable data. For instance, ES, for several years, have established a relatively well-functioning extended producers responsibility (EPR) scheme for waste oil, while DE has a successful non-EPR waste oil management system.

When analysing the quantity of collected waste oil per capita (Figure 14), no major trends related to Member State typology of type of collection schemes for waste oils can be observed given the limited availability and reliability of data.

⁸⁷ Ibid.

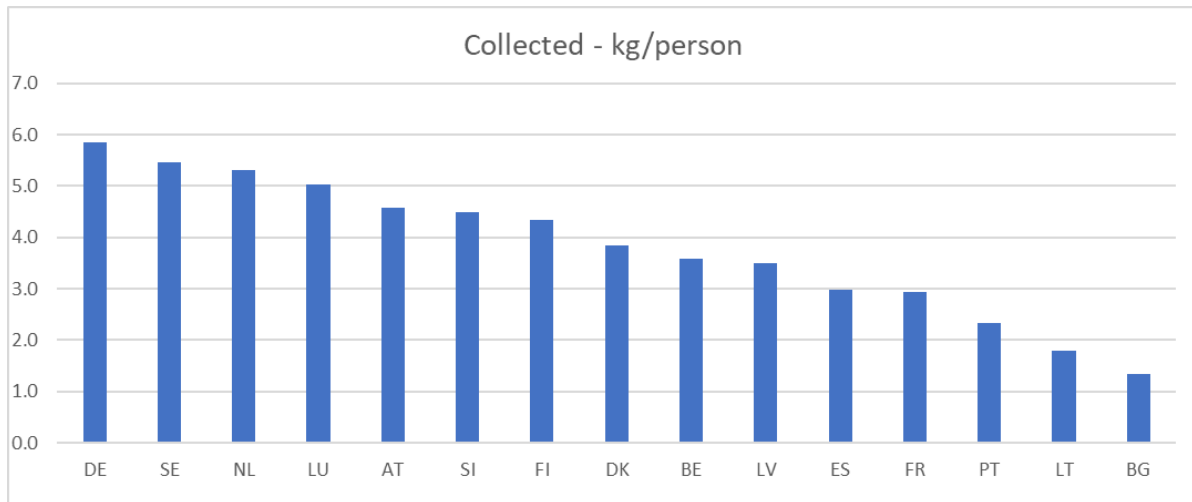


Figure 14: Collection of waste oil per capita

Source: MS Reporting(2020)

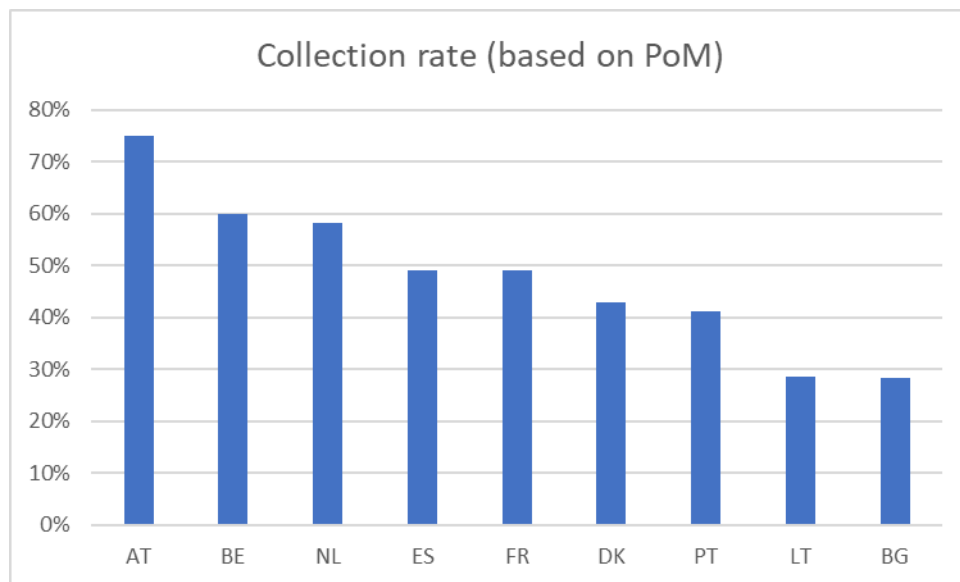


Figure 15: Collection rate of waste oil (based on the PoM data set)

Source: MS Reporting(2020)

Figure 15 aims at illustrating the collection rate of waste oil. However, when analysing this dataset, it should be noted that the collection rate of waste oil cannot reach 100%. This is due to lubricant losses during its life cycle (e.g. engine oil burned during use, chain saw oil lost in the environment etc.). Hence, the maximum collection rate achievable by individual Member States depends on the share of each application in quantities PoM⁸⁸.

Collection rates for BE, NL, DK, and BG should be interpreted with caution due to out-of-range proportions of lubricants PoM by category. This may question the reliability of PoM data, which in turn affects collection rates. Additionally, no data is available on the categories of waste oil for which collected quantities are reported (only waste engine oils,

⁸⁸ For instance, with regards to application it could be noted more losses for engine oil are counted than for industrial lubricants.

only waste industrial oils or both) and whether these are coherent with PoM data. Inconsistent data would affect the reliability of the collection rates calculated.

For example, NL estimates that 100% of lubricants PoM are engine lubricants, with no industrial lubricants being reported as PoM. On the contrary, FR and ES specify that 30-41% of PoM are industrial lubricants. The latter data set seems to be more reliable. The collection rate figure in the NL could either be overestimated or underestimated depending on the scope of collected quantities, which is unknown, and its coherence with categories of lubricants reported as PoM:

- If collection and PoM figures both refer to engine oils only, collection rates may be underestimated compared to average waste lubricating oil collection rates (in case industrial oil were also accounted). This is because engine oil losses during use are higher than those for industrial oil.
- If collection figures cover all waste lubricating oil (including waste industrial oil) while PoM figures refer to engine oils only, collection rates may be overestimated because the quantities PoM are underestimated by neglecting industrial oils.

Due to the limited availability of data on the collection rate and limited information about the scope of reported data, no major conclusions can be drawn from the data set provided. It can be assumed that the countries covered by this analysis have a relatively mature system with a regulatory approach establishing an effective framework for waste oil collection.

4.3. Treatment

This section provides an overview of the treatment of collected, imported and or exported waste oil within each country. Data for this analysis is not available for all countries. Hence, EL, IT, CY, LU, MT, PL, and RO are not covered in the analysis due to missing data.

Figures on the reported volume of treated waste oils are not reliable for all countries, following cross-checking of the sum of the waste oils treated within the country⁸⁹ with the sum of the collected and imported waste oils when excluding export in the data set from the 2020 Member States’ reporting. The volume of treated waste oil is considered as not reliable where the volume of treated waste oils for a given country is equal to or more than 50% higher, or lower, than reported collection + import - export. Based on this cross-check, the following countries are excluded from the analysis: BG and SI.

Where data is available, the dataset provides quantities of waste oil allocated by treatment. However, the data availability is limited for exports and imports. Therefore, the analysis of the quantities of waste oils per treatment when assessing the macro trends of exported and/or imported waste oil is limited. Figure 16 below compares countries’ share of waste oil quantities treated internally and the share of waste oil quantities exported. On the basis of these examples, it is possible to determine which countries have significant regeneration facilities and which do not.

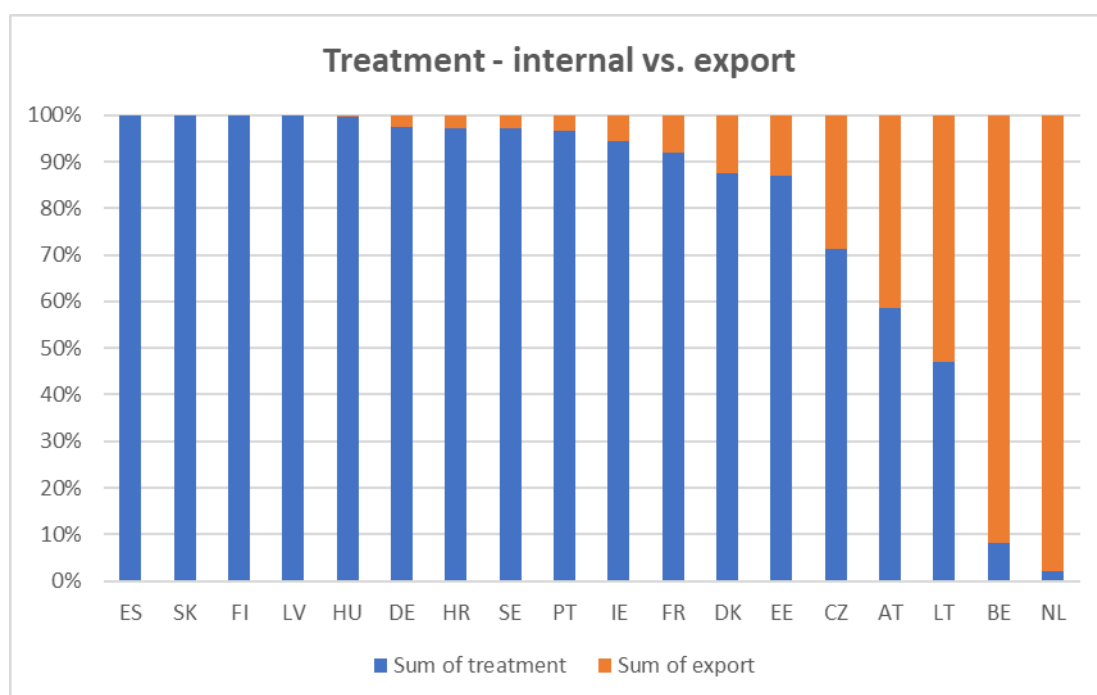


Figure 16: Waste oil internal treatment when vs. export

When looking at the data sets provided on treatment aspects, it is important to note that this set covers regeneration, recycling, energy recovery and disposal. When looking at the objectives of the Waste Framework Directive (WFD), this highlights the need for good waste management based on the waste hierarchy. This implies that waste prevention and re-use are the preferred options, followed by recycling, then energy recovery, while waste disposal through incineration without energy recovery and landfilling should be the very last resort. When treating waste oils, the priority should be given to regeneration or to

⁸⁹ Based on the sum of waste oils recycled by regeneration, recycled by other recycling practices, reprocessing for energy recovery and disposal)

other recycling operations delivering an equivalent or a better overall environmental outcome than regeneration.⁹⁰

Figure 17 below aims to show these relationships by including data on waste oil treatment per process, including the export share. Only a few countries, such as BE, FR, HR and SE provided data on the treatment process of exported waste oil. The clustered column chart in Figure 17 is used to represent values for all possible treatments that are applied within each country. The data is presented in groups of vertical rectangular columns with lengths proportional to the share of the treatment process in a given country. For ease of interpretation of Figure 17, each treatment process is associated with a colour coding (e.g. regeneration: dark green; other recycling: light green; energy recovery: light yellow; and disposal: dark red). The graphical visualisation compiles the data for the internal waste oil treatment process (coloured columns with red borders) and the export (coloured columns with dark blue borders). When the treatment process of the exported waste oils is unknown, the corresponding part of the column is coloured grey. Hence, Figure 17 allows for the assessment of whether the treatment of waste oils in a given country meets the criteria of the WFD by providing an overview of the share of the oil waste per type of treatment process.

⁹⁰ Waste Framework Directive, Art.21(1)(b); available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008L0098-20180705>.

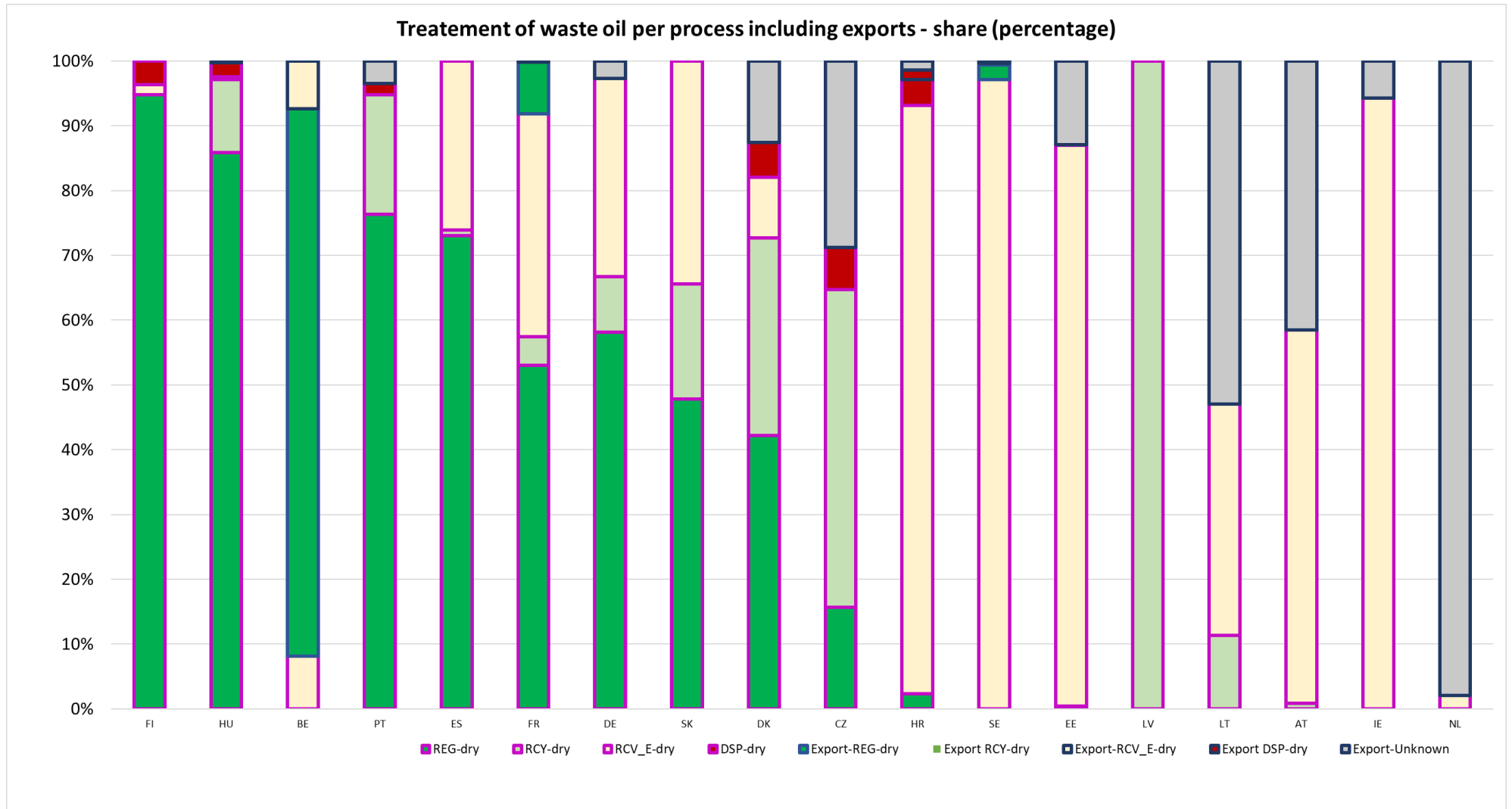


Figure 17: Treatment of waste oil per process including exports - share (percentage)

Source: MS Reporting (2020)

Looking at a full dataset provided in Figure 17, it can be seen that the greatest quantities of waste oil treated are found in countries with a relatively mature system and a regulatory approach that establishes an effective framework for the collection, treatment and presumably monitoring of waste oil.

Unequivocally, the frontrunners of regeneration with the highest share, exceeding 50% of the total waste oil treated are FI, BE, PT, ES, FR and DE. Often these countries are also importers of a considerable amount of waste oil for treatment from other countries (which might not have necessary regeneration facilities), as shown in Figure 18 on import below. These countries have considerable regeneration facilities within their territories, except for BE, for which this performance is reached via intra-EU shipments. According to the data on internal treatment in BE, this country does not have a high internal rate of regeneration or recycling of waste oil. However, when comparing this data with the share of waste oil sent abroad and their final treatment, it is shown that 85% (Figure 10) of waste oil collected and sent abroad is destined for regeneration.

Smaller countries like HR, EE, LT, AT, BE, IE, NL, and SE have a relatively high share of energy recovery, representing more than 75% of the domestic treatment processes. However, when comparing these data with the export share of waste oil, it could be noted that LT, AT, BE and NL count among those treating the lowest quantities of waste oils within their own borders. This can be explained by the fact that small countries might not have sufficient waste oil quantities to set up regeneration facilities (economies of scale), and the collected waste oil is exported, often for regeneration⁹¹, although data is not available for all countries about the final treatment of exported oils. The remaining and rather limited quantities of waste oils in these countries are recovered in other available ways, such as energy recovery, sometimes due to poorer waste oil quality.

Finally, relatively limited number of countries dispose of the collected waste oil.

It should be noted that countries for which data are broadly available, in principle, have a more mature approach to waste oil collection and treatment, where disposal is likely performed as a last resort solution. Hence, it is plausible to assume that the statistics provided do not reflect illegal management and disposal (so-called 'grey zone'), which is rather reflected by suboptimal collection rates.

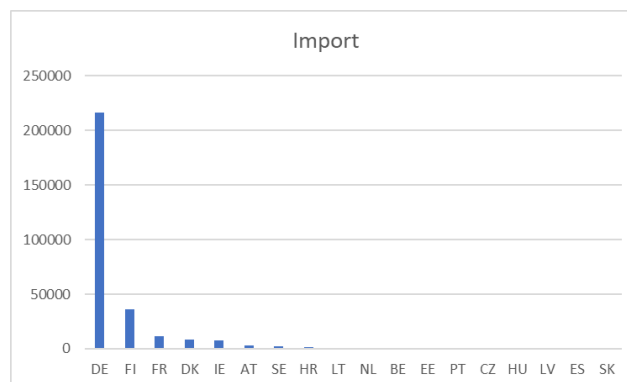


Figure 18: Import of waste oil- quantities (tonnes)

Source: MS Reporting (2020)

⁹¹ When its quality is sufficient to envisage such treatment.

5. TASK 4: WORKSHOP ON WASTE OILS EPR

A stakeholder workshop was held on the 19th of May 2022 with two main objectives:

- Get facts and establish a hierarchy of the problem definition
- Get facts and arguments in favour or against possible policy measures

After a policy background introduction by the European Commission, the aims of the study and the workshop were presented. 4 Member States⁹² presented an overview of their waste oil collection system: Belgium, France, Germany and Poland. Two break-out sessions enabled voting by the participants using Slido and discussing the problem definition and preliminary policy measures. Finally, reporting from the break-out session and a wrap-up were carried out in plenary.

The workshop was attended by 78 participants:

- 19 Member State representative⁹³
- 6 EPRs⁹⁴
- Industry representatives (lubricant and fuel producers, regeneration, cement, hazardous waste management)
- European Commission (DG ENV and JRC)

Participants consider the **price** (price charged to the waste owners for collection) as the **main issue when it comes to increasing the collected quantities** of waste oils. This is especially the case in the following situations that could occur in combination:

- Long transport distance or time,
- Small waste oils quantities to collect,
- Low crude oil prices.

In these situations, illegal practices are more likely to occur (e.g. burning of oil in small boilers for heating).

The main solution that was put forward was to make the collection free of charge for the waste holders, paid via an EPR system. Controls by public authorities were also mentioned as a tool to reduce illegal practices. Nevertheless, the collection rate is high in some countries without an EPR scheme (e.g. Germany). These differences seem to depend on contextual factors which are country-specific:

- Quantity of waste oils per collection point (share of large collection points of waste oil in the country: e.g. industry vs. garages),
- Transport distance or time,
- Environmental awareness of the population.

⁹² With the aim to have a variety of waste oil collection systems: free market, "old" EPR, new EPR and EPR under revision.

⁹³ Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Norway, Poland, Portugal, Spain and Sweden.

⁹⁴ Belgium, France, Greece, Italy, Portugal, and Spain.

Quality of the collected waste oil is considered the main issue when it comes to improving regeneration. Poor quality of waste oils, making them unsuitable for regeneration can arise in different situations:

- Contamination during the service life of the oil, as a result of specific activities by the user: chlorine, etc.
- Mixing of several waste types: waste oils, brake fluids, antifreeze liquid, PCB-contaminated oil, etc.

The solution lies on proper enforcement of the existing mixing ban, and identifying and penalising the waste holders which deliver mixed contaminated waste oils to the collector. The contaminated waste oils should be segregated and treated accordingly. This can be achieved in several ways:

- Controls by public authorities to enforce the mixing ban,
- Raise environmental awareness to avoid mixing,
- EPR or market-based quality control systems.

The detailed report of the workshop is in Appendix 8.5.

6. CONCLUSIONS

Conclusion 1: there is no clear conclusion as to whether an EPR or other collection scheme (e.g. deposit-refund scheme) is necessary to ensure high collection rates.

The necessary conditions for good collection performances are the same with or without an EPR/collection scheme.

Some MS have neither an EPR scheme nor a specific collection scheme in place but perform well (e.g. Germany, Austria). In contrast, other countries have a long-standing EPR scheme in place and show low performances (e.g. Poland, Bulgaria).

The two main factors driving waste oil collection performance are:

- cost/benefit for waste holders. If the waste holder gets paid for the waste oil, collection rates increase. If the waste holder has to pay a high price to have their waste oil taken from him, collection rates tend to be low
- waste holders' willingness to manage their waste legally based on awareness and level of enforcement of mandatory separate collection by Member States

The necessary conditions for good collection performances are the following:

- Good level of service for waste holders, free or with a financial incentive
- Adequate supervision of collection activities / hazardous waste management by public authorities
- High waste holders' awareness

Some countries manage to meet these conditions without a specific scheme in place for waste oils, whereas others that do not have favourable conditions must take additional measures.

Conclusion 2: the characteristics of the financial support scheme appear to have more influence on collection rates than having an EPR scheme in place or not.

Key success factors when designing the financial support scheme are:

- frequent revision based on market conditions (price of diesel fuel use for running collection trucks, base oil price, etc.), annually or more frequently
- differentiation of financial support depending on geographical areas in order to account for differences in logistical costs. This is especially necessary for countries with large differences in collection costs (overseas territories, islands, remote regions, etc.)
- ensuring waste holders receive free collection service
This can be ensured by regulation, combined with financial compensation for waste collectors. This can also be ensured by designing financial support for waste holders under certain conditions of volume and delay.
- monitoring of financial support and fee scales and/or tendering procedures by public authorities

Conclusion 3: if the collection price is not a sufficient incentive, illegal management must be disincentivised.

In all studied Member States, national regulations provide that waste oils must be collected separately, in line with WFD article 21. However, regulation itself does not ensure enforcement. Best practices to encourage legal collection irrespective of the price for collection are:

- communication of clear mandatory segregation practices
- awareness raising activities on existing collection schemes and regarding hazards caused by waste oil illegal treatment
- well-functioning monitoring of waste holders, with regular controls and fines.

This can be supported by a registration system for waste holders. Fines, combined with the probability of control should, in principle, cost more to waste holders than the potential benefits from illegal practices;

- a well-functioning monitoring of waste collectors, with a well-functioning collector registration system, controls, and fines
- well-functioning monitoring of illegal waste oil treatment, including illegal fuel preparation, illegal burning by waste holders and illegal exports

Conclusion 4: the main factor affecting the quality of the collected waste oil appears to be the existence of a price incentive to ensure quality.

There are two options to provide a price incentive to ensure good quality collected waste oils:

- Option 1: Waste oil collection is based on the free market. Waste collectors organise themselves with waste holders as part of contractual agreements to charge them for contaminated waste oils (e.g. with PCBs) to encourage them to better sort their waste oils and to pass on their additional treatment costs.
- Option 2: Regulation guarantees free collection for waste holders. The best policy practice is then to enable waste collectors to charge waste holders for contamination in order to incentivise them to segregate better waste oils, combined with:
 - mandatory quality control procedures. Quality control cost is generally included in the financial support scale as part of EPR schemes.
 - national standards set up either by public authorities or by PROs, under which quality of waste oils waste collectors can charge waste holders. Such standards are not necessary under option 1.

Price incentives can help reduce the most expensive to treat sources of contamination, e.g. PCB. For some contamination sources preventing regeneration but not energy recovery (e.g. brake fluids), the price incentive may not be sufficient to prevent contamination compared with the convenience of mixed collection. Additional policy measures may be necessary:

- precise segregation practices,
- control of waste holders,
- promotion of good separate collection practices and awareness-raising activities.

7. RECOMMENDATIONS

The recommendations focus on the objective to increase collected quantities. Given the fact that the statistical data is currently limited and that according to evidence presented in the recent JRC study, regeneration does often but not always result in an overall better environmental and societal outcome than processing into fuel, increasing waste oil quality is also proposed to be priority.

Recommendation 1: Collection targets that increase with time should be set at EU level.

Given the fact that high collection rates can be achieved with different policy instruments, it is more relevant to set collection rate targets than to impose specific policy measures. Waste oil collection targets can be implemented at a European level and transposed into national legislation. Member States (MS) are requested to achieve an annual waste oil collection rate by a given time frame. How the targets are achieved would be left to the discretion of Member States.

Since waste oil collection rates currently vary widely among MS, two target levels are proposed:

- by 2030, the collection of waste oil should be increased to a minimum of 80 % by weight, based on generated waste oil quantities, in all MS with a current collection rate below 80 %. Those MS should also be required to meet the target of the high-performing MS in 2035: a collection rate of 95 % (see next bullet point). This would lead to a catching up mechanism.
- by 2030, the collection of waste oil should be increased to a minimum of 95 % by weight, based on generated waste oil quantities, in all MS with a current collection rate between 80 and 95 %.

Member States should report on how they calculate the generated waste oil quantities⁹⁵.

Recommendation 2: Member States should implement the policy measures best suited to their national context to increase the collection rate.

The following policy measures are relevant to increase the **collected quantity** at MS-level:

- Subsidy for small waste holders
- Prohibition to financially charge waste holders for collection
- Obligation for collectors to provide collection service (relevant for MS with remote areas)
- Small waste holders to be given access to municipal collection facilities
- Specific criteria to license collectors for waste oil collection

⁹⁵ in line with COMMISSION IMPLEMENTING DECISION (EU) 2019/1004 of 7 June 2019 laying down rules for the calculation, verification and reporting of data on waste in accordance with Directive 2008/98/EC of the European Parliament and of the Council and repealing Commission Implementing Decision C(2012) 2384

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019D1004&rid=5>

Recommendation 3: Waste oil quality should be improved to avoid contamination leading to hazardous waste incineration via policy measures at Member State level.

Avoiding PCB contamination is crucial because it leads to whole batches of waste oils being sent to hazardous waste incineration. The segregation of the contaminated waste oil should be therefore further encouraged and strictly enforced.

It could be achieved via several measures at MS-level:

- Mandatory quality control by waste collectors
- Waste holders that contaminated the waste oil must pay for the treatment
- Establish guidelines that clarify the waste oils that should be kept segregated by the waste holder

8. APPENDICES

8.1. Compiled Member States questionnaires



3701 Waste oils -
compiled MS questi

8.2. In-depth assessment of 10 selected Member States

The following criteria were used to select the 10 Member States for an in-depth analysis.

- Only where sufficient data was available in questionnaire responses, the MS could be selected.
- The sample should contain both MSs with and without an EPR scheme in place.
- Some EPR schemes were very similar to other Member States and overlaps should be avoided.
- Members States with recent or current policy changes would be preferred as more data would be at the Contractor's disposal to perform the assessment.

We have selected 10 out of 17 Member States who have completed the survey on EPR schemes regarding waste oil as candidates for a more in-depth analysis.

- We started the selection process by checking the amount of information provided by the Member States, and thus disregarded Luxembourg, Netherlands, Czechia, and Bulgaria, as their survey answers provided only rather limited information.
- Seven out of the remaining 14 Member States with enough data have active EPR schemes, and to allow an insight into both the Member States with and without an EPR scheme, we aimed at choosing 6 Member states with an EPR scheme and 4 without.
- The main criteria for the four chosen Member States without an EPR scheme were the geographical spread and recent policy developments. Therefore, Hungary, Germany, Estonia and Finland were chosen. Austria, Norway and Sweden were excluded due to the similarities of their EPR schemes (with Germany and Finland) and to ensure geographical balance.
- From the seven Member States with enough data and an EPR scheme in place Belgium, Spain, Portugal, Croatia, France, and Poland were chosen.

This section summarises the results.

Table 28. Criteria for selection

Country	Sufficient Data	EPR Scheme	Overlap with other countries	Ongoing changes to the system	Selection for the in-depth assessment
Austria	X		X (Estonia)		
Belgium	X	X			X
Bulgaria		X			
Croatia	X	X			X
Czechia					
Estonia	X		X (Austria)		X
Finland	X				X
France	X	X	X	X	X
Germany	X		X (Austria)		X
Hungary	X			X	X
Lithuania	X	X			
Luxembourg					
Netherlands					
Norway	X		X (Sweden)		
Poland	X	X		X	X
Portugal	X	X			X
Spain	X	X			X
Sweden	X		X (Norway)		

8.2.1. Belgium

Country	Belgium														
General data ⁹⁶															
Population	11,455,519														
Population density (per km ²)	377,3														
GDP per capita (€/capita) ⁹⁷	36,080														
EPR system (yes/no)															
Start date of the EPR	Legally between 2002 and 2004 depending on regions (2002 in Wallonia, 2003 in Brussels, 2004 in Flanders) 2007: start of the PRO operations														
Voluntary/mandatory	Mandatory														
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	<table border="1"> <tbody> <tr> <td>Y</td> <td>Engine and gear box oil</td> </tr> <tr> <td>Y</td> <td>Industrial oil⁹⁸</td> </tr> <tr> <td>Y</td> <td>Metal working oils and other oils leading to emulsions</td> </tr> <tr> <td>N</td> <td>2-stroke engine oil (lost oils)</td> </tr> <tr> <td>N</td> <td>Lubricants sold inside vehicles</td> </tr> <tr> <td>N</td> <td>Marine engine lubricating oil</td> </tr> <tr> <td>N</td> <td>Greases</td> </tr> </tbody> </table>	Y	Engine and gear box oil	Y	Industrial oil ⁹⁸	Y	Metal working oils and other oils leading to emulsions	N	2-stroke engine oil (lost oils)	N	Lubricants sold inside vehicles	N	Marine engine lubricating oil	N	Greases
Y	Engine and gear box oil														
Y	Industrial oil ⁹⁸														
Y	Metal working oils and other oils leading to emulsions														
N	2-stroke engine oil (lost oils)														
N	Lubricants sold inside vehicles														
N	Marine engine lubricating oil														
N	Greases														
Scope – exempted producers	<p>VALORLUB is the only PRO currently approved for the management of the EPR scheme for waste oils. All lubricant suppliers must join it, except those who constitute an individual system.</p> <p>Nearly 200 companies are participating in the VALORLUB system. The number of oils producers that do not contribute to the EPR system is probably low (free riders represents on average less than 2% of the market).</p>														
PRO(s) name(s)	VALORLUB ⁹⁹														
Existence of a central register of producer	All producers/members of the PRO are in a register.														
Entity/ies in charge of feeding it	VALORLUB														

⁹⁶ Eurostat 2019⁹⁷ Real GDP⁹⁸ The Belgian EPR applies to all lubricating and industrial oils, whether mineral, synthetic, vegetable or animal, in particular engine oils, gearbox oils as well as machine, turbine, heat transfer and hydraulic oils. The following are excluded from the EPR scope: frying oils and fats or other oils for food use (these are subject to a dedicated EPR scheme);

PCBs, PCTs, solvents, cleaning agents, detergents, antifreeze, brake fluids, fuels and other materials; hydraulic fluids whose base is water and/or glycols.

⁹⁹ <https://valorlub.be/en/return-waste-oil>

Final Report

Entity/ies in charge of controlling the register	V	PRO
		Environmental agency
		Environmental ministry
		Tax agency
Legislation		
EPR / collection schemes	<p>The management of waste oils is governed by 3 decrees (one for each regions): Wallonia: Link Brussels-Capital Region: Link 1 and Link 2 Flanders: Link</p> <p>The organisation and obligations of the PROs of the EPR scheme for lubricants are detailed in the environmental conventions of the three regions: Wallonia (2020 for two years): Link Brussels-Capital Region (2019 for six years): Link Flanders (2020 for eight years): Link</p> <p>The PROs objective is to ensure the collection and recycling objectives while leaving collection and treatment to the free market.</p> <p>Collection and regeneration requirements in the different regions:</p> <p>Wallonia: > 90% for the collection rate (out of waste oils generated) and > 60% of the waste oils collected sent to regeneration (regeneration or reuse) Brussels-Capital Region: a collection rate higher than 90% and > 85% of waste oils sent to regeneration (regeneration, recycling or reuse) Flanders: a collection rate higher than 90% and > 90% of waste oils sent to regeneration (regeneration or treatment with an efficiency greater than or equal to regeneration)</p> <p>VALORLUB is not an organisational system: VALORLUB does not organise the collection but contracts with collectors.</p>	
Quality standards	To be financially supported, waste oils should contain less than 10% water and not be mixed with PCBs, water, solvents, cleaning products, vegetable	

Final Report

	<p>or animal oils, detergents, brake fluids, fuels or other hazardous waste.</p>
Collection	<p>There are two ways to meet the legal requirements on collection:</p> <p style="padding-left: 40px;">Individually: each lubricant supplier takes back waste oils from its customers free of charge in accordance with an individual management plan approved by the regional authorities. Only one individual system has been put in place in practice (Exxon).</p> <p style="padding-left: 40px;">Through a collective system with the PRO (VALORLUB) to which producers adhere.</p> <p>Only in Wallonia, licensed collectors are obliged to collect as soon as possible (no specific delay mentioned) quantities above 200 litres.</p>
Mixing: bans and conditions ¹⁰⁰	<p>In the legislation, the producers are not allowed to mix waste oils (especially with brake fluids).</p> <p>According to the environmental agreement of the federations, if waste oils are contaminated, the holder responsible for the contamination is required to pay for the decontamination.</p>
Treatment	<p>As the regeneration facilities are located outside the territory, they are not subject to Belgian regulations.</p> <p>In Wallonia, treatment facilities for energy recovery are subject to obligations defined in the Walloon Regional Executive Order on waste oils of 9 April 1992.¹⁰¹</p>
Export	<p>In the legislation in Flanders, there is no ban on the export of waste oils for energy recovery. If a notification would be asked for the export of waste oil for energy recovery the public authorities would refuse it if the oil can be regenerated.¹⁰² In practice the public authorities do receive no notifications for export of waste oils for energy recovery. In the Brussels-Capital Region, there is a ban on export to non OECD countries for all dangerous waste flows.</p>

¹⁰⁰ Flemish regulation on the sustainable management of material cycles and waste of 17 February 2012

¹⁰¹ <http://environnement.wallonie.be/legis/dechets/decat005.htm>

¹⁰² The refusal would be based on the targets for the treatment of waste oil in Vlarema (min 90% regeneration/other recycling, max 10% energy recovery).

Final Report

End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	No	
Waste oils mass flow (2019) ¹⁰³		
Quantities placed on the market (t) ¹⁰⁴ (2020)	64,576,330 (4,888,055 of household oils and 59,688,275 of professional oils)	
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	64,2% ¹⁰⁵	
Collected quantities (t)	42,146,683 (2,449,472 of household oils and 39,697,221 of professional oils)	
Regeneration%	87.3 % (Waste oils are sent to the North of France, the North Rhine-Westphalia (Germany), or Finland ¹⁰⁶ .)	
Processed into fuel %	0%	
Cement/lime kilns %	6.7%	
Power plants %	0%	
HWI ¹⁰⁷ %	6%	
Other %	0%	
Collection		
Type of collected waste oils inside the collection / EPR scheme	Y	Engine and gear box oil
	Y	Industrial oil
	Y	Emulsions
	N	Marine lubricating oil (separately)
	N	Marine slop oils (mixed with fuels)
Type of waste holders in the collection /EPR scheme	y	Recycling centres / municipalities
	y	Garages
	y	Harbours
	y	Inland harbours
	y	Small companies (e.g. farms, SMEs...)
	y	Industries
Existence of intermediate storage / pre-treatment facilities	No: Pre-treatment (removal of water and sediment) and treatment of waste oils are carried out in the treatment facilities.	

¹⁰³ Annual report VALORLUB 2021 (<https://valorlub.be/fr/valorlub>)

¹⁰⁴ subject to the EPR scheme

¹⁰⁵ 1 litre equals 0.85 kilos.

¹⁰⁶ Example: Waste oils are sent to Rotterdam or Amsterdam by road and then by ship to Finland.

¹⁰⁷ Hazardous waste incineration: Disposal concerns the water and sediment fractions of waste oils. 5% of this fraction is eliminated in water treatment plants and 1% is incinerated.

<p>Collection conditions depending on stakeholders</p>	<p>Waste holders are divided into two categories in order to reflect different management costs and practices:</p> <p>those who take back waste oils from households, i.e. the civic amenity sites: lubricants sold in 25 kg containers maximum (8% of waste oils subject to the EPR)</p> <p>And those who take back waste oils from professionals: all other oils that generate waste oils, including lubricant sold with product and oils used by garages in packaging > 25kg for private vehicles (92% of waste oils subject to the EPR)</p> <p>The financial support given to waste holders by the PRO varies according to the category to which they belong, as does the financial responsibility for non-compliant waste oils (EPR must pay for contamination in civic amenity sites).</p>
<p>Free collection for waste holders</p>	<p>Free collection is not guaranteed.</p> <p>Individuals can bring their waste oil to the municipal recycling centre for free.</p> <p>Companies must have their waste oil collected by an accredited collector.</p> <p>The market conditions in Belgium mean that collection is generally free of charge or remunerated by the collectors for large waste holders, and paid for by the smaller ones.</p>
<p>Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)</p>	<p>There is no minimum quantity for the collection. So, it will be between the waste holders and the collector to find the best agreement (free market).</p> <p>Collectors must be licenced by the regional authorities according to the environmental conventions in force. For example, AVISTA OIL owns 3 permits (one for each region) and 3 transport licences.</p> <p>Collection is subject to the free market (price determined by supply and demand) without financial support for waste holders with more than 10,000 l/year. Waste holders with less than 10,000 l/year can receive a flat financial allowance from VALORLUB to help them finance the collection invoiced to them by the collectors only if the collector is approved by the PRO.</p>
<p>Involvement of treatment operators in collection activities / schemes</p>	<p>Yes. For example, the collector AVISTA OIL owns a regeneration facility in Germany.</p>

Geographical coverage	Most collectors collect in the three Belgian regions.
Quality	
Separate collection of waste oils of different quality / composition	<p>Composition: VALORLUB has standards in place for the quality of waste oils collected from municipalities to be complied with in order to receive financial support.¹⁰⁸</p> <p>Separate collection: Brake fluids and coolants are collected separately in different compartments or in a different truck collecting drums directly. If there is a doubt on the quality¹⁰⁹, waste oils are separated in different compartments.</p>
Key actions of the EPR / collection scheme to improve waste oil quality for regeneration	<p>Quality control: At each collection point, two samples are taken: one for the waste holder and the other one for the collector. After collection, waste oils are analysed at the storage site in Belgium. If the waste oil meets the criteria for regeneration, then a second analysis is carried out at the regeneration plant.</p> <ul style="list-style-type: none"> • Awareness and education campaign AVISTA OIL sends the collection conditions to each client with the quality requirements for the waste oils (to improve the quality of the waste oils by informing the waste holders of the best practices for waste oils management for example not mixing oils). The main objective of VALORLUB's communication is to improve the collection quantity (e.g. informing waste holders about available means of collection etc). VALORLUB carries out communication campaigns via

¹⁰⁸ <https://valorlub.be/en/waste-oil-premium/conditions-for-premium>

¹⁰⁹ Examples: destruction factories, metal industries...

Final Report

	<p>various media¹¹⁰ with users and waste oil holders to remind them of good practices for managing waste oils and separating them from other waste streams.</p> <p>TRAXIO relays VALORLUB communication campaigns to its members and also communicates to its members information on the compensation system and best practices in a magazine.</p>
End-treatment depending on quality	PCB- contaminated waste oils are eliminated in the INDAVER thermal treatment plant in Antwerp (Belgium).
Financing	
Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees	<p>For 2022, the General Assembly of Valorlub has set the following rates for the contribution</p> <ul style="list-style-type: none"> 0.25 euro per litre for domestic oil (= motor oil in containers less than or equal to 25 kilograms) 0.03 euro per litre for professional oil (= everything other than household oil that generates waste oils) 0 euro per litre for oil that does not produce used oil <p>Every year, in December, VALORLUB carries out a survey on the prices charged for collection:</p> <ul style="list-style-type: none"> With collectors And with garages by a survey from the TRAXIO federation <p>=> These two sources (which often do not coincide in practice) make it possible to estimate which waste holders pay for collection and at what price. The financial support conditions to waste holders are set on this basis annually in December for the following year.</p>
Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions	<p>The EPR scheme compensates for the collection and treatment of waste oil collected in municipal recycling centres¹¹¹.</p> <p>Small waste holders (< 10 000 l/year) also receive a flat financial support from VALORLUB, because they generally cannot have their waste oil collected for free.</p>

¹¹⁰ Radio, magazines, posters, website.

¹¹¹ The local authorities are compensated by VALORLUB for the cost of collection as well as for part of the costs of managing the civic amenity sites (infrastructure cost).

Final Report

	<p>The fixed fee for collection in 2022 is:</p> <ul style="list-style-type: none"> - from 0 to 5,499 litres per year: 115 € per year - from 5,500 to 7,499 litres per year: 150 € per year - from 7,500 to 9,999 litres per year: 200 € per year <p>Even if the collection or treatment operators are not fully financed by the system, the quality control and reporting of the collectors is compensated by the EPR.</p>	
Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions	If the regeneration would not be competitive compared to energy valorisation in the cement industries, the EPR has foreseen a compensation mechanism to foster regeneration.	
Instruments to finance collection in isolated / remote areas	Yes	Differentiated fee scale
	No	Financing transport cost
Instruments to adapt financing to oil prices	<p>In 2020, a consulting firm¹¹² conducted a study to assess the total cost of the collection system in order to better set the targets and the amount of compensation. The study also set the threshold of 10 000 litres, below which waste holders receive a compensation.</p> <p>⇒ The financial allowance generally paid to waste holders can be revised if the collection costs increase.</p> <p>However, the compensation threshold is an average whereas there are heterogeneities of population density in Belgium (for example population density is higher in Flanders than in Wallonia).</p> <p>The prices of treatment facilities have changed a lot recently. Today, VALORLUB is covering more than the cost of the waste holder (because oil prices are high), while it probably did not fully cover the costs in the past.</p>	
Reporting: procedure for reporting, verifications / audits		
Collectable quantities	70% of the collection points are garages, 25% industries and 5% farmers sites.	
Collected quantities	Every month, AVISTA OIL sends an Excel file to VALORLUB, containing the quantity of waste oils collected per site (example garages, industry etc)	

¹¹² The study is confidential.

Final Report

	and the quantity sent to recycling/incineration. They always mention the origin of the waste oil.
Non-collected collectible waste oils	NA
Waste oils quality assessment	<p>VALORLUB is not in charge of controlling the quality of waste oils.</p> <p>According to OVAM, there is a low percentage of contamination and VALORLUB doesn't report many violations. On average over the last ten years in Belgium, two cases of contamination per year are reported (which represents a quantity of less than 10 tonnes per year).</p> <p>According to TRAXIO, these PCB contaminations mainly come from civic amenity sites, and therefore from households.</p> <p>When oil prices are high, waste holders are paid for their waste oils. There might be more contamination issues when prices are high because waste oil holders add other waste streams in the waste oil to increase the volume.</p>
Quantities per type of treatment and destination	VALORLUB has the new obligation to report of the output of waste oil treatment. However, this reporting is complicated because VALORLUB doesn't have contracts with the processors, which makes it more difficult to obtain data.
Treatment	
Geographical destination specify regional / national / Eu-wide	EU-wide and national
Regeneration	<p>There is no regeneration plant in Belgium.</p> <p>Belgian waste oils go to 10 regeneration facilities: 6 in Germany, 3 in France and 1 in Finland.</p> <p>The regeneration is more profitable than the energy valorisation in cement plants. Transport costs are not an issue for regeneration.</p>
Processed into fuel	Treatment not used
Cement/lime kilns	France and Belgium
Power plants	Treatment not used
HWI	Belgium (Antwerp)
Other	Treatment not used
Illegal collection and treatment	
Fate of non-collected collectible oil	NA
Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	NA
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	Controls are made by public authorities in each Belgium region, especially in garages. Companies are also controlled but there are fewer illegal practices in the industry.

Final Report

<p>Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)</p>	<p>Garages can use waste oils for heating . Burning waste oil in garages is prohibited by law unless the garage has adequate facilities. However, these adequate installations are very expensive.</p> <p>Small garages are disappearing with the economic situation. The remaining large garages do not burn waste oils because they have a lot of waste oils.</p>
<p>Legal status</p>	<p>Controls are made by public authorities in each Belgian Region, especially in garages. Companies are also controlled but there are fewer illegal practices in the industry.</p> <p>For the Brussels-Capital region, if there is a complaint about illegal practices in a garage, the authority has the obligation to investigate.</p> <p>If the authority has found an infringement, the controller writes a fine for illegal burning waste. The amount of the fee depends on several factors. The fine increases if there is a repeat of infringement.</p> <p style="padding-left: 40px;">In the Brussels-Capital region, for example, there is an excel file gathering all of the controls and if a company has several infractions, the penalty increases.</p> <p style="padding-left: 40px;">The main problem with the penalty is that there is no difference between a large and a small company in the Brussels-Capital Region.</p> <p style="padding-left: 40px;">It is difficult to prove that a waste holder burns waste oils: the authorities have to see the action of burning oil and sometimes waste holders can burn oils in another place. The most important suspicion taken into account for illegal practices is the lack of documentation proving that the waste holder has a contract with a collector.</p>
<p>Quantities / proportion treated that way</p>	<p>5 % of garages burn their waste locally but this represents a smaller proportion in volume as these are mainly small garages</p>
<p>Number of incidents reported</p>	<p>Each year, between 50 and 70 garages are controlled by the Flemish authorities. Out of these controlled garages, 3 or 4 garages (i.e. around 5%) have illegal practices. These controls were carried out randomly. Certain controls at garages are targeted, for example for the treatment of end-of-</p>

Final Report

	<p>life vehicles. In these controls the aspect waste oil is also included.</p> <p>In 2017, OVAM controlled waste oil holders in the Flemish Region and found 3 garages out of 73 companies inspected were illegally burning their waste oils.</p> <p>However, there is no feedback for Wallonia and the Brussels-Capital Region.</p>
Actors	
Competent public authorities	<p>The waste oils EPR in Belgium is managed by public bodies at regional level:</p> <p>The OVAM (Public Waste Agency of Flanders) in Flanders; The OWD (Walloon Waste Office) in Wallonia; IBGE (Brussels Institute for Environmental Management) in the Brussels-Capital Region.</p>
Producer Responsibility Organisation	VALORLUB ¹¹³
Key re-refiners	AVISTA OIL, OSILUB, ECO HUILE, BAUFELD MINERALÖLRAFFINERY etc.
Key collectors	Eleven waste ¹¹⁴ oil collectors were approved by VALORLUB and approved by the regional authorities in 2019.
Key producers	<p>Nearly 200 companies.</p> <p>There are three categories of producers:</p> <p>ENERGIA (former FPB (Belgian Petroleum Federation)) has the biggest part of the market Lubricants producers: Unil, Fuchs etc. Importer of oils or machines containing oils (e.g. all importers of vehicles)</p>
Bibliography	
Literature/documents/annual reports	<p>https://valorlub.be/en/ ADEME - European review of extended producer responsibility (EPR) schemes for lubricants (2021)¹¹⁵ VALORLUB Annual report (2020)</p>
Contacted stakeholders	VALORLUB (PRO)

¹¹³ <https://valorlub.be/en/return-waste-oil>

¹¹⁴ 15 collection operators, with RENEWI and SUEZ having several separately approved sites

¹¹⁵ <https://bibliographie.ademe.fr/dechets-economie-circulaire/4507-bilan-europeen-des-filieres-a-responsabilite-elargie-des-producteurs-rep-pour-les-lubrifiants.html>

	AVISTA OIL (waste management company with a re-refinery) ¹¹⁶ : OVAM (Public Waste Agency of Flander) Brussels environment TRAXIO (Federation of Mobility Retail and Technical distribution) ¹¹⁷
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Conclusions

In Belgium, waste management is a regional competence, and the PRO can choose the system as long as it meets the EPR requirements imposed by the authorities. VALORLUB chose to focus on compensation for small quantities (under 10,000 litres per year) because there were more illegal practices when waste holders had only a small quantity of oils to collect and because waste holders with large quantity are getting paid. The relationship between collectors, treatment plant operators and waste holders is determined by the free market. Waste holders can choose their collectors freely: the PRO does not intervene in the selection of collectors.

There are no regeneration facilities in Belgium because the quantity is not sufficient to achieve economies of scale. All stakeholders interviewed on the functioning of EPR are satisfied with the EPR system, which achieves high collection and regeneration performance.

The explosion of the market for hybrid and electric vehicles is driving down the value of oils as these vehicles do not contain this type of oil. Therefore, the fee system will probably need to be reassessed in the future.

Finally, as VALORLUB is not an operational organisation, the PRO does not have specific information (for example on the modalities of collection, the type of waste holders etc). The public authorities want to increase the reporting but this lack of collection of data from the value chain could become a problem in the future.

¹¹⁶ AVISTA OIL collects and stocks waste oils from Belgium and sends it to their re-refinery in Germany. AVISTA OIL collects a third of the waste oils in Belgium.

¹¹⁷ Founding member and part of the general assembly of VALORLUB

8.2.2. Croatia

Country	Croatia														
General data															
Population	4 054 621														
Population density (per km ²)	73														
GDP per capita (€/capita)	13 460														
EPR system (yes/no)															
Start date of the EPR	2006														
Voluntary/mandatory	Mandatory														
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	<table border="1"> <tr> <td>Y</td> <td>Engine and gear box oil</td> </tr> <tr> <td>Y</td> <td>Industrial oil</td> </tr> <tr> <td>Y</td> <td>Metal working oils and other oils leading to emulsions</td> </tr> <tr> <td>Y</td> <td>2-stroke engine oil (lost oils)</td> </tr> <tr> <td>P</td> <td>Lubricants sold inside vehicles</td> </tr> <tr> <td>Y</td> <td>Marine engine lubricating oil</td> </tr> <tr> <td>Y</td> <td>Greases</td> </tr> </table> <p>Notably, edible/cooking oils are also part of the EPR scheme.</p> <p>* unless vehicles are imported</p>	Y	Engine and gear box oil	Y	Industrial oil	Y	Metal working oils and other oils leading to emulsions	Y	2-stroke engine oil (lost oils)	P	Lubricants sold inside vehicles	Y	Marine engine lubricating oil	Y	Greases
Y	Engine and gear box oil														
Y	Industrial oil														
Y	Metal working oils and other oils leading to emulsions														
Y	2-stroke engine oil (lost oils)														
P	Lubricants sold inside vehicles														
Y	Marine engine lubricating oil														
Y	Greases														
Scope – exempted producers	<p>Waste oils that were not produced or bought in Croatia are not part of the EPR scheme, and are not concerned by the fees imposed by the PRO (eg. Waste oils sold inside boat or vehicles coming from abroad).</p> <p>All edible or lubricant oil producers or buyers in Croatia are part of the EPR system.</p>														
PRO(s) name(s)	<p>Environmental Protection and Energy Efficiency Fund (FZOEU)</p> <p>The FZOEU is dependent on public authorities, and the central point for managing programmes and projects of environmental and a nature protection, energy efficiency, and renewable energy use.</p>														
Existence of a central register of producer	Yes														
entity/ies in charge of feeding it	FZOEU														
entity/ies in charge of controlling the register	<table border="1"> <tr> <td>X</td> <td>PRO</td> </tr> <tr> <td></td> <td>Environmental agency</td> </tr> <tr> <td>X</td> <td>Environmental ministry</td> </tr> <tr> <td></td> <td>Tax agency</td> </tr> </table>	X	PRO		Environmental agency	X	Environmental ministry		Tax agency						
X	PRO														
	Environmental agency														
X	Environmental ministry														
	Tax agency														
Legislation															

<p>EPR / collection schemes</p>	<p>Ordinance on waste oil management – NN 124/06</p> <p>Decision on the amendment of the Decision on the amendment of the fee in the waste oil management system – NN 57/20</p> <p>Specificities of fees, types and amounts of fees, payment details and deadlines, required authorizations, reporting obligations, standards of quality and good practices concerning the handling of waste oils are listed in this Ordinance. Notably:</p> <ul style="list-style-type: none"> • The objectives for the management of waste oils are: <ul style="list-style-type: none"> • 1. to ensure the separate collection of waste oils and • 2. to ensure the treatment of waste oils. <p>Free of charge collection for waste holders is mandatory.</p> <p>Collection costs covered by the EPR should include collection, conditioning, storage and transportation.</p> <p>Fees and financings are fixed and litre-dependant.</p> <p>Collection by waste holders and collectors in containers that are not prescribed to receive waste oils is forbidden.</p> <p>Recovery and/or disposal of waste oils (including burning) that cause air pollution above the level prescribed by current regulations is forbidden.</p>
<p>Quality standards</p>	<p>Ordinance on waste oil management – NN 124/06</p> <p>Containers must be leak-proof and closed, and must systematically be marked with details on oil category (see: Mixing: bans and conditions), dates and origin of waste oils.</p> <p>Oils with PCBs and PCTs can be regenerated as long as resulting oils (after treatment) do not exceed 5 mg/kg of both PCBs and PCTs.</p>
<p>Collection</p>	<p>Ordinance on waste oil management – NN 124/06</p> <ul style="list-style-type: none"> • Oil producers have to inform sellers and distributors notably about potential places of collection for the end-of-life. • Oil sellers must inform buyers of places where waste oils can be handed over and collected free of charge, or of actors that can collect them.

	<ul style="list-style-type: none"> •Local authorities must establish a certain number of recycling yards (civic amenity sites) in their area, which are obliged to take over waste oils from citizens free of charge. •Waste holders must give completed supporting sheets with information notably related to the quantities and origin of waste oils to collectors during collection. <p>The right to perform waste oil management activities (including disposal or regeneration) is acquired on the basis of a permit obtained in accordance with the Croatian Waste Act (178/04 and 111/06)</p>
<p>Mixing: bans and conditions</p>	<p>Ordinance on waste oil management – NN 124/06 (+ Waste Management Act (OG 84/2021))</p> <p>The mixing of waste oils that have different properties and the mixing of waste oils and other waste or substances shall be prohibited if such mixing would prevent regeneration or other recycling operations that result in an equally valuable or the more environmentally sound outcome compared to regeneration.</p> <p>According to the pollution level, waste lubricating oils are classified into four categories:</p> <p>Category I – waste oils of mineral origin with halogen content below 0.2% and total of polychlorinated bi- and terphenyls below 20 mg/kg. These oils may be treated and reused for production of fresh oils.</p> <p>Category II – waste oils of mineral, synthetic and plant origin with halogen content above 0.2% and below 0.5% and total of polychlorinated bi- and terphenyls above 20 mg/kg and below 30 mg/kg. These oils may be used as fuel in energy and production facilities with the installed power of appliances larger than or equal to 3MW or in kilns for clinker production in cement plants.</p> <p>Category III – waste oils of unknown origin and all other waste oils with halogen content above 0.5% and total of polychlorinated bi- and terphenyls above 30 mg/kg and ignition point below 550 C. These oils must be incinerated in furnaces for incineration of hazardous waste of minimal effectiveness of 99.99%.</p> <p>Category IV – polyglycolides/olyglycolides, waste oils based on polyglycolide/olyglycolide which, due to non-mixing with other oils of I and II category and special requirements in the elimination process must be collected and recovered and/or disposed separately.</p> <p>Oils from categories I and II may be mixed, but no other mixing of oils is allowed, implying mixing of waste oils with waste containing significant concentrations of PCB/PCT is forbidden.</p>

Final Report

	Edible oils must be collected separately from lubricant oils as well.
Treatment	Ordinance on waste oil management – NN 124/06 Regeneration is to prioritize over other forms of recovery or disposal. In case regeneration is not possible in Croatia, the collector must consider exporting the waste oils for recovery abroad (with priori consent from the PRO).
Export	Ordinance on waste oil management – NN 124/06 Exportation for treatment abroad is to be paid HRK 4.5/kg (0.6€/kg) by the collector. No mention of any limitation or threshold on the exported quantities of waste oils by collection actors.
End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	Unknown
Waste oils mass flow	
Quantities placed on the market (t)	36,033 tonnes of lubricating oils (~50% produced, ~50% imported) in 2020 ¹¹⁸
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	~18,000 tonnes in 2020 (Estimated at 50% oils put on the market in collection rate calculations)
Collected quantities (t)	<i>For reference:</i> 5,835 tonnes in 2012 ⁹ 7,858 tonnes in 2016 ¹¹⁹ (~90% lubricant oils and ~10% edible oils) 10,783 tonnes of waste lubricating oils in 2020 (including 4,073 tonnes outside of the PRO's system) from which 95.4% were treated for energy recovery in Croatia, 0.9% was exported for recovery (recovery pathways are unspecified), and 4.6% remained temporarily stored in collection/treatment facilities. (Capture rate = ~30%, estimated collection rate = ~60%)
Regeneration %	0%
Processed into fuel %	~2% (production of fuel)
Cement/lime kilns %	~89%

¹¹⁸ MINGOR (2021) Pregled podataka o gospodarenju otpadnim uljima za 2020 (Review of data on waste oil management for 2020)

¹¹⁹ HAOP (2016) Izvjesce o posebnim kategorijama otpada za 2016 (Report on special categories of waste for 2016)

Final Report

Power plants %	N/A												
HWI %	~4%												
Other %	N/A												
Collection													
Type of collected waste oils inside the collection / EPR scheme	<table border="1"> <tr> <td>X</td> <td>Engine and gear box oil</td> </tr> <tr> <td>X</td> <td>Industrial oil</td> </tr> <tr> <td>X</td> <td>Emulsions</td> </tr> <tr> <td>X</td> <td>Marine lubricating oil (separately)</td> </tr> <tr> <td>X</td> <td>Marine slop oils (mixed with fuels)</td> </tr> </table>	X	Engine and gear box oil	X	Industrial oil	X	Emulsions	X	Marine lubricating oil (separately)	X	Marine slop oils (mixed with fuels)		
X	Engine and gear box oil												
X	Industrial oil												
X	Emulsions												
X	Marine lubricating oil (separately)												
X	Marine slop oils (mixed with fuels)												
Type of waste holders in the collection /EPR scheme	<table border="1"> <tr> <td>X</td> <td>Recycling centres / municipalities</td> </tr> <tr> <td>X</td> <td>Garages</td> </tr> <tr> <td>X</td> <td>Harbours</td> </tr> <tr> <td>X</td> <td>Inland harbours</td> </tr> <tr> <td>X</td> <td>Small companies (e.g. farms, SMEs...)</td> </tr> <tr> <td>X</td> <td>Industries</td> </tr> </table>	X	Recycling centres / municipalities	X	Garages	X	Harbours	X	Inland harbours	X	Small companies (e.g. farms, SMEs...)	X	Industries
X	Recycling centres / municipalities												
X	Garages												
X	Harbours												
X	Inland harbours												
X	Small companies (e.g. farms, SMEs...)												
X	Industries												
Existence of intermediate storage / pre-treatment facilities	<ul style="list-style-type: none"> Local authorities must ensure that a public collection service of municipal waste, in which separate collection of wastes takes place. Internalized physical (sedimentation of substances and phase separation of water) and chemical (PCB and other chemical testing) treatments of waste oils are conducted by CIAK and CIAN, the biggest collectors in Croatia. Those collectors also own laboratories, and occasionally check for specific chemical contents (such as chlorine) if there is a suspicion of a potential contamination, for instance based on sectorial processes. 												
Collection conditions depending on stakeholders	N/A												
Free collection for waste holders	Yes												
Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)	<p>Both producers, waste oil collectors and treatment operators must be registered and authorized by the PRO to take part in the EPR scheme. It is not known however whether this registration is done by collectors on a voluntary basis or whether it is mandatory.</p> <p>According to collection actors, there is no volume threshold for free collection. Furthermore, there is no restriction to cover specific geographical areas, nor there is obligation to cover the entire national territory.</p> <p>Financing of collection is based on perceived quantities by treatment operators. Thus, there is an incentive both for consistent recovery of waste oils, and for ensuring quality</p>												

Final Report

	standards are met (as purchases by recovery actors are market-based and quality-dependent).
Involvement of treatment operators in collection activities / schemes	In addition to performing controls for calorific value as well as water and PCB contents of acquired waste oils, treatment operators provide the PRO with reports assessing received quantities from collectors, allowing for subsequent financing by the PRO.
Geographical coverage	<p>The EPR system helped make nation-wide collection possible. There is however no geographical boundaries for collectors, as free market is in action and they are allowed to collect anywhere in Croatia.</p> <p>Nationwide. In 2020, 24% of waste lubricating oils were collected in Zagreb and its peripheral areas. While the northern part of the country is more industrialized, the eastern part of the country is much poorer, and collection points are more sparse and mostly concern small businesses such as workshops and garages.</p>
Quality	
Separate collection of waste oils of different quality / composition	Edible and lubricating waste oils must be separated. Waste oils must be separated from substances with significant PCB or PCT contents.
Key actions of the EPR / collection scheme to improve waste oil quality for regeneration	<p>Quality of collected waste oil can affect the prices paid to collectors by treatment operators, but does not influence financings from the FZOEU.</p> <p>The main actions that favour recovery of waste oils are therefore regulatory, such as:</p> <ul style="list-style-type: none"> - an obligation for strict segregation of edible and lubricating oils, - directives for sample analyses related to PCB and water content - an obligation for actors to use reports and technical sheets ensuring the traceability of waste oils - segregation of waste oils from substances with high PCB contents <p>The main incentive for ensuring the quality of waste-oils by collectors is market-based, however.</p>
End-treatment depending on quality	Most collected waste oils of known quality are sold to cement plants. Lower quality ones and greases are usually sent to incineration.
Financing	
Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees	Producer fees have evolved from 1 HKR/liter (0.13€/liter) in 2006 to 0.54 HKR/liter (0.072€/liter) nowadays. Changes applied to the EPR fee are made through amendments to the initial ordinance, but no procedure allows for systematic adaptation of EPR fees (to market prices, for instance).




Final Report


	Producers exporting oils may deduct exported quantities from the fee.
Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions	<p>Collectors are financed by the EPR system.</p> <p>Financings authorized to collectors for waste oils (including cooking oils, though collected separately) is fixed at 1 HKR/liter (0.13€/liter). No procedure allows for systematic adaptation of EPR financings based on collected quantities.</p> <p>Additional costs for ferry transportation in cases of insular collection may also be financed, however.</p>
Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions	N/A
Instruments to finance collection in isolated / remote areas	Differentiated fee scale
	X Financing transport cost: Ferry transportation to insular regions is covered by the PRO. However, the fact that a truck and one or two operator(s) are mobilized for an entire day for such collection events makes them sometimes not profitable enough for CIAN (depending on the potential demands by other waste holders at that given moment).
Instruments to adapt financing to oil prices	None
Reporting: procedure for reporting, verifications / audits	
Collectable quantities	Collectable quantities are estimated by the Ministry and the PRO to be 50% of the quantities put on the market.
Collected quantities	<ul style="list-style-type: none"> • Owners of waste oils and all those who manage waste oils are obliged to keep a Register of Origin and Flow of Waste Oils (ONTOU), as well as records of all flows they have been handling. • In order to finance collectors, the FZOEU demands a report from treatment operators, assessing the received quantities of waste oil (excluding water content). Those quantities are then used by the FZOEU as baseline for the financing of collection operators. • Reviewing of the quantities and nature of collected waste oils by the FZOEU takes place every three months.
Non-collected collectible waste oils	No available data

Final Report

Waste oils quality assessment	<ul style="list-style-type: none"> Waste holders must give completed supporting sheets related to the quantities and origin of waste oils to collectors during collection. Those sheets must then be certified by the collector.
Quantities per type of treatment and destination	<ul style="list-style-type: none"> Treatment operators must keep records of quantities and types of oils they handle, as well as offer certification that the oils have been treated according to law
Treatment	
Geographical destination specify regional / national / Eu-wide	
Regeneration	<p>Eu-wide</p> <p>Exporting for regeneration is however more expensive than inland recovery, by cement plants for instance, according to collection actors.</p>
Processed into fuel	National
Cement/lime kilns	Regional
Power plants	NA
HWI	National
Other	NA
Illegal collection and treatment	
Fate of non-collected collectible oil	<ul style="list-style-type: none"> Exported (eg. via functional vehicles leaving the country) Consumed for domestic heating
Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	<p>Unknown.</p> <p>Illegal shipments of waste oils are rare according to collection actors because the market situation is favourable to inland energy recovery. Furthermore and compared to other member states, the EPR scheme and national legislation are fairly loose in that regard, implying most shipment actions taking place are not illegal.</p>
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	<p>Illegal disposal of waste oils in waters used to be frequent, but has become rare since the EPR was set up and collection became free of charge for waste holders.</p>
Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)	<p>Black market selling of waste oils for house heating is said to be the most common form of illegal treatment of waste oils.</p>
Legal status	<p>Ordinance on waste oil management – NN 124/06</p> <p>Discharge into waters or harmful disposal or recovery (according to prescribed levels of pollution) of waste oils are forbidden, including for house heating and small burners.</p> <p>More generally, any action related to waste oil management that has a negative effect on either the environment or human health is forbidden.</p>

Final Report

Quantities / proportion treated that way	Unavailable data
Number of incidents reported	Unavailable data
Actors	
Competent public authorities	MINGOR (Ministarstvo gospodarstva i održivog razvoja – Ministry of sustainable development and economy)
Producer Responsibility Organisation	Environmental Protection and Energy Efficiency Fund (FZOEU). The organisation is not specific to waste oil collection, and active in other sustainability and waste-related management plans.
Key re-refiners	<p>Only one company has a concession for material recovery of oils in Croatia: KEMO. Their main activity is not re-refining, however, but mostly the production of virgin oil. INA has also seemingly initiated refining activities as part of its production processes.</p> <p>Regeneration is however said to be almost non-existent nation-wide by collection actors and according to past reports from the PRO (up to 2020).</p>
Key collectors	<p>14 collectors are authorized as part of the PRO system. The three biggest collectors in regard to collected quantities are:</p> <ul style="list-style-type: none"> • CIAK (30.5% of collected quantities), active everywhere in Croatia • CIAN (18.6% of collected quantities), mostly active in the southern part of Croatia • Val-Int (12.8% of collected quantities)
Key producers	Unknown
Bibliography	
Literature/documents/annual reports	<p>- Croatian Experience in Waste Oil Management (2014) Sofilic et al. Ecologica Balkanica p109-119.</p> <p style="text-align: center;"> Croatian experience in waste oil manage</p> <p>- HAOP (2016) Izvjesce o posebnim kategorijama otpada za 2016 (Report on special categories of waste for 2016)</p> <p style="text-align: center;"> Haop - Report on special categories of</p> <p>- MINGOR (2021) Pregled podataka o gospodarenju otpadnim uljima za 2020 (Review of data on waste oil management for 2020)</p> <p style="text-align: center;"> Mingor - Review of data on waste oil m</p> <p>Croatia Environmental Performance Reviews: Second Review (2014) United Nations</p>

	 Croatia Environmental Perfc
Contacted stakeholders	CIAN (waste oil collector)

Conclusion

The Ordinance on Waste Oil Management declared in 2006 allowed for better structuration of waste oil collection objectives and imperatives than previous collection schemes active in Croatia. Both waste holders and collection actors were from then on informed of what standards and requirements were to be followed in order to increase collection rates and optimize the quality of collected oils, notably through conditions regarding storage, traceability and transportation of different types of oils. Based on previous periods from 2012 to 2021 for which this data was available (and on estimates by collection actors), collection rates seem to follow a positive trend and to be steadily increasing.

Waste oil collection in Croatia is however said by both public authorities and collection actors to be negatively affected by an overall lack of education of stakeholders (notably waste holders) about the issues surrounding waste oil collection, and waste management in general. Furthermore, and according to analysed public reviews on reports, good practices and requirements related to those topics should be further communicated and propagated among stakeholders.

For now and even though regeneration treatments are strongly encouraged by law, very few regeneration facilities have the capacity to treat waste oils in Croatia, and most of the collected waste oils are directed towards the cement sector. According to collection actors and because of the prices offered by the cement industry, this recovery pathway is much more profitable to them as of today. The development of regeneration options should therefore be considered with the interests of collectors in mind, in order for there to be a shift within the waste oil treatment activities.

The collection scheme defined through the 2006 ordinance has been likened to (and sometimes treated as) an EPR scheme by interrogated actors and within studied literature, with the FZOEU seemingly taking the role of a PRO. However, as both producer fees and financings given to collectors are fixed in the ordinance and can only be adapted through following amendments, little to no flexibility (for instance in regard to market fuel or waste oil selling prices) is allowed. Furthermore, financings given to collectors are not sufficient to cover for net collection and storage costs, and most of the collection actors' activities depend on the selling of waste oils for recovery. Currently, waste oil collection is therefore primarily regulated by market-based factors in Croatia.

8.2.3. Estonia

Estonia has little waste oil production. The country does not have an EPR system nor a dedicated waste oil collection system. The collection is performed randomly by various entities as provided below.

Given this situation, Estonia does not have re-refineries and collected waste oils are exported to Finland for treatment. Nevertheless, some limited recovery operations of waste oils can be performed by entities collecting and storing the waste oils. In case waste oils follow a recovery operation or recycling operations, the fuel component may be used as an additive in the production of liquid fuels. This operations needs to be conducted in line with the environmental protection permit granting the right to handle the waste transferred.

The research team faced limitation during its data collection. Elements provided in this factsheets were provided mainly by experts from the Estonian Ministry of Environment and legislation.

Country															
General data															
Population	1,331,796 ¹²⁰														
Population density (per km ²)	30.9														
GDP per capita (€/capita)	41,932 ¹²¹														
EPR system (yes/no)	No														
Start date of the EPR	N/A														
Voluntary/mandatory	N/A														
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	<table border="1"> <tr> <td>N/A</td> <td>Engine and gear box oil</td> </tr> <tr> <td>N/A</td> <td>Industrial oil</td> </tr> <tr> <td>N/A</td> <td>Metal working oils and other oils leading to emulsions</td> </tr> <tr> <td>N/A</td> <td>2-stroke engine oil (lost oils)</td> </tr> <tr> <td>N/A</td> <td>Lubricants sold inside vehicles</td> </tr> <tr> <td>N/A</td> <td>Marine engine lubricating oil</td> </tr> <tr> <td>N/A</td> <td>Greases</td> </tr> </table>	N/A	Engine and gear box oil	N/A	Industrial oil	N/A	Metal working oils and other oils leading to emulsions	N/A	2-stroke engine oil (lost oils)	N/A	Lubricants sold inside vehicles	N/A	Marine engine lubricating oil	N/A	Greases
N/A	Engine and gear box oil														
N/A	Industrial oil														
N/A	Metal working oils and other oils leading to emulsions														
N/A	2-stroke engine oil (lost oils)														
N/A	Lubricants sold inside vehicles														
N/A	Marine engine lubricating oil														
N/A	Greases														
Scope – exempted producers	N/A														
PRO(s) name(s)	N/A														
Existence of a central register of producer	N/A														
entity/ies in charge of feeding it	N/A														
entity/ies in charge of controlling the register	<table border="1"> <tr> <td>N/A</td> <td>PRO</td> </tr> <tr> <td>N/A</td> <td>Environmental agency</td> </tr> <tr> <td>N/A</td> <td>Environmental ministry</td> </tr> <tr> <td>N/A</td> <td>Tax agency</td> </tr> </table>	N/A	PRO	N/A	Environmental agency	N/A	Environmental ministry	N/A	Tax agency						
N/A	PRO														
N/A	Environmental agency														
N/A	Environmental ministry														
N/A	Tax agency														
Legislation															
EPR / collection schemes	According to interviewed stakeholders Estonia does not have a an well organised waste oil collection system. The waste oils														

¹²⁰ ["Population Figure"](#). Statistics Estonia. Retrieved 12 May 2022.

¹²¹ ["World Economic Outlook Database, April 2022"](#). International Monetary Fund. International Monetary Fund. Retrieved 21 April 2022.

Final Report

	are collected separately at waste treatment operators, local government waste treatment plans, repair garages, harbours, inland harbours, SMEs and industry etc.
Quality standards	N/A
Collection	The Estonian Environmental Investment centre ¹²² is giving a grant for local governments to organize hazardous waste collection from households for free.
Mixing: bans and conditions	According to Waste Act Chapter 3 ¹²³ it is prohibited to mix hazardous waste.
Treatment	In line with EU law, for hazardous waste treatment it is required to have a permit as indicated in ¹²⁴ . Waste Act §985 ¹²⁵ - waste permit for recovery and disposal of hazardous waste.
Export	According to §110 of Waste Act ¹²⁶ . Transport permit for hazardous waste is regulated by international agreements. Transport permit stands for a document granting the right to import into or export from the Republic of Estonia hazardous waste or waste regulated by an international agreement or specified in Regulation (EC) N. 1013/2006 of the European Parliament and of the Council or pass such waste in transit through the territory of the Republic of Estonia. In the absence of the implementing act of the European Commission, the minister responsible for the area established a regulation. Regulation sets the criteria for the end-of-waste status for waste oil. (Õli sisaldavate jäätmete jäätmeteks oleku lakkamise kriteeriumid–Riigi Teataja). ¹²⁷ 489.44 tonnes exported mainly to Finland ¹²⁸ (roughly 9% of waste oil placed on market).
End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	Regarding the end-of waste criteria, the Waste Act in its §2(1) ¹²⁹ provides a general framework aligned with the WFD. According to this provision waste shall cease to be waste when it has undergone recycling or other recovery operations and complies with the following conditions at the same time: 1) the substance or object is commenced to be commonly used for a certain specific purpose; 2) a market or demand exists for such a substance or object; 3) the substance or object fulfils the technical requirements for the specific purpose and meets the legislation and product standards; 4) the use of the substance or object will not lead to adverse environmental or human health impacts.

¹²² <https://www.kik.ee/en>

¹²³ Waste Act 2004 Chapter 3 <https://www.riigiteataja.ee/en/eli/520012015021/consolide>

¹²⁴ Waste Act §985 - Waste permit for recovery and disposal of hazardous waste

¹²⁶ Waste Act 2004 §110 <https://www.riigiteataja.ee/en/eli/520012015021/consolide>

¹²⁶ Waste Act 2004 §110 <https://www.riigiteataja.ee/en/eli/520012015021/consolide>

¹²⁷ GIER Survey: Estonia.

¹²⁸ Information provided by ministry stakeholder.

¹²⁹ Waste Act 2004 §21(1) <https://www.riigiteataja.ee/en/eli/520012015021/consolide>

Final Report

	Furthermore, the Regulation of the Minister of the Environment of 3 rd of June 2019, provides further criteria for the cessation end-of-the waste criteria specific to 'waste containing oil'. According to §3 waste containing oil shall cease to be waste if it has undergone a recovery operation, including recycling, and the producer of the fuel component complies with the requirements as an additive in the production of liquid fuels, if it meets the quality characteristics set out in Annex 2 of this Regulation. ¹³⁰												
Waste oils mass flow													
Quantities placed on the market (t)	8,580.6 t Specify scope: 3,965.14 (Engine and gear box oil) ¹³¹ 4,497.29 (industrial oils) ¹³² 118.22 (industrial oil (emulsions only)) ¹³³												
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	5,495 ¹³⁴												
Collected quantities (t)	3,763.1 (dry oil) ¹³⁵												
Regeneration %	N/A												
Processed fuel oil %	N/A												
Cement/lime kilns %	N/A												
Power plants %	N/A												
HWI %	N/A												
Other %	N/A												
Collection													
Type of collected waste oils inside the collection / EPR scheme	<table border="1"> <tr> <td>Y</td> <td>Engine and gear box oil</td> </tr> <tr> <td>Y</td> <td>Industrial oil</td> </tr> <tr> <td>Y</td> <td>Emulsions</td> </tr> <tr> <td>N</td> <td>Marine lubricating oil (separately)</td> </tr> <tr> <td>N</td> <td>Marine slop oils (mixed with fuels)</td> </tr> </table>	Y	Engine and gear box oil	Y	Industrial oil	Y	Emulsions	N	Marine lubricating oil (separately)	N	Marine slop oils (mixed with fuels)		
Y	Engine and gear box oil												
Y	Industrial oil												
Y	Emulsions												
N	Marine lubricating oil (separately)												
N	Marine slop oils (mixed with fuels)												
Type of waste holders in the collection /EPR scheme	<table border="1"> <tr> <td>Y</td> <td>Recycling centres / municipalities</td> </tr> <tr> <td>Y</td> <td>Garages</td> </tr> <tr> <td>Y</td> <td>Harbours</td> </tr> <tr> <td>Y</td> <td>Inland harbours</td> </tr> <tr> <td>Y</td> <td>Small companies (e.g. farms, SMEs...)</td> </tr> <tr> <td>Y</td> <td>Industries</td> </tr> </table>	Y	Recycling centres / municipalities	Y	Garages	Y	Harbours	Y	Inland harbours	Y	Small companies (e.g. farms, SMEs...)	Y	Industries
Y	Recycling centres / municipalities												
Y	Garages												
Y	Harbours												
Y	Inland harbours												
Y	Small companies (e.g. farms, SMEs...)												
Y	Industries												
Existence of intermediate storage / pre-treatment facilities	As Estonia does not have a dedicated collection system, as intermediate storage can be considered entities which collect												

¹³⁰ The Regulation of the Minister of the Environment of 3rd of June 2019, Criteria for the cessation of waste containing oil, available at: [Criteria for the cessation of waste containing oil – Riigi Teataja](#).

¹³¹ Information provided by ministry stakeholder.

¹³² Information provided by ministry stakeholder.

¹³³ Ibid.

¹³⁴ Ibid.

¹³⁵ Ibid.

	waste separately : Waste Management Organizations (WMOs), end-of-life vehicle (ELV) recyclers, repair garages etc. have intermediate storage and two WMOs have pre-treatment facilities to remove water from oil. ¹³⁶
Collection conditions depending on stakeholders	<p>A waste holder is required to handle the waste according to the established requirements or transfer the waste for handling to a person holding the environmental protection permit. Waste holders must have adequate information concerning the types, quantities, and origin of the waste in their possession, concerning its properties relevant in terms of waste handling, and concerning the hazards resulting from the waste to health, the environment or property.</p> <p>Furthermore, the Regulation of the Minister of the Environment of 3rd of June 2019, provides in § 4 following requirements to be respected by the waste treatment facility:</p> <ul style="list-style-type: none"> - be surrounded by a fence - equipped with surveillance equipment or round-the-clock surveillance; - provided with a watertight coating; - provided with a stormwater collection system; - provided with an oil trap; - provided with a technological wastewater treatment system.¹³⁷
Free collection for waste holders	No
Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)	<p>A person transferring waste must be convinced that the transferee holds the environmental protection permit granting the right to handle the waste transferred. The consignment note for hazardous waste is a document which contains information concerning the type, composition, quantity and main properties of the hazardous waste transferred for handling and the producer of such waste, the person who transfers the waste for handling, the transport operator and the consignee. A consignment note shall be prepared for the transport of hazardous waste before the start of the transport as a digital document in the database of consignment notes for hazardous waste.</p> <p>Waste Act §65¹³⁸ provides further details on collection conditions:</p> <p>(3) If this is technically feasible, waste oils are collected separately.</p> <p>(4) Types of waste oils of different characteristics shall not be mixed with each other or with other types of waste or</p>

¹³⁶ Ibid.

¹³⁷ The Regulation of the Minister of the Environment of 3rd of June 2019, Criteria for the cessation of waste containing oil, available at: [Criteria for the cessation of waste containing oil – Riigi Teataja](#).

¹³⁸ Waste Act 2004 §651, available at: <https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/517062022005/consolide>

Final Report

	<p>substances if such mixing prevents their regeneration or other recycling operations.</p> <p>(5) Upon recovery of waste oils, regeneration of waste oils or other recycling operations delivering an equivalent or a better overall environmental outcome than regeneration must be preferred, taking into account the provisions of subsection 2 of § 22 of this Act</p>						
Involvement of treatment operators in collection activities / schemes	The entities collecting waste oils, to a limited extent, are involved in fuel preparation according to the Regulation of the Minister of the Environment of 3 rd of June 2019 providing Criteria for the cessation of waste containing oil.						
Geographical coverage	N/A						
Quality							
Separate collection of waste oils of different quality / composition	Waste Act §651(3) ¹³⁹ : If this is technically feasible, waste oils are collected separately.						
Key actions of the EPR / collection scheme to improve waste oil quality for regeneration	N/A						
End-treatment depending on quality	The Regulation of the Minister of the Environment of 3 rd of June 2019, provides criteria for the cessation end-of-the waste criteria specific to 'waste containing oil'. According to §3 waste containing oil shall cease to be waste if it has undergone a recovery operation, including recycling, and the producer of the fuel component complies with the requirements as an additive in the production of liquid fuels, if it meets the quality characteristics set out in Annex 2 of this Regulation . ¹⁴⁰						
Financing							
Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees	According to consulted stakeholders the system does not impose and fees and taxes, hence does not generate revenues.						
Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions	The system does finance the waste oil treatment. Waste holders cover the cost of collection and treatment.						
Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions	There is no financial instrument to stimulate the waste oils collection and treatment.						
Instruments to finance collection in isolated / remote areas	<table border="1" style="width: 100%;"> <tr> <td></td> <td>Differentiated fee scale</td> </tr> <tr> <td></td> <td>Financing transport cost</td> </tr> <tr> <td>Y</td> <td>Local government waste rounds</td> </tr> </table>		Differentiated fee scale		Financing transport cost	Y	Local government waste rounds
	Differentiated fee scale						
	Financing transport cost						
Y	Local government waste rounds						

¹³⁹ Waste Act 2004 §651 <https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/517062022005/consolide>

¹⁴⁰ The Regulation of the Minister of the Environment of 3rd of June 2019, Criteria for the cessation of waste containing oil, available at: [Criteria for the cessation of waste containing oil – Riigi Teataja](#).

Final Report

Instruments to adapt financing to oil prices	None.								
Reporting: procedure for reporting, verifications / audits	The survey answer provided that WMO are obliged to submit a general report on waste they handle. In addition, the Estonian Environmental Agency keeps a record of waste management statistics. ¹⁴¹								
Collectable quantities	Maintenance of records on waste, Reporting on waste to the Environmental Board once a year.								
Collected quantities	Maintenance of records on waste, Reporting on waste to the Environmental Board once a year.								
Non-collected collectible waste oils	Maintenance of records on waste, Reporting on waste to the Environmental Board once a year.								
Waste oils quality assessment	Maintenance of records on waste, Reporting on waste to the Environmental Board once a year.								
Quantities per type of treatment and destination	Maintenance of records on waste, Reporting on waste to the Environmental Board once a year.								
Costs									
Collection cost Breakdown by: OPEX into labour, insurance/maintenance, and fuel- for-collection costs CAPEX if possible	N/A								
Selling prices to treatment facilities (specify w or w/o transport)	<table border="1"> <tr> <td>N/A</td> <td>Regeneration</td> </tr> <tr> <td>N/A</td> <td>Cement /lime kilns / power plants</td> </tr> <tr> <td>N/A</td> <td>Process fuel oil production</td> </tr> <tr> <td>N/A</td> <td>HWI</td> </tr> </table>	N/A	Regeneration	N/A	Cement /lime kilns / power plants	N/A	Process fuel oil production	N/A	HWI
N/A	Regeneration								
N/A	Cement /lime kilns / power plants								
N/A	Process fuel oil production								
N/A	HWI								
Price determinants including quality and end-treatment	N/A								
Treatment									
Geographical destination specify regional / national / Eu-wide	Treatment is performed by WMO in Estonia								
Regeneration	Performed in Finland (9% of waste oil is exported)								
Processed fuel oil	N/A								
Cement/lime kilns	N/A								
Power plants	N/A								
HWI	N/A								
Other	N/A								
Illegal collection and treatment									
Fate of non-collected collectible oil	N/A								

¹⁴¹ Available at: <https://jats.keskkonnainfo.ee/main.php?page=content&content=summary>

Final Report

Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	Transported with ELVs, transported as fuel.
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	According to consulted stakeholders, this is very rare, and the occurrence of illegal disposal is decreasing.
Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)	Inspectors have not identified these situations. ¹⁴²
Legal status	N/A
Quantities / proportion treated that way	N/A
Number of incidents reported	N/A
Actors	
Competent public authorities	Ministry, Environmental Board, Inspectors
Producer Responsibility Organisation	None
Key re-refiners	N/A
Key collectors	N/A
Key producers	N/A
Bibliography	
Literature/documents/annual reports	Waste Act ¹⁴³ , Environmental Charges Act ¹⁴⁴ , Nature Conservation Act ¹⁴⁵ The Regulation of the Minister of the Environment of 3 rd of June 2019 on criteria for the cessation of waste containing oil.
Contacted stakeholders	Ministry Stakeholders, Industry Stakeholders (Ragn Sells AS)
Data for Task 2	
Average collection cost (€/t)	N/A
Number of waste oil collection points	As indicated, not reported as Estonia does not have a structured waste oil collection system. Different entities are allowed to collect/ store waste oil.
Average transport speed (km/h) for collection	N/A
Average collected quantity per collection point (t)	N/A
Average transport distance (km)	N/A
Regeneration	N/A
Processed fuel oil	N/A
Cement/lime kilns	N/A
Power plants	N/A

¹⁴² Information provided by ministry stakeholder.

¹⁴³ Ibid.

¹⁴⁴ Environmental Charges Act 2005

<https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/517062022004/consolide>

¹⁴⁵ Nature Conservation Act 2004 <https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/513072022001/consolide>

Final Report

	HWI	N/A
	Other	N/A
Regeneration capacities (t)		N/A
Current use of regeneration capacities (t)		N/A
Elasticities for price instruments policy measures		N/A

8.2.4. Finland

Although Finland represents a country of important size, the extent of oil production and waste oil treatment is rather small with large difference between the production and treatment. Although the waste oil production exists in the Northern part, the location of refineries is not equally balanced within the country between its Northern and Southern part. The waste oil refineries are located mostly in the southern, more densely populated part of the country. The performed interviews pointed out that the Finnish system is efficient and works well, mostly thanks to a close collaboration between the Ministry of the Environment and the industry stakeholders. The waste oil management system is characterised by its growing performance since 2014.¹⁴⁶

From 2018, waste oil management in Finland operates under market conditions. The collection and treatment of oil waste is still governed by Finnish and EU legislation.

In addition, in March 2019, the Ministry of Environment signed a Green Deal Agreement on the development of national waste oil management, which aims at improving the collection of waste oils across Finland and to increase its recycling rate.¹⁴⁷ This nationwide agreement was signed by Finnish Environmental Industries YTP and the Ministry of the Environment. The agreement is foreseen to last until 2024. While during the period 2010-2016, on average, 36,000 tons of waste oils were processed, and recycling accounted for 74%, the Green Deal agreement aims at keeping the amount of waste oils processed at the same level while increasing the share of recycling to at least 80% from 2020 onwards.¹⁴⁸

Country	
General data	
Population	5,531,000 ¹⁴⁹
Population density (per km ²)	16
GDP per capita (€/capita)	45,650 ¹⁵⁰
EPR system (yes/no)	No
Start date of the EPR	N/A
Voluntary/mandatory	N/A
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	N/A Engine and gear box oil
	N/A Industrial oil
	N/A Metal working oils and other oils leading to emulsions
	N/A 2-stroke engine oil (lost oils)
	N/A Lubricants sold inside vehicles
	N/A Marine engine lubricating oil
	N/A Greases
Scope – exempted producers	N/A
PRO(s) name(s)	N/A

¹⁴⁶ Kapustina et al., System analysis of waste oil management in Finland, 2014, available at: https://www.researchgate.net/publication/260557452_System_analysis_of_waste_oil_management_in_Finland

¹⁴⁷ Sitoumus2050, Green deal agreement on the development of national oil waste management, available at: [https://sitoumus2050-fi.translate.google/en_US/oljyjatehuolto? x_tr sl=auto& x_tr tl=en& x_tr hl=pl& x_tr pto=wapp#/.](https://sitoumus2050-fi.translate.google/en_US/oljyjatehuolto? x_tr sl=auto& x_tr tl=en& x_tr hl=pl& x_tr pto=wapp#/)

¹⁴⁸ Ibid.

¹⁴⁹ Preliminary population statistics. Statistics Finland, accessed 7. Juni 2022

¹⁵⁰ BIP pro Kopf (nominal). In: IMF World Economic Outlook. 2020, accessed 4. April 2022.

Final Report

Existence of a central register of producer	N/A
entity/ies in charge of feeding it	N/A
entity/ies in charge of controlling the register	N/A PRO
	N/A Environmental agency
	N/A Environmental ministry
	N/A Tax agency
Legislation	
EPR / collection schemes	The collection scheme is based on the Waste Act (646/2011) ¹⁵¹ and Waste Decree (179/2012) ¹⁵² . Treatment of oil waste must be organised in accordance with sections 8 and 13 of the Waste Act. Additional provisions on the incineration of oil waste are given in the Government Decree on the incineration of waste (362/2003) and section 6 of the Government decision on management of oil waste (101/1997). ¹⁵³
Quality standards	N/A
Collection	A professional handling of waste (oils) requires an environmental permit, and waste oils are collected by professional actors (the permit is handled in accordance with its specification in the Finnish Green Deal Agreement) ¹⁵⁴
Mixing: bans and conditions	The Waste law prohibits mixing wastes to proportionally reduce hazardous content.
Treatment	N/A
Export	N/A
End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	If waste oil has sufficient quality to be converted into oil that can be marketable (so depending on the demand of the market). The criteria are hence not fixed but depend on the market demand for waste oil (where demand for quality can be volatile due to the oil price for virgin oil).
Waste oils mass flow	
Quantities placed on the market (t)	137,262 t (average 2013-2018) ¹⁵⁵
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	33,600 t (24%) ¹⁵⁶
Collected quantities (t)	33,600 t + 5,000 t imported ¹⁵⁷
Regeneration %	56%
Processed fuel oil %	N/A
Cement/lime kilns %	N/A
Power plants %	N/A

¹⁵¹ [646/2011 English - Translations of Finnish acts and decrees - FINLEX ®](#)

¹⁵² [179/2012 English - Translations of Finnish acts and decrees - FINLEX ®](#)

¹⁵³ <http://extwprlegs1.fao.org/docs/pdf/fin113535.pdf>

¹⁵⁴ [Öljyjätehuolto - Sitoumus2050](#)

¹⁵⁵ Information provided by ministry stakeholder.

¹⁵⁶ Information provided by ministry stakeholder.

¹⁵⁷ Information provided by ministry stakeholder.

Final Report

HWI %	N/A												
Other %	N/A												
Collection													
Type of collected waste oils inside the collection / EPR scheme	<table border="1"> <tr> <td>Y</td> <td>Engine and gear box oil</td> </tr> <tr> <td>Y</td> <td>Industrial oil</td> </tr> <tr> <td>Y</td> <td>Emulsions</td> </tr> <tr> <td>Y</td> <td>Marine lubricating oil (separately)</td> </tr> <tr> <td>Y</td> <td>Marine slop oils (mixed with fuels)</td> </tr> </table>	Y	Engine and gear box oil	Y	Industrial oil	Y	Emulsions	Y	Marine lubricating oil (separately)	Y	Marine slop oils (mixed with fuels)		
Y	Engine and gear box oil												
Y	Industrial oil												
Y	Emulsions												
Y	Marine lubricating oil (separately)												
Y	Marine slop oils (mixed with fuels)												
Type of waste holders in the collection /EPR scheme	<table border="1"> <tr> <td>Y</td> <td>Recycling centres / municipalities</td> </tr> <tr> <td>Y</td> <td>Garages</td> </tr> <tr> <td>N</td> <td>Harbours</td> </tr> <tr> <td>N</td> <td>Inland harbours</td> </tr> <tr> <td>Y</td> <td>Small companies (e.g. farms, SMEs...)</td> </tr> <tr> <td>Y</td> <td>Industries</td> </tr> </table>	Y	Recycling centres / municipalities	Y	Garages	N	Harbours	N	Inland harbours	Y	Small companies (e.g. farms, SMEs...)	Y	Industries
Y	Recycling centres / municipalities												
Y	Garages												
N	Harbours												
N	Inland harbours												
Y	Small companies (e.g. farms, SMEs...)												
Y	Industries												
Existence of intermediate storage / pre-treatment facilities	Both collectors and re-refineries have intermediate storage and pre-treatment facilities.												
Collection conditions depending on stakeholders	N/A												
Free collection for waste holders	The waste oil from households is collected free of charge to waste collection facilities. However, the municipalities pay the disposal fee to the collection company for this service since the oil quality is typically low ¹⁵⁸ . The municipalities collect a green tax paid by each household. The green tax includes the waste oil disposal fee as well as other costs related to the hazardous waste collection and recycling point maintenance and operation.												
Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)	The Ministry of the Environment controls the waste oil collection and treatment by signing a long-duration (5 years) agreement with a waste collection company. The company is chosen by the public procurement procedure. As a direct result of the agreement, the company shares a nationwide responsibility to supervise the collection and handling of waste oil and to deliver it to appropriate processors (regeneration plant, hazardous waste incineration plant, reprocessing plant, and re-refinery plant) ¹⁵⁹ .												
Involvement of treatment operators in collection activities / schemes	N/A												
Geographical coverage	There is considerable difference between the northern and the southern part of the country, as all the re-refineries are based in the south. This results in that waste oil from the north has to be transported up to 800 km. However, the generation of												

¹⁵⁸ Fitzsimons D, Eatherley D and Rasanen J. (2009) Analysis of used oil policy management options, for the waste authority, Western Australia. Aylesbury, Oakdene Hollins. Available at: www.wasteauthority.wa.gov.au/media/files/documents/analysis_used_oil_policy_management_options.pdf (last accessed 11 June 2013)

¹⁵⁹ Kapustina, V., et al. "System analysis of waste oil management in Finland." Waste Management & Research 32.4 (2014): 297-303.

Final Report

	<p>waste oil in the north represent only a small percentage of the overall waste oil.¹⁶⁰</p> <p>The waste oil processors pay to the main transportation companies (see below) for the delivering of waste oil. The prices for waste oil delivery are the same for all processors¹⁶¹.</p>						
Quality							
Separate collection of waste oils of different quality / composition	In case the quality of the oil is good enough (according to the companies own assessment of the quality that can be sold on the market), the collector will pay for it, otherwise the producer has to take over the cost.						
Key actions of the EPR / collection scheme to improve waste oil quality for regeneration	<p>Not specific.</p> <p>The collection site operators and large industrial waste producers pay a disposal fee if the waste oil is of low quality due to the contamination with more than 10% water and other foreign particles, regardless of the volume collected.¹⁶²</p>						
End-treatment depending on quality	N/A						
Financing							
Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees	<p>Producers and importers of lubricant oils have to pay a fee on lubricant oils and greases. The resulting funds are used for collection, transport, storage and treatment of waste oils. Furthermore, a part of the revenues is also used for the depollution of oil-contaminated soil and groundwater. The waste oil transportation system is supported by a subsidy from a fund managed by the Ministry of the Environment. This fund has accumulated from the waste oil charge on the cost of the new lubricant sold. The exported oils are exempted from the waste oil charge, as well as such lubricant oils which are wholly consumed during use (Ministry of the Environment, 2013).</p>						
Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions	In some cases, waste oil management companies buy good quality waste oils that can be regenerated. If the quality of the waste oil is lower than that standard determined by the companies, then the waste producer has to pay for collection and treatment.						
Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions							
Instruments to finance collection in isolated / remote areas	<table border="1" style="width: 100%;"> <tr> <td style="width: 50px; text-align: center;">Y</td> <td>Differentiated fee scale</td> </tr> <tr> <td style="text-align: center;">Y</td> <td>Financing transport cost</td> </tr> <tr> <td></td> <td></td> </tr> </table>	Y	Differentiated fee scale	Y	Financing transport cost		
Y	Differentiated fee scale						
Y	Financing transport cost						
Instruments to adapt financing to oil prices	The main transportation company received EUR 2.05 million of waste oil subsidy in 2007. This was slightly lower than the subsidy in 2006 (EU 2.6 million) because of the increasing						

¹⁶⁰ Information provided by ministry stakeholder.

¹⁶¹ Luoto M. (2012) Ekokem sales consultant. Letter exchanged 20 July 2012.

¹⁶² [Öljyjätehuolto - Sitoumus2050](#)

Final Report

	<p>efficiencies and possibly of the crude oil price rise in 2007 led to greater profits for the main transportation company¹⁶³. For the years 2008–2010, no subsidy was paid at all since income from selling waste oil exceeded expenses. In 2011, the subsidy payment amounted to EUR 0.3 million¹⁶⁴.</p>	
Reporting: procedure for reporting, verifications / audits		
Collectable quantities	30,240 t ¹⁶⁵	
Collected quantities	23,000 t ¹⁶⁶	
Non-collected collectible waste oils	7,240 t ¹⁶⁷	
Waste oils quality assessment	Performed by collectors and re-refineries	
Quantities per type of treatment and destination	N/A	
Costs		
Collection cost Breakdown by : OPEX into labour, insurance/maintenance, and fuel-for-collection costs CAPEX if possible	<p>Waste Oil Tax: 5,75 ct/tonne (Waste Oil Charge Act 894/1986)¹⁶⁸ Costs otherwise for collection are not disclosed by the individual companies</p>	
Selling prices to treatment facilities (specify w or w/o transport)	N/A	Regeneration
	N/A	Cement /lime kilns / power plants
	N/A	Process fuel oil production
	N/A	HWI
	100 -120 €/t	Not distinguished by treatment, including transport, range depending on the current oil price
Price determinants including quality and end-treatment	Oil price on the market and quality of the oil	
Treatment		
Geographical destination specify regional / national / Eu-wide	All the waste oil is treated nationally (with addition of imports), all refineries are located in the south	
Regeneration	Regional (South of Finland)	
Processed fuel oil	Regional (South of Finland)	
Cement/lime kilns	Regional (South of Finland)	
Power plants	Regional (South of Finland)	
HWI	Regional (South of Finland)	
Other	N/A	

¹⁶³ Fitzsimons D, Eatherley D and Rasanen J. (2009) Analysis of used oil policy management options, for the waste authority, Western Australia. Aylesbury, Oakdene Hollins. Available at: www.wasteauthority.wa.gov.au/media/files/documents/analysis_used_oil_policy_management_options.pdf (last accessed 11 June 2013)

¹⁶⁴ Peuranen E. (2012) Ministry of the Environment. Letter exchanged 3 December 2012.

¹⁶⁵ Information provided by ministry stakeholder.

¹⁶⁶ Information provided by ministry stakeholder.

¹⁶⁷ Information provided by ministry stakeholder.

¹⁶⁸ [894/1986 English - Translations of Finnish acts and decrees - FINLEX ®](#)

Final Report

Illegal collection and treatment	
Fate of non-collected collectible oil	It is assumed to be burnt in small incineration facilities.
Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	N/A
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	This is assumed not to be the case as there has not been found any evidence of contamination.
Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)	This is assumed to happen, especially when the oil price is low and collectors/re-refiners charge a higher price for the collection.
Legal status	1) Environmental Protection Act and Waste Act ¹⁶⁹ prevents illegal waste oil management. In addition, Decree on Waste Incineration ¹⁷⁰ includes a limitation concerning the incineration of oil waste. Oil waste is not allowed to be incinerated in a waste incineration plant or waste co-incineration plant with a maximum thermal input of five megawatts (5 MW). ¹⁷¹
Quantities / proportion treated that way	N/A
Number of incidents reported	N/A
Actors	
Competent public authorities	Ministry of Environment ¹⁷²
Producer Responsibility Organisation	No
Key re-refiners	STR Tecoil Oy ¹⁷³ , Savaterra Oy ¹⁷⁴ , Veikko Lehti Oy ¹⁷⁵
Key collectors	YTP (Industrial Association of Finnish Environmental Industries) ¹⁷⁶ , Fortum Waste Solutions Oy ¹⁷⁷ , Kierto Ympäeistopalvelut Oy ¹⁷⁸ , Lassila & Tikanoja Oy ¹⁷⁹
Key producers	STR Tecoil Oy ¹⁸⁰ , Savaterra Oy ¹⁸¹ , Veikko Lehti Oy ¹⁸²
Bibliography	
Literature/documents/annual reports	Finnish Green Deal, Waste Act, Waste Decree
Contacted stakeholders	Ministry Stakeholder (Ministry of Environment) Interview held on 1/7/2022, STR Tecoil Oy

¹⁶⁹ [Waste legislation - Ministry of the Environment \(ym.fi\)](#)

¹⁷⁰ [179/2012 English - Translations of Finnish acts and decrees - FINLEX ®](#)

¹⁷¹ Ibid.

¹⁷² [Front page - Ministry of the Environment \(ym.fi\)](#)

¹⁷³ [Base oil that's been around - STR Tecoil](#)

¹⁷⁴ [Nature Friendly Solutions \(savaterra.fi\)](#)

¹⁷⁵ [Veikko Lehti - Ratkaisut kotitalouksille - kiertotalouden ytimessä](#)

¹⁷⁶ <https://ytpliitto.fi/in-english/>

¹⁷⁷ [Fortum Waste Solutions Oy | Fortum](#)

¹⁷⁸ [Kierto - Jätteet kiertoon, jätteet hyötykäyttöön](#)

¹⁷⁹ [Frontpage - L&T \(lt.fi\)](#)

¹⁸⁰ [Base oil that's been around - STR Tecoil](#)

¹⁸¹ [Nature Friendly Solutions \(savaterra.fi\)](#)

¹⁸² [Veikko Lehti - Ratkaisut kotitalouksille - kiertotalouden ytimessä](#)

Final Report

Data for Task 2	
Average collection cost (€/t)	N/A
Number of waste oil collection points	N/A
Average transport speed (km/h) for collection	N/A
Average collected quantity per collection point (t)	N/A
Average transport distance (km)	N/A
Regeneration	N/A
Processed fuel oil	N/A
Cement/lime kilns	N/A
Power plants	N/A
HWI	N/A
Other	N/A
Regeneration capacities (t)	N/A
Current use of regeneration capacities (t)	N/A
Elasticities for price instruments policy measures	N/A

8.2.5. France

Country	France															
General data																
Population	67,390,000															
Population density (per km ²)	119															
GDP per capita (€/capita)	32,630 €/capita (2021)															
EPR system (yes/no)	Yes															
Start date of the EPR	January 1, 2022															
Voluntary/mandatory	Mandatory															
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	<table border="1"> <tbody> <tr> <td>Y</td> <td>Engine and gear box oil</td> </tr> <tr> <td>Y</td> <td>Industrial oil</td> </tr> <tr> <td>N</td> <td>Metal working oils and other oils leading to emulsions</td> </tr> <tr> <td>N</td> <td>2-stroke engine oil (lost oils)</td> </tr> <tr> <td>Y</td> <td>Lubricants sold inside vehicles</td> </tr> <tr> <td>N *</td> <td>Marine engine lubricating oil</td> </tr> <tr> <td>Y **</td> <td>Greases</td> </tr> </tbody> </table> <p>Lost and dissipated oils are also taken into account in capture rate calculations. The PRO may voluntarily include metal working oils and lost oils in the EPR scheme if producers agree to it. Brake fluids, hydrophilic oils and petrolatums are excluded.</p> <p>* Marine oils included in other international management systems, such as CDNI, Marpol...) are not part of EPR but other marine oils (leisure boats) are included. There is not yet experience regarding this differentiation in practice.</p> <p>** Though initially excluded from the EPR, greases have been added to the scope.</p> <p>Packaging is not part of the EPR scheme.</p>		Y	Engine and gear box oil	Y	Industrial oil	N	Metal working oils and other oils leading to emulsions	N	2-stroke engine oil (lost oils)	Y	Lubricants sold inside vehicles	N *	Marine engine lubricating oil	Y **	Greases
Y	Engine and gear box oil															
Y	Industrial oil															
N	Metal working oils and other oils leading to emulsions															
N	2-stroke engine oil (lost oils)															
Y	Lubricants sold inside vehicles															
N *	Marine engine lubricating oil															
Y **	Greases															
Scope – exempted producers	None															
PRO(s) name(s)	CYCLEVIA															
Existence of a central register of producers	Yes															
entity/ies in charge of feeding it	CYCLEVIA															
entity/ies in charge of controlling the register	<table border="1"> <tbody> <tr> <td>X</td> <td>PRO</td> </tr> <tr> <td>X</td> <td>Environmental agency</td> </tr> <tr> <td></td> <td>Environmental ministry</td> </tr> <tr> <td></td> <td>Tax agency</td> </tr> </tbody> </table>		X	PRO	X	Environmental agency		Environmental ministry		Tax agency						
X	PRO															
X	Environmental agency															
	Environmental ministry															
	Tax agency															
Legislation																

EPR / collection schemes	<p>Article 62 of law n°2020-105, February 10th 2020¹⁸³, relative to circular economy and the reduction of waste complying with WFD articles 8 & 8a (EPR) and 21 (waste oils)</p> <ul style="list-style-type: none"> • Free collection of waste oils from waste holders at any point in France, financed by PRO (payment of waste holders is not allowed) • Obligation for PROs to cover the costs of waste oil management whatever economic conditions (including collection, transport, regeneration and recycling) • Cover the costs of waste oil pollution/contamination when the responsible entity cannot be identified <p>Order of October 27th, 2021¹⁸⁴</p> <ul style="list-style-type: none"> • Specifications for the PRO to be designated within the EPR framework
Quality standards	<p>Order of October 27th, 2021</p> <ul style="list-style-type: none"> • The PRO is in charge of all measures aiming to ensure the quality and purity of collected oils, and to maximize their regeneration. • Quality criteria are established in agreements between PRO and collectors. Contaminated waste oil is not covered by the PRO if it cannot be regenerated and if the waste holder in charge of contamination can be identified.
Collection	<p>Art. R. 543-5 of the Environment Code¹⁸⁵:</p> <ul style="list-style-type: none"> - obligation for the collector to issue a removal order for the holder - obligation of a double sampling to identify the source of pollution of waste oils - traceability of waste oils as hazardous waste - further conditions are determined in contracts between PRO and collectors
Mixing: bans and conditions	<p>Art. R. 543-4 of the Environment Code¹⁸⁶:</p>

¹⁸³ <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000041553759/>

¹⁸⁴ <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000044264881>

¹⁸⁵ https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000044266494?init=true&page=1&query=R.+543-4&searchField=ALL&tab_selection=all

¹⁸⁶ https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000044266503?init=true&page=1&query=R.+543-4&searchField=ALL&tab_selection=all

	Separate collection and no mixing with other wastes, including waste oils with different characteristics
Treatment	Article 62 of law n°2020-105, February 10th 2020 ¹⁸⁷ , relative to circular economy and the reduction of waste complying with WFD articles 8 & 8a (EPR) and 21 (waste oils) Priority given to regeneration over energy recovery Regeneration targets
Export	<ul style="list-style-type: none"> - Application of the regulation (EC) no 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste¹⁸⁸ (+ specific competent authority dedicated to the application of this regulation) is in action. - Article L541-10-6¹⁸⁹: PROs must ensure traceability of every waste they manage, including if the end-of-life treatment takes place in foreign countries. No limitation is applied to quantities exported by PROs, as long as the waste is to be recovered (and not eliminated), and as long as traceability on said quantities, content, and destination of waste flows is ensured. - Authorization by both exporting and importing authorities is required as well, and applies to a defined and limited quantity of waste oil (if exceeded, new authorizations are required).
End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	The ministerial order of February 22, 2019 ¹⁹⁰ sets the criteria for an operator of an ICPE* classified under the heading 2770, 2771, 2790 or 2791, to be granted end-of-waste status for chemical products and objects that have been regenerated. Waste status is applied to waste oils but not to regenerated base oils.

¹⁸⁷ <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000041553759/>

¹⁸⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32006R1013&from=EN>

¹⁸⁹ https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000041599060?init=true&page=1&query=L541-10-6&searchField=ALL&tab_selection=all

¹⁹⁰ <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000038190409/>

Final Report

	<p>The ministerial order of July 10, 2017¹⁹¹ sets criteria for the end-of-waste of distillation residues for use as bitumen plasticizers in the manufacture of roofing membranes.</p> <p>*ICPE (Installation Classée pour la Protection de l'Environnement) designates facilities whose activities present potential health-related and/or environmental threats and which are therefore covered by a declaration, registration or authorization procedure, including environmental permits where applicable.</p>
Waste oils mass flow	
Quantities placed on the market (t)	<p>545,572 tons in 2021¹⁹², including:</p> <ul style="list-style-type: none"> • 53% of motor oils • 34% of industrial oils • 13% process oils •
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	<p>~67% of the mass of oils that generate waste oils</p> <p>~55% of the total mass of oils placed on the market (some industrial oils such as heat transfer fluids, compressor fluids or specific greases do not generate waste oils)¹⁹³</p> <p>Estimates of the quantities of oils placed on the market and eventually collectable are reported to be difficult, as the final utilization of those oils is not always clear</p>
Collected quantities (t)	222,659 tonnes in 2021

¹⁹¹ <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000035465656>

¹⁰ ADEME (2020) Note: Préparation des travaux de réflexion dans le cadre de la mise en place d'une filière REP appliquée aux huiles

¹¹ Centre Professionnel des Lubrifiants (C.P.L. ; 2021) Parution de la brochure Statistiques Lubrifiants 2020 (<http://cpl-lubrifiants.com/>)

* Capture rate = $\frac{\text{Collected volume of waste oils in 2019}}{\text{Volume of oils put on the French market in 2019}}$

** Collection rate = $\frac{\text{Collected volume of waste oils in 2021}}{\text{Estimated volume of collectable waste oils in 2021}}$
(Estimated volumes of collectable oils are calculated using emission coefficients for various types of oils formulated by BIO INTELLIGENCE SERVICE and ARIA CONSULT as part of a 2004 study for ADEME)

Final Report

	<p>Capture rate (based on quantities put on the market)* :</p> <p>- 41 % in 2021</p> <p>Collection rate (based on estimated collectable waste oil quantities)**:</p> <p>- 72.7% in 2021 ¹⁰</p> <p>Objectives for capture rates:</p> <p>50% in 2023, 53% in 2025, 55% in 2027</p> <p>Estimates for quantities of separately collected (and recycled) white oils : ~10,000 tonnes.</p> <p>NB: white oils are waste lubricating oils that remain clear after use (hydraulic oil, transformer oil...), unlike engine oil.</p>												
Regeneration %	<p>70.3% of the waste oil collected in 2021¹⁵</p> <p>(Objectives: 75% in 2023, 83% in 2025, 90% in 2027)</p> <p>Those objectives may exclude overseas territories.</p>												
Processed into fuel %	11.9% ¹⁰												
Cement/lime kilns %	10.4% ¹⁰												
Power plants %	~0% ¹⁰												
HWI %	1.4% ¹⁰												
Other %	6% ¹⁰												
Collection													
Type of collected waste oils inside the collection / EPR scheme	<table border="1"> <tr> <td>X</td> <td>Engine and gear box oil</td> </tr> <tr> <td>X</td> <td>Industrial oil</td> </tr> <tr> <td></td> <td>Emulsions</td> </tr> <tr> <td></td> <td>Marine lubricating oil (separately)</td> </tr> <tr> <td></td> <td>Marine slop oils (mixed with fuels)</td> </tr> </table> <p>NB: Lost oils and emulsions are not collected in the collection scheme but pay a fee.</p>	X	Engine and gear box oil	X	Industrial oil		Emulsions		Marine lubricating oil (separately)		Marine slop oils (mixed with fuels)		
X	Engine and gear box oil												
X	Industrial oil												
	Emulsions												
	Marine lubricating oil (separately)												
	Marine slop oils (mixed with fuels)												
Type of waste holders in the collection /EPR scheme	<table border="1"> <tr> <td>11%</td> <td>Recycling centres / municipalities</td> </tr> <tr> <td>51%</td> <td>Garages</td> </tr> <tr> <td>10%</td> <td>Public services</td> </tr> <tr> <td>9%</td> <td>Transport services</td> </tr> <tr> <td>8%</td> <td>Small companies (e.g. farms, SMEs...)</td> </tr> <tr> <td>11%</td> <td>Industries</td> </tr> </table>	11%	Recycling centres / municipalities	51%	Garages	10%	Public services	9%	Transport services	8%	Small companies (e.g. farms, SMEs...)	11%	Industries
11%	Recycling centres / municipalities												
51%	Garages												
10%	Public services												
9%	Transport services												
8%	Small companies (e.g. farms, SMEs...)												
11%	Industries												
Existence of intermediate storage / pre-treatment facilities	<p>Legally and since the EPR's instauration, regrouping collectors are distinguished from collectors, as they transport waste oils collected from the latter, regroup them and direct them towards regeneration or energy recovery.</p> <p>Before treatment, waste oils are stored in storage facilities (118 storage facilities, including 8 overseas)</p> <p>Most storage sites remove water within waste oils by simple decantation. Some overseas treatment sites</p>												

Final Report

	use centrifugation to optimize water removal, in order to increase transportation efficiency.
Collection conditions depending on stakeholders	Nothing specific
Free collection for waste holders	Yes. Waste holders may not be asked to pay for collection. Similarly, larger quantities of waste oils cannot be brought to waste holders by registered collection actors receiving EPR financial support.
Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)	<p>Before the EPR was in place, collectors could be registered to public authorities through departmental authorizations in the departments where they had intermediate storage facilities. They had an obligation to collect quantities in their department and could collect in a given geographical area around the department. With the EPR, collectors must be registered and contract with the PRO to receive support. They must collect in their department and are allowed to collect in neighbouring departments.</p> <p>Tenders were to be emitted in order to select collectors (linked to the PRO through objectives of collected quantities), and to adapt applicable financial support according to regional specificities. Other collectors could then register to the PRO according to the agreed fixed prices. Facing time constraints, financial support scale for collection, transport and treatment were established by the PRO after a market analysis. Further tenders may be launched in the future.</p> <p>Collection is financed only: for quantities over 200 l if some quality criteria for the waste oil are complied with (e.g. <5% water)</p> <p>Costs covered by the EPR scheme: Collection, transport, treatment Management of contaminated waste oils and of dealing with illegal deposits (littering) if the source of pollution cannot be identified (otherwise the polluter is held responsible for the entire contaminated batch). Cost of managing contaminated waste oils from municipalities is systematically covered. Collection and storage for energy recovery, in some cases</p>

<p>Involvement of treatment operators in collection activities / schemes</p>	<p>The 2 French regeneration facilities also handle collecting activities (notably VEOLIA also involved in regeneration via the joint venture OSILUB, and ECO-HUILE). There are other collectors which do not own regeneration facilities.</p>
<p>Geographical coverage</p>	<ul style="list-style-type: none"> · The entirety of Metropolitan France and overseas departments and territories are covered. · 2 collector groups handle collection all over the territory, while the other collectors generally cover more restricted areas. · Collectors respect the proximity principle by being contractually allocated a specific department (and in some cases, its bordering departments). Collection outside this perimeter is not supported by the EPR. · Additional financing of actors covering less accessible or less densely populated areas, as well as actors
<p>Quality</p>	
<p>Separate collection of waste oils of different quality / composition</p>	<p>White oils are collected separately in some areas because white oils are cheaper to collect and treat and have a much higher economic value. However, their mixing with black oils (motor oils from automotive and industrial sectors) does not affect black oil regeneration and is therefore not forbidden. Abnormally high collection rates for black oils and low collection rates for white oils indicate that such mixings happen regularly for two reasons:</p> <ul style="list-style-type: none"> it can be impractical and space-consuming for waste holders to gather and store white oils separately in sufficient quantities; a lot of collectors refuse to collect white oils separately because of the costs associated to the treatment and decontamination of trucks and containers that have been used to transport black oils. <p>Before the EPR was in place, workshops and industries already had to separate different waste flows (including waste oils), and mixing of different waste fluids is therefore uncommon today for those holders. Mixing with brake or cooling fluids can happen in workshops but is not frequent. Mixing is more common in waste disposal centres managed by municipalities, notably with vegetal food oils.</p>

	<p>Traces of chlorine and sulphur can be found in waste oils. They can be linked to the initial composition or treatment of oils, or to processes the oils have been used through (washing with chlorinated solvents). It is not clear whether the waste holder can be held responsible for such pollutions, as of today.</p> <p>The amounts of collected waste oils that are unfit for regeneration have been estimated to be around 5% of total collected quantities.</p>
<p>Key actions of the EPR / collection scheme to improve waste oil quality for regeneration</p>	<ul style="list-style-type: none"> · Waste holders are given a receipt by collectors testifying the quantity and quality of oils transferred · Two samples are taken from each collected batch by the collector. One is kept by the collector (or the waste holder in certain cases), the other one is given to the refiners. Both are linked to the initial receipt's reference. · National control actions by the environmental police (inspectors) to ensure that all waste oil management operations are carried out in an authorized facility. · All collectors must be registered with a PRO (Producers Responsibility Organism) : obligation of traceability to obtain financial support by the PRO to cover costs of collection, transport and treatment · EPR must finance collection, transport and treatment cost of contaminated waste oils when the source of contamination cannot be identified (incl. all contaminated waste oils from municipalities), and depollution of collection and transport equipment. · EPR must finance the depollution of an illegal waste oil deposit (littering) under conditions (specified in Article R541-113 -R541-115 of Environmental Code). However, this financial support is reserved to deposits of waste oils > 100 kg which are unlikely to cover observed illegal waste oil deposits. Financial support is limited to 80% of the cost of deposit management and conditioned to administrative procedure for local authorities. · Every actor managing waste oils must be registered to the PRO. · The PRO is asked to finance R&D studies meant to improve regeneration efficiency.

Final Report



	<ul style="list-style-type: none"> Waste oils gathered from potentially problematic sources (recurring polluters, airports, etc) are usually collected separately in order to avoid contamination of clean waste oils. 				
End-treatment depending on quality	<p>Only black oils are directed towards energy recovery.</p> <p>White oils can be treated via filtration for use notably as formwork oils, commonly applied to surfaces before concreting or used for the demoulding of cast pieces. Furthermore, their addition to black oils prior to regeneration treatments does not affect their efficiency.</p>				
Financing					
Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees	<p>As of 2022, EPR fee is 89 €/t of product.</p> <p>A modulation is set to be in place by the end of 2022 in order to adapt prices to categories of products. At least three criteria will be used in the calculations of fees directed towards the producers by the PRO:</p> <ul style="list-style-type: none"> The incorporation of recycled materials in the production process The hazardousness of products The award or not of a European Ecolabel related to lubricants <p>Each year, a revision of EPR fees will be considered.</p>				
Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions	<p>A majority of the budget (no quantitative data) is allocated to regrouping collectors. Another part of that budget is allocated to regeneration operators, and a lesser part of it is allocated to waste disposal facilities.</p> <p>Additionally:</p> <ul style="list-style-type: none"> 2% of the PRO's budget is allocated to information and awareness raising, at both local and national levels. 2% of the PRO's budget is allocated to funding research and development on the optimization of methods of regeneration and recycling of waste oils. 				
Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions	No available data found				
Instruments to finance collection in isolated / remote areas	<table border="1" style="width: 100%;"> <tr> <td style="width: 5%; text-align: center;">X</td> <td>Differentiated fee scale</td> </tr> <tr> <td></td> <td>Financing transport cost</td> </tr> </table> <p>Additional financing (following defined price scales) are given to collectors covering less populated areas.</p>	X	Differentiated fee scale		Financing transport cost
X	Differentiated fee scale				
	Financing transport cost				

Final Report

Instruments to adapt financing to oil prices	<p>The initial prices were fixed via analysis of market prices through internal studies by the PRO.</p> <p>Financial support scheme updated according to market conditions (ie. Prices for crude oil and collected waste oil) every 6 months.</p>
Reporting: procedure for reporting, verifications / audits	
Collectable quantities	<p>All information related to the monitoring of performance by the EPR will be communicated through an online tool dedicated to waste management. Information can then be immediately available to public authorities in charge of waste management (and ADEME, notably).</p> <p>The PRO is meant to give estimates of the collectable quantities within 3 years after the EPR's instauration, and objectives will then be potentially adapted.</p>
Collected quantities	All collectors must be registered with a PRO, with an obligation of traceability.
Non-collected collectible waste oils	No available data found
Waste oils quality assessment	Double sampling and specific analyses are done by regrouping-collectors to limit pollution of regenerated waste oils, notably for water content (not accepted by regeneration operators over 5%) and traces of PCB (not accepted over 50 ppm).
Quantities per type of treatment and destination	No available data found
Treatment	
Geographical destination specify regional / national / Eu-wide	Proximity principle applies for all actions of the PRO.
Regeneration	<p>EU-wide</p> <p>The selection of treatment operators is to the collectors' discretion. Foreign regeneration operators supplied by French collectors are financed by the French PRO, but transportation costs are handled by the collector.</p> <p>Smaller collectors consistently work with national regeneration operators.</p>
Processed into fuel	N/A
Cement/lime kilns	N/A
Power plants	Not used
HWI	N/A
Other	N/A
Illegal collection and treatment	
Fate of non-collected collectible oil	White oils are frequently mixed with black oils, and therefore not collected as such.

Final Report

Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	No available data found.
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	<p>Control efforts by local authorities (before the EPR) have not revealed that illegal disposals happen on a regular basis, or with large quantities of waste oils.</p> <p>Clandestine waste oil deposits near workshops do take place but waste oil is most probably mixed with black oils often without contamination.</p> <p>Mixing events are also frequent in municipal waste facilities, either because of unclear/misunderstood indications on-site (mixing with food oils), or because of clandestine deposits of oils not accepted in the scheme (e.g. PCB contaminated oil).</p> <p>An ADEME study will focus on the problems linked to illegal waste disposal (including waste oils) in 2023.</p>
Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)	According to the PRO, illegal combustion of waste oils is more frequent than illegal disposal occurrences, especially because of fluctuating market prices of oil. No quantitative data is available.
Legal status	Burning waste oil in small burners is forbidden (incineration of hazardous waste requires a permit that small burners do not have).
Quantities / proportion treated that way	N/A : Little information is available to the EPR on illegal practices, as for now its control procedures only imply two mobile agents covering the entire territory.
Number of incidents reported	N/A: data collection on illegal practices by the EPR is only qualitative as of today
Actors	
Competent public authorities	ADEME/DGPR
Producer Responsibility Organisation	CYCLEVIA
Key re-refiners	OSILUB (JV VEOLIA/TOTAL) and ECO-HUILE
Key collectors	<p>51 collectors (including 8 overseas, and 2 based in Belgium)</p> <p>The largest collectors are CHIMIREC and SARPINDUSTRIES (Veolia), covering over 75% of the market.</p> <p>ECO-HUILE, the biggest re-refiner, accounts for 15% of collection as well.</p> <p>Regrouping-collectors now account for a vast majority of collection taking place on the territory. Simple “collectors” (ie. smaller collectors without</p>

	storage facilities) <u>did not exist before 2022 and it is difficult to predict their number</u>
Key producers	<p>Companies of UFIP (Union Française des Industries Pétrolières) → 50.3 % Companies of CSNIL (Chambre Syndicale Nationale de l'Industrie des Lubrifiants) → 37.9% Other, smaller companies → 11.8%</p> <p>~67% of oils placed on the market are bound to the automobile market</p>
Bibliography	
Literature/documents/annual reports	<p>ADEME (2020) Note: Préparation des travaux de réflexion dans le cadre de la mise en place d'une filière REP appliquée aux huiles</p> <p> 3378- ADEME - Note Préfiguration f</p> <ul style="list-style-type: none"> • • <p>ADEME (2022) Tableau de bord de la filière huiles usagées du mois de décembre 2021</p> <p> Tableau de bord HU - dec 2021.pdf</p> <ul style="list-style-type: none"> • <p>Centre Professionnel des Lubrifiants (C.P.L. ; 2021) Parution de la brochure Statistiques Lubrifiants 2020 (http://cpl-lubrifiants.com/)</p>
Contacted stakeholders	<p>ADEME/DGPR (Public authorities) CYCLEVIA (PRO) VEOLIA (Regrouping-collector) CHIMIREC (Regrouping-collector)</p>

Conclusion

The EPR system implemented in France for waste oil collection in the context of the 2020 law relative to circular economy and the reduction of waste intended to solve two issues:

- Restore the obligation for collectors to offer free collection of waste oils to waste holders. This obligation had to be lifted in 2016 due to the decrease of oil prices meaning that gate fees could no longer fully support collection cost;
- Replace the public subsidy for collection, transport and treatment of waste oil from oversea territories by an EPR instrument.

As waste oil collection schemes had been active for several years in France, the EPR was built upon practices that allow for fairly high collection and capture rates as compared to European values, and deemed satisfactory by collection and PRO actors. Leverage to significantly increase collection rates are not clearly identified as illegal practices are viewed as relatively marginal. Improvement of white oils collection is viewed as a potential source of progress. Actors did not express major issues related

to waste oil quality (such as mixing of substances or contamination of batches). Regeneration targets are relatively ambitious compared to current rates.

The EPR has only recently come into force (beginning 2022). Because some operational aspects are not decided yet, according to collection operators, the implementation of the EPR is still associated with uncertainties and concerns about the actors' roles and status, linked for instance to the replacement of previous departmental agreements by registration to the PRO, and to the modification of geographical coverages of collectors.

Interviewed collection operators also expressed concerns about hypothetical scenarios of an over-controlling EPR scheme, for example in the instance of the PRO becoming the owner of collected flows, or traceability procedures growing unreasonable and excessive.

One of the two regeneration operators (ECO-HUILE) has also filed a legal action against the ministerial order authorizing Cyclevia to operate as a PRO. This legal action is motivated by the new conditions applicable to collectors under the EPR scheme in the model contract they must sign with the PRO, viewed as more restrictive compared with the previous situation:

- Geographical area over which the co-collectors are allowed to collect – only departments close to or bordering the collector's storage facility;
- The impossibility for collectors to collect with only a registration and reporting obligation, even if this means they are not financially supported by the PRO. To be authorized for collection, they must also contract with the PRO in view of receiving the support scale, which entails additional conditions.
- The obligation to collect at 0 price whereas it was possible to pay the waste holders before (collectors can no longer compete for access to the waste stream using the gate fee as an incentive);
- The obligation to provide economic data to the PRO in view of the elaboration of the support scale

As the EPR scheme has only been active since early 2022, these perspectives suggest that the upcoming months will be decisive in developing an efficient and sustainable collection scheme, profitable to all actors involved. Transparency from all parties, preservation of an adequate situation of competition between market players, and efficient monitoring of processes (leading to sensible and periodic adaptations of the EPR scheme) will be key in that regard

8.2.6. Germany

Country	Germany	
General data		
Population	83,129,285 ¹⁹⁴	
Population density (per km ²)	232 ²¹⁹⁵	
GDP per capita (€/capita)	42,523 ¹⁹⁶	
EPR system (yes/no)	No	
Start date of the EPR	N/A	
Voluntary/mandatory	N/A	
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	N/A	Engine and gear box oil
	N/A	Industrial oil
	N/A	Metal working oils and other oils leading to emulsions
	N/A	2-stroke engine oil (lost oils)
	N/A	Lubricants sold inside vehicles
	N/A	Marine engine lubricating oil
	N/A	Greases
Scope – exempted producers	N/A	
PRO(s) name(s)	N/A	
Existence of a central register of producer	N/A	
Entity/ies in charge of feeding it	N/A	
Entity/ies in charge of controlling the register	N/A	PRO
	N/A	Environmental agency
	N/A	Environmental ministry
	N/A	Tax agency
Legislation		
EPR / collection schemes	<p>The legislation on the waste oil ordinance provides a basis for the waste oil collection scheme in Germany. It dissociates between private and industrial uses/ or obligation of collecting schemes between private and industrial entities.</p> <p>Private use: Retailers of oils are obliged to establish collection points for waste oils prior to commercial delivery of combustion engine oils or gear oils; Collection points must collect used combustion engine or gear</p>	

¹⁹⁴ [Bevölkerung nach Geschlecht und Staatsangehörigkeit](#)". Destatis.

¹⁹⁵ [Bevölkerung nach Geschlecht und Staatsangehörigkeit](#)". Destatis.

¹⁹⁶ "[World Economic Outlook database: April 2021](#)". [International Monetary Fund](#). April 2021. [Archived](#) from the original on 12 April 2021. Retrieved 12 April 2021. (currency changed using [USD to EUR Exchange Rate - Bloomberg Markets](#) on 11/07/2022)

	<p>oils free of charge¹⁹⁷ (Waste Oil Ordinance §8 AltöIV)</p> <p>Industrial use of oil: the collection and treatment are market based, there are 7 large refineries (see below) who perform treatment and partly collect the waste oil themselves; there are also companies who only do the treatment OR the collection.</p> <p>Individual case as opposed to industry; the individuals can leave their waste oil free of charge at a collection point (that was established by the retailer) as long as the amount does not exceed what the individual has bought previously at that collection point. Any retailer that sells oil also must provide a collection point. There are also some collection points established by the municipalities, some of which are free of charge, and some require to pay a small fee.</p>
Quality standards	Waste Oil Ordinance ¹⁹⁸
Collection	The system is market-based with both collecting organisations and treatment operators acting independently and based on price signals, accompanied by legal requirements (Waste Oil Ordinance §1) ¹⁹⁹
Mixing: bans and conditions	Yes, in Germany it is prohibited to mix waste oil with other waste and waste oils with oils of other categories (Waste Oil Ordinance § 4) ²⁰⁰
Treatment	<p>In Germany according to Annex 1 to § 2 (2) and § 4 (3 and 6)²⁰¹ of the waste oil ordinance the treatment of waste oil is performed according to categories of waste oil. Germany identifies 4 categories of waste oil which are the following:</p> <ul style="list-style-type: none"> • Category 1: mineral oil-based non-chlorinated hydraulic, engine, gear, insulating, heat transmission and lubrication oils. • Category 2: halogen-free processing oils (except emulsions), synthetic processing and hydraulic oils.

¹⁹⁷ Presentation for Waste Oil Workshop (19/5/2022) prepared by Georg Surkau

¹⁹⁸ Waste Oil Ordinance (Altölverordnung AltöIV) [AltöIV - Altölverordnung \(gesetze-im-internet.de\)](#)

¹⁹⁹ Waste Oil Ordinance (Altölverordnung AltöIV) [AltöIV - Altölverordnung \(gesetze-im-internet.de\)](#)

²⁰⁰ Waste Oil Ordinance §4 (Altölverordnung §4 AltöIV) [§ 4 AltöIV - Einzelnorm \(gesetze-im-internet.de\)](#)

²⁰¹ Waste Oil Ordinance Annex 1 (Altölverordnung Anlage 1 AltöIV) [Anlage 1 AltöIV - Einzelnorm \(gesetze-im-internet.de\)](#)

Final Report

	<ul style="list-style-type: none"> • Category 3: chlorinated processing, hydraulic, engine gear and lubricating oils, PCB-containing oils. • Category 4: readily biodegradable hydraulic, engine, gear and lubricating oils). <p>Waste Oils in category 1 are suitable for regeneration; waste oils of other categories should be regenerated, provided that no pollutants are accumulated in the resulting base oils</p>
Export	Import of Additional Waste Oil (201,542 t), 10,000 t exported ²⁰² (in 2020)
End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	None
Waste oils mass flow	
Quantities placed on the market (t)	814,213 t
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	Total sales volume: 349,297 t is collected as waste oil (42.8 %)
Collected quantities (t)	349,297 t + 201,542 t imported
Regeneration %	88% ²⁰³ (in 2014)
Processed into fuel %	<1% (4,596 t) ²⁰⁴
Cement/lime kilns %	8.5 % ²⁰⁵
Power plants %	12.9% ²⁰⁶
HWI %	N/A
Other %	7.6% ²⁰⁷
Collection	
Type of collected waste oils inside the collection / EPR scheme	Y Engine and gear box oil
	Y Industrial oil
	N Emulsions
	N Marine lubricating oil (separately) ²⁰⁸
	N Marine slop oils (mixed with fuels)
Type of waste holders in the collection /EPR scheme	Y Recycling centres / municipalities
	Y Garages
	Y Harbours
	Y Inland harbours

²⁰² Altölkreislauf 2020, BVA (Bundesverband Altöl)

²⁰³ BVSE: <https://www.bvse.de/fachbereiche-sonderabfall-altoel/altoel-themen/altoelaufkommen-in-deutschland.html>

²⁰⁴ Jepsen, Zimmermann (2016) „Erhebung der Struktur des Altölsammelmarktes und Optimierungspotenziale für bessere Altöl-qualitäten im Kontext der Abfallhierarchie Endbericht“ Dresden Ökopool GmbH.

²⁰⁵ Ibid.

²⁰⁶ Ibid.

²⁰⁷ Ibid.

²⁰⁸ Only oils from inland shipping, but very little.

Final Report

	<table border="1"> <tr> <td>Y</td> <td>Small companies (e.g., farms, SMEs...)</td> </tr> <tr> <td>Y</td> <td>Industries</td> </tr> </table>	Y	Small companies (e.g., farms, SMEs...)	Y	Industries
Y	Small companies (e.g., farms, SMEs...)				
Y	Industries				
Existence of intermediate storage / pre-treatment facilities	Yes, mainly by the collecting companies and major refineries. However, some smaller companies have storage capacities too. Pre-treatment consists in mixing the waste oil with the relevant chemicals to increase quality in the refineries				
Collection conditions depending on stakeholders	<p>Retailers of oils are obligated according to §4 of the waste oil ordinance²⁰⁹ to offer a collection point for the waste oil (and to accept amounts up to what was previously purchased by the individual, free of charge); Private households may also dispose of waste oils at the municipal hazardous waste collection point (depending on the municipality);</p> <p>Companies and industries will sell their waste oil to a refinery who either collects the waste oil themselves or have a third-party contractual agreement allowing to collect it for them.</p> <p>Collection is organized partly by companies that are specialized in the collection, larger refineries, however, tend to have collection processed in place in house.</p>				
Free collection for waste holders	The collection is free depending on the quantity collected for both households and companies (this is expected to change for industry if the collection and treatment of the waste oil are no longer profitable due to changes in the oil price).				
Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)	The quality conditions follow the 4 categories for collection (see above).				
Involvement of treatment operators in collection activities / schemes	The major refineries are involved in the collection of the waste oil (Baufeld, Avista Oil, Puraglobe, Starke & Sohn GmbH, Südöl, KS Recycling GmbH & Co., Electrical Oil Services GmbH).				
Geographical coverage	The geographical coverage is comprehensive, as every retailer is obligated to have the capacity to collect the corresponding waste oil.				

²⁰⁹ Waste Oil Ordinance §4 (Altölverordnung §4 AltöIV) [§ 4 AltöIV - Einzelnorm \(gesetze-im-internet.de\)](https://www.gesetze-im-internet.de/alt_oel_2002_s4.html)

Final Report

Quality		
Separate collection of waste oils of different quality / composition	According to §4 of the Waste Oil Ordinance ²¹⁰ , mixtures of waste oils of different quality may not be dropped off at collection point, neither may they be stored together.	
Key actions of the EPR / collection scheme to improve waste oil quality for regeneration	A key action to improve waste oil quality is the mixing ban (§4 of waste oil ordinance) that is focused on the waste oil management by waste holders and collectors	
End-treatment depending on quality	Waste oils are treated according to categories of waste oil specified in annex 1 of the waste oil ordinance ²¹¹ (see above). While waste oils in category 1 are suitable for regeneration; waste oils of other categories should be regenerated, provided that no pollutants are accumulated in the resulting base oils (Waste Oil ordinance §2 (2))	
Financing		
Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees	N/A	
Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions	Waste oil collection and treatment in Germany is market based. Collectors are paid by treatment operators, based on quality and quantity of the waste oils.	
Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions	A representative from the Ministry of the Environment explained that there is generally no fee for private households, however some municipalities take a small fee from individual oil producers depending on the quantity.	
Instruments to finance collection in isolated / remote areas	-	Differentiated fee scale
	-	Financing transport cost
Instruments to adapt financing to oil prices	N/A	
Reporting: procedure for reporting, verifications / audits	No reporting (neither to PRO nor public authority)	
Collectable quantities	Waste oil mass flows are calculated based on statistical data and assumptions (e.g.	
Collected quantities		

²¹⁰ Waste Oil Ordinance §4 (Altölverordnung §4 AltöIV) [§ 4 AltöIV - Einzelnorm \(gesetze-im-internet.de\)](https://www.gesetze-im-internet.de/alt_oelvo_2002_s4.html)

²¹¹ Waste Oil Ordinance Annex 1(Altölverordnung Anlage 1 AltöIV) [Anlage 1 AltöIV - Einzelnorm \(gesetze-im-internet.de\)](https://www.gesetze-im-internet.de/alt_oelvo_2002_anlage_1.html)

Final Report

	import / export data, sold amounts of lubricants, assumed return rates, water content, therefore some uncertainty range has to be accepted).
Non-collected collectible waste oils	N/A
Waste oils quality assessment	N/A
Quantities per type of treatment and destination	N/A
Treatment	Generally national
Geographical destination specify regional / national / Eu-wide	Collection and treatment are largely performed within national borders. However, approximately 10,000 tonnes are exported, generally due to closer proximity of facilities in border regions. The distance the collected waste oil has to travel within Germany also depends on the availability of facilities. However, the collection is determined by the cost, so usually the waste oil will be brought to the refinery in closest proximity, hence mainly regional treatment (unless of course, the waste oil requires a specific treatment that is not available in that region).
Regeneration	N/A
Processed into fuel	N/A
Cement/lime kilns	N/A
Power plants	N/A
HWI	N/A
Other	N/A
Illegal collection and treatment	Limited (inexistent) given lack of auditing system ²¹²
Fate of non-collected collectible oil	N/A
Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	N/A
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	N/A
Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)	N/A
Legal status	§ 10 (1) of the waste oil ordinance specifies that it is a regulatory offence (with respect to § 69 (1) No. 8 of the Closed Substance

²¹² The industry stakeholders mentioned potential explanations as to how the illegal disposal might happen, however, due to the market based system in Germany that does not entail any sort of reporting system (only the backward calculation model), there is no data on the specific numbers or amounts that are discarded illegally, neither is there knowledge of the ways in which it is disposed, which gives rise to the assumption that it is mixed in with other substances to cover the waste oil.

Final Report

	Cycle and Waste Management Act) to intentionally or negligently fail to set up a collection point or fail to do so in good time and to provide proof of such, or fails to do so correctly or in good time, or fails to provide information in the prescribed manner
Quantities / proportion treated that way	N/A
Number of incidents reported	N/A
Actors	
Competent public authorities	<ul style="list-style-type: none"> • BMUV (Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection) • UBA (German Environment Agency)
Producer Responsibility Organisation	None
Key re-refiners	Baufeld, Avista Oil, Puraglobe, Starke & Sohn GmbH, Südöl, KS Recycling GmbH & Co., Electrical Oil Services GmbH
Key collectors	Baufeld, Avista Oil, Puraglobe, Starke & Sohn GmbH, Südöl, KS Recycling GmbH & Co., Electrical Oil Services GmbH
Key producers	Baufeld, Avista Oil, Puraglobe, Starke & Sohn GmbH, Südöl, KS Recycling GmbH & Co., Electrical Oil Services GmbH
Bibliography	
Literature/documents/annual reports	Waste Oil Ordinance ²¹³ , BVSE ²¹⁴ , UBA ²¹⁵²¹⁶ , BMUV ²¹⁷ , BVA ²¹⁸ (Bundesverband Altöl)
Contacted stakeholders	Umweltbundesamt (UBA) Baufeld Bundesverband Altöl Avista

Germany provides a good example of Member State with a well-functioning waste oil management system without an EPR scheme. Instead of an EPR, Germany operates a collection and recycling scheme with a regeneration rate of 88% of oil waste. The scheme is put in place based on the Waste Oil Ordinance²¹⁹ (Altölverordnung) which defines key modalities of collection and the treatment of the oil waste.

The scheme is predominantly market based, with the exception of a few municipal collection points where collection is provided free of charge. As the scheme is market based

²¹³ Waste Oil Ordinance (Altölverordnung AltöIV) [AltöIV - Altölverordnung \(gesetze-im-internet.de\)](https://www.gesetze-im-internet.de/alt_oelverordnung/)

²¹⁴ [bvse - Bundesverband Sekundärrohstoffe und Entsorgung | Recycling und Kreislaufwirtschaft](https://www.bvse.de/)

²¹⁵ [Das UBA | Umweltbundesamt](https://www.uba.de/)

²¹⁶ Sander, K., Jepsen, D., Zangl, S., & Schilling, S. (2006). Material flow analysis and market survey for securing the disposal of waste oils; Stoffstrom- und Marktanalyse zur Sicherung der

Altöelentsorgung. <https://www.umweltbundesamt.de/publikationen/stoffstrom-marktanalyse-zur-sicherung>

²¹⁷ [Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz | BMUV](https://www.bmu.de/)

²¹⁸ [Home - Bundesverband Altöl e.V. \(bva-altolrecycling.de\)](https://www.bva-altol.de/)

²¹⁹ Waste Oil Ordinance (Altölverordnung AltöIV) [AltöIV - Altölverordnung \(gesetze-im-internet.de\)](https://www.gesetze-im-internet.de/alt_oelverordnung/)

as opposed to being based on a central EPR scheme organized at the state level, there is no central register holding the data on the quantities of waste oil, its quality and its specific treatment. Hence, Germany does not have available data on the exact amounts of collected waste oil and its treatment. For example, in 2020 the amount of oil waste with unknown track record was 62,000 tonnes, which represented roughly 11 % of the total waste oil potential, including imports. While this amount does not necessarily imply an illegal treatment of this waste oil, its fate remains unknown, as there is no central register. Given that under the framework of the current system it is impossible to retrace the end of the life of waste oil, there seems to be potential for improvement in this area of the scheme. The interviewed stakeholders noted that a system requiring a more rigid reporting structure could address this issue (backwards calculation model²²⁰). The amount of waste oil that is not accounted for is most likely drained and mixed with other substances and then sold as a new product²²¹. As it is unknown which products contain the waste oil that is not registered and treated as such, the exact composition and the quality of the products containing illegal waste oil is also impossible to know exactly.

The interviewed stakeholders agreed that it would be beneficial to introduce a more formal and enforced reporting system (with control and enforceability measures). However, the achievement of this goal does not necessarily require the implementation of an EPR scheme. The stakeholders expressed their concern that the introduction of an EPR scheme in Germany, accompanied by a more robust reporting scheme, could hamper market competition and slow down innovation by adding administrative burden and reporting costs to the currently very lean system. Moreover, recently German industry stakeholders informed the European Commission about the new initiatives, the details of which will be further defined. The new initiative aims at the introduction of the self-commitment system by GVÖ Gebinde-Verwertungsgesellschaft der Mineralölwirtschaft mbH (GVÖ) and manufacturers involved in the market (the waste oil collectors and the operators of the recovery plants or their respective associations), that would increase the regeneration and collection rate of recyclable waste oils. Among other, the information notice states that “to ensure and monitor the achievement of the annual regeneration and collection quotas yet to be defined, it is planned to set up a registration and certification system for waste oil collectors at GVÖ”.

²²⁰ <https://www.umweltbundesamt.de/publikationen/stoffstrom-marktanalyse-zur-sicherung>

²²¹ Industry stakeholders formulated this assumption of the usage of the unreported waste oil.

8.2.7. Hungary

The Hungarian waste oil collection and treatment scheme represents an Eastern European approach to waste oil management (no re-refineries present, focus on re-utilization and waste motor oil (WMO)). In that way the Hungarian system is quite different from other approaches existing in Western European Member States, which are characterised by regeneration of oil waste to base oil. Similarly to other Member States such as Estonia, Hungary does not have any re-refineries, which means that the waste oil cannot be regenerated in the country. However, rather than exporting the waste oil to countries with re-refineries, Hungary's waste oil scheme focuses on re-utilization of the waste oil (in other products such as flux oil or low grade lubricants) and WMO (waste motor oil to diesel).

Country	Hungary	
General data		
Population	9,700,000 ¹⁶	
Population density (per km ²)	107	
GDP per capita (€/capita)	18,004 ¹⁷	
EPR system (yes/no)	No	
Start date of the EPR	N/A	
Voluntary/mandatory	N/A	
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	N/A	Engine and gear box oil
	N/A	Industrial oil
	N/A	Metal working oils and other oils leading to emulsions
	N/A	2-stroke engine oil (lost oils)
	N/A	Lubricants sold inside vehicles
	N/A	Marine engine lubricating oil
	N/A	Greases
Scope – exempted producers	N/A	
PRO(s) name(s)	N/A	
Existence of a central register of producer	N/A	
entity/ies in charge of feeding it	N/A	
entity/ies in charge of controlling the register	N/A	PRO
	N/A	Environmental agency
	N/A	Environmental ministry
	N/A	Tax agency
Legislation		
EPR / collection schemes	The collection scheme is based on the environmental protection product charge. ²²²	

²²² 2011. LXXXV. Law on the environmental protection product fee <https://net.jogtar.hu/jogszabaly?docid=a1100085.tv>

Final Report

Quality standards	Quality standards for waste oil are not set by legislation. Collectors can specify quality acceptance criteria for themselves. ²²³
Collection	Liability for product charges shall be borne by the first buyer of the first domestic supplier or the first user for own purposes (Product Charge Sec. 3(3)) ²²⁴
Mixing: bans and conditions	In line with the EU Waste Framework Directive, the Hungarian Waste Law does not allow mixing of waste oils with other kinds of waste or substances and with waste oils of different characteristics, without having a waste management permit.
Treatment	The waste hierarchy established by the EU is to be respected first and foremost. Unless the waste oil is recycled and reused, there is no refund (product charge ²²⁵). Governmental permit needed for waste oil collection and processing. Permit also states the maximum processable waste oils quantity per year (in kilotonnes). ²²⁶ Waste oils of different qualities are treated differently: oil of good quality is used in new products whereas waste oil of lower quality is used differently (this quality assessment is entirely up to the buyers).
Export	As waste oil is a hazardous waste, permits from the local authorities and the payment of administration fee is needed to export the oil.
End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	Waste status can only be removed by utilization, i.e., once the waste oil is used in a different way (than re-refining or incineration) for instance in other products, it is no longer considered waste. ²²⁷
Waste oils mass flow	
Quantities placed on the market (t)	65,000-75,000 t (estimated) ²²⁸
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	There is no valid, independent estimation for the quantity lubricants lost in use. As a rule of thumb, the industry stakeholders suggest an estimation: as 50% of the finished lubricant on the market is used in material or lost in use, and another 50% is generating waste, thus appears as collectible waste oil. Consequently, it is assumed that the Hungarian waste oil potential is 30,000-35,000 tonnes.
Collected quantities (t)	About 20,000 tonnes of waste oil is collected and reprocessed in Hungary per year. ²²⁹
Regeneration %	None
Processed into fuel %	N/A

²²³ 72/2013. (VIII. 27.) decree on the list of waste <https://net.jogtar.hu/jogszabaly?docid=a1300072.vm>

²²⁴ 145/2012. (XII. 27.) decree on the detailed rules of waste management activities related to waste oil <https://net.jogtar.hu/jogszabaly?docid=a1200145.vm>

²²⁵ 2011. LXXXV. Law on the environmental protection product fee <https://net.jogtar.hu/jogszabaly?docid=a1100085.tv>

²²⁶ 43/2016. (VI. 28.) Decree on the listing of disposal and utilization operations related to waste management (N.B. recovery and treatment codes; e.g. R9) <https://net.jogtar.hu/jogszabaly?docid=a1600043.fm>

²²⁷ 145/2012. (XII. 27.) decree on the detailed rules of waste management activities related to waste oil <https://net.jogtar.hu/jogszabaly?docid=a1200145.vm>

²²⁸ Information provided by industry stakeholder.

²²⁹ Information provided by industry stakeholder.

Final Report

Cement/lime kilns %	N/A
Power plants %	N/A
HWI %	N/A
Other %	Industry stakeholders estimate that from the 30,000-35,000 tonnes of Hungarian waste oil market 10,000-15,000 tonnes is disposed or used illegally (burning, other domestic uses); 15,000-20,000 tonnes is recycled and used for flux oil production, which is later used as bitumen blending feedstock; 2,000-3,000 tonnes is used for low-grade lubricant production ²³⁰²³¹
Collection	
Type of collected waste oils inside the collection / EPR scheme	Y Engine and gear box oil
	Y Industrial oil
	Y Emulsions
	N Marine lubricating oil (separately)
	N Marine slop oils (mixed with fuels)
Type of waste holders in the collection /EPR scheme	N Recycling centres / municipalities
	N Garages
	N Harbours
	N Inland harbours
	N Small companies (e.g. farms, SMEs...)
	Y Industries
Existence of intermediate storage / pre-treatment facilities	The collectors have both intermediate storage and pre-treatment facilities. Some industry stakeholders use intermediate storages for the waste oil collected by partners. All Hungarian companies have a pre-treatment license for used oil. ²³²
Collection conditions depending on stakeholders	Collection conditions are the same for all stakeholders. For collection, an activity permit and transport vehicle are needed, for treatment and utilization, a permit for the activity, the site and processing technology are needed. ²³³
Free collection for waste holders	The waste oil is sold to the collectors who can re-sell it to producers, however, there is a product tax on the waste oil selling price. The collection for industry is thus not free, the price is market-based. ²³⁴ Free collection for private individuals: it is possible to bring waste oils to waste yards and industry storage facility.

²³⁰ Ibid.

²³¹ <http://www.gegolflux.com/gegol-site-eng.html>

²³² Information provided by industry stakeholder.

²³³ Ibid.

²³⁴ Ibid.

Final Report

<p>Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)</p>	<p>The refund of product tax provided²³⁵ for in Subsection (2) of Section 25 of the Environmental Product Protection Fee²³⁶ may be claimed for the quantity of used or waste lubricate oil transferred for recovery in the quarter concerned, or, if the subject is also a recycler for the quantity of used or waste oil received for recovery. If the subject itself carries out the recycling process relating to used or waste lubricating oils used for own purposes from lubricant oils subject to product charges, the refund shall be based on the recycled quantity of used or waste oils.</p> <p>The sum of the total amount of products tax refunded quarterly should not exceed the total amount of products tax paid for the Given year by the subject.</p> <p>Industry stakeholders make individual contracts for the collection of waste oils with partners. Price and quality parameters are set there, differing from customer to customer.²³⁷</p>
<p>Involvement of treatment operators in collection activities / schemes</p>	<p>Some treatment operators contract collectors but most collectors collect the waste oil independently and then resell. Some treatment operator companies also operate waste oil collection network, others only contract the collection companies and purchase oil from them.</p>
<p>Geographical coverage</p>	<p>There are no regional differences.</p>
<p>Quality</p>	
<p>Separate collection of waste oils of different quality / composition</p>	<p>Separation is only based on waste classification codes. These distinguish chlorine containing and non-chlorine containing lubricants, synthetics and biodegradable. No other split is available in any of the categories, so lubricants contain both industrial and automotive products.</p> <p>Separation based on quality rarely happens. Many companies add other liquid waste to the used oil. (e.g. antifreeze, fuel, etc.). Most waste holders use the general waste code (13 02 05*), which is allowed by law.</p>
<p>Key actions of the EPR / collection scheme to improve waste oil quality for regeneration</p>	<p>There are no such incentives. According to industry representatives, the European Waste Catalogue (EWC) codes are too diverse and not user friendly.²³⁸ Hence it does not help to perform a separate collection. It is claimed that these should be simplified/narrowed down. Some indication on labels about separate collection instructions could be useful.</p>

²³⁵ This is the refund of the product tax. It is a sort of Green Tax on certain products that negatively impact the environment. The Product Fee rates vary per kilogram placed on the Hungarian market, and are self-assessed. Data reporting and payment of the product fee must be submitted quarterly to the tax authority, the National Tax and Customs Authority, which also carries out product fee inspections

²³⁶ 2011. LXXXV. Law on the environmental protection product fee
<https://net.jogtar.hu/jogszabaly?docid=a1100085.tv>

²³⁷ Information provided by industry stakeholder.

²³⁸ Information provided by industry stakeholder.

Final Report

End-treatment depending on quality	Currently, perhaps due to the low quantities of waste oils collected, there is no differentiation based on quality. Collected waste oils mostly are directed to recycling, and they can meet the quality specifications most of the times. Only exceptions are in case of high water content.	
Financing		
Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees	Product fee ²³⁹ has to be paid for each kg of lubricants placed on the Hungarian market. This value is 0.308 EUR/kg ²⁴⁰ and is paid to the Hungarian tax authorities. This amount is paid by the lubricant producers, but it is totally transferred to the customer. In the end, the customer pays this product fee, and the producer provides him with a declaration that states the payment of this product fee has been made for the tax authority. This product fee may be reclaimed by producer companies in case the producer organises the collection and transfer of the waste oil to a recycler company. Recycler (which can also be a producer) company does not need to re-refine the product to concrete, base oil-like state, but has to use the material without burning (has to be used in material, e.g. as a feedstock for a product – low grade lubricant or bitumen). Hence, the lubricant marketer is motivated to collect waste oil for recycling.	
Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions	N/A	
Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions	A refund may be requested for the quantity of used or Waste Lubricating oils delivered during the quarter by the producers, for the purpose of recycling, or - if the obligor is a recycling operator - for the quantity of used or waste lubricating oils received for the purpose of recycling. If the producers, itself carries out the recycling process relating to used or waste lubricating oils used for own purposes from lubricating oils subject to product charges, the refund shall be based on the recycled quantity of used or waste lubricating oils. The total amount of products charges refunded quarterly may not exceed on the aggregate the total amount of products charges paid for the given year. (Product Charge Chapter 6 Sec. 25/A(5)) ²⁴¹	
Instruments to finance collection in isolated / remote areas	N	Differentiated fee scale
	N	Financing transport cost

²³⁹ 2011. LXXXV. Law on the environmental protection product fee
<https://net.jogtar.hu/jogszabaly?docid=a1100085.tv>

²⁴⁰ 114 HUF/kg (1HUF=0,002705EUR) average EBC conversion rate
https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/eurofxref-graph-huf.en.html

²⁴¹ 2011. LXXXV. Law on the environmental protection product fee
<https://net.jogtar.hu/jogszabaly?docid=a1100085.tv>

Final Report

Instruments to adapt financing to oil prices	Not applicable for Hungary, as the waste oil product fee is not dependent on the oil price.
Reporting: procedure for reporting, verifications / audits	There is no reporting or auditing system in Hungary.
Collectable quantities	Waste declarations (waste owner, transporter, collector, recycler, etc.), transport document (SZ sheet), records, data retention, declaration of environmental protection product fee, waste oil processing, product fee refund documents (e.g. utilization certificate). Aggregated data on the amount of generated and treated, broken down by has to reported on the National Environmental Protection Information System ²⁴²
Collected quantities	Collectable quantities are not reported, as it cannot be defined precisely. Bigger companies report lubricant sales data for the Hungarian Petroleum Association (Magyar Ásványolaj Szövetség) ²⁴³ , but it covers only ~2/3 of the market and deals only with sold lubricants, not collectable waste. Collected amounts are indirectly reported to tax authorities, as marketers are reclaiming the product fee based on collected volumes. Qualities or exact treatment types are not reported.
Non-collected collectible waste oils	N/A
Waste oils quality assessment	N/A
Quantities per type of treatment and destination	N/A
Treatment	
Geographical destination specify regional / national / Eu-wide	Treatment is performed nationally. It mostly consists of flux oil production, which is used for bitumen blending feedstock.
Regeneration	There is no regeneration in Hungary.
Processed into fuel	Domestic recyclers only produce flux oil or low-grade lubricants, which is done all over Hungary.
Cement/lime kilns	N/A
Power plants	N/A
HWI	N/A
Other	N/A

²⁴² Országos Környezetvédelmi Információs Rendszer (OKIR) (*National Environmental Protection Information System*) (*N.B. Data can be found at Hulladékgazdálkodási adatok/ Összesített hulladékképződési adatok/ Adatok régiók szerint hulladéktípusonként; data is available until 2020*) – <http://web.okir.hu/sse/?group=EHIR>

²⁴³ Hungarian Petroleum Association, Publication: <https://www.yumpu.com/en/document/view/30276672/oil-in-hungary-magyar-asvanyolaj-szovetseg>

Final Report

Illegal collection and treatment	
Fate of non-collected collectible oil	It is likely disposed illegally (e.g. into communal waste) or burned in consumer furnaces.
Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	N/A
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	There are some (1-2) major incidents reported every 5 years with media coverage, but it is only visible if it leaks into the water. ²⁴⁴
Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)	Possibly, as about 1/3 of the collectible waste oil is not collected.
Legal status	It is illegal, but practically impossible to prove in the current system if somebody burns the waste oil in a small burner.
Quantities / proportion treated that way	Hard to make an estimation, as the missing 1/3 of collectible oil (~10,000-15,000 tonnes) is either burned illegally or disposed illegally. The industry stakeholder estimates that ~5,000-8,000 tonnes is burned illegally (1/6-1/4 of the collectible waste oils)
Number of incidents reported	N/A
Actors	
Competent public authorities	Ministry of Environment ²⁴⁵ , Department of Environmental Protection ²⁴⁶ , Nature Conservation and Waste Management ²⁴⁷ , Ministry for Technology and Industry ²⁴⁸
Producer Responsibility Organisation	None
Key re-refiners	None
Key collectors	Design Kft., Evolube, Huber Alba Kft., Rigodon 2003 Kft., Ózon Kft., Multigrade Kft., Majoros Kft., Terra Városkút, Ecomissio, Büchl, Loacker, Agrego Halas, and other smaller companies. ²⁴⁹
Key producers	MOL, Kal-Oil, Gégol, Rigodon 2003 Kft., Evolube, Vértesi Környezetgazdálkodási Kft.
Bibliography	
Literature/documents/annual reports	Product Charge act [1820], Law on the environmental protection product fee, decree on the list of waste (72/2013. (VIII. 27.)), decree on the detailed rules of waste management activities related to waste oil (145/2012. (XII. 27.))

²⁴⁴ https://index.hu/belfold/2020/01/28/hatalmas_olajfolt_uszik_a_dunan_budapestnel/
https://index.hu/belfold/2018/08/06/mol_hordo_duna/

²⁴⁵ Országos Környezetvédelmi, Természetvédelmi és Hulladékgazdálkodási Főosztály (Megyei Kormányhivatalok), Technológiai és Ipari Minisztérium (*Department of Environmental Protection, Nature Conservation and Waste Management, Ministry for Technology and Industry*)

²⁴⁶ <http://www.ktm.hu>

²⁴⁷ Information provided by industry stakeholder.

²⁴⁸ Ibid.

²⁴⁹ Ibid.

Final Report

Contacted stakeholders	Stakeholders from the Ministry of Environment; Industry stakeholders (Interview conducted 13.7.2022 and 22.7.2022)
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Several industry stakeholders were interviewed during research. Among others, stakeholder pointed out existing challenges of the Hungarian system with regard to the waste oil collection and treatment. Those include a lack of incentives for small users to get their waste oils collected or take back their waste oils. In terms of technical challenges, stakeholders mentioned a lack of rapid quality tests allowing the quick examination of waste oil quality at the moment of takeover from the waste holders. This has resulted in a lack of incentives for waste holders (especially those who have large quantities) from degrading quality (e.g. with water) for the sake of selling a higher quantity. To disincentivize this practice, repayment of product fees could be linked to quality. The industry stakeholders feel that waste codes are currently too complex and do not allow for proper collection, as the capacities of the waste collectors is not laid out for this fine-grained distinction of waste oils. Simplification and education are needed for domestic users to be able to collect and report waste properly.

8.2.8. Poland

Country	Poland														
General data															
Population	38,179,800 ²⁵⁰														
Population density (per km ²)	122 ²⁵¹														
GDP per capita (€/capita)	37,5 ²⁵²														
EPR system (yes/no)															
Start date of the EPR	An EPR-like system started in Poland in 2001 ²⁵³														
Voluntary/mandatory	Mandatory – for producers introducing a given product category to the market. The Waste Law of 14 December 2012 in art. 13 (16) defines waste oils as any mineral or synthetic lubricating or industrial oils, which are no longer suitable for the use for which they were originally intended, and in particular used combustion engine oils and gear oils, as well as used in particular used combustion engine oils and gear oils, as well as lubricating oils, turbine oils and hydraulic oils. ²⁵⁴														
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	<table border="1"> <tbody> <tr> <td>NA</td> <td>Engine and gear box oil</td> </tr> <tr> <td>NA</td> <td>Industrial oil</td> </tr> <tr> <td>NA</td> <td>Metal working oils and other oils leading to emulsions</td> </tr> <tr> <td>NA</td> <td>2-stroke engine oil (lost oils)</td> </tr> <tr> <td>NA</td> <td>Lubricants sold inside vehicles</td> </tr> <tr> <td>NA</td> <td>Marine engine lubricating oil</td> </tr> <tr> <td>NA</td> <td>Greases</td> </tr> </tbody> </table>	NA	Engine and gear box oil	NA	Industrial oil	NA	Metal working oils and other oils leading to emulsions	NA	2-stroke engine oil (lost oils)	NA	Lubricants sold inside vehicles	NA	Marine engine lubricating oil	NA	Greases
NA	Engine and gear box oil														
NA	Industrial oil														
NA	Metal working oils and other oils leading to emulsions														
NA	2-stroke engine oil (lost oils)														
NA	Lubricants sold inside vehicles														
NA	Marine engine lubricating oil														
NA	Greases														
Scope – exempted producers	NA														
PRO(s) name(s)	It is a pre-existing PRO - like system introduced by the Law of 11 of May 2001 on the obligations of entrepreneurs with regard to the management of certain waste and the product fee.														
Existence of a central register of producer	Y														

²⁵⁰ Główny Urząd Statystyczny. Informacje o Narodowym Spisie Powszechnym Ludności i Mieszkań 2021. Stan w dniu 31 III 2021.

²⁵¹ Ibid.

²⁵² World Bank, World Bank Data: GDP per Capita in USD, available at: <https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD?locations=PL>. According to the rate exchange 1 EUR is approximately 1 USD.

²⁵³ Law of 11 May 2001 on the obligations of entrepreneurs with regard to the management of certain waste and the product fee, available at: <https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20010630639/U/D20010639Lj.pdf>

²⁵⁴ Law of 14 of December 2012 on Waste, Art), available at: <https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20130000021/U/D20130021Lj.pdf>

Final Report

entity/ies in charge of feeding it	NA BDO – Database on products, packaging and waste management ²⁵⁵								
entity/ies in charge of controlling the register	Institute for Environmental Protection-State Research Institute Ministry of Climate and Environment <table border="1" style="width: 100%;"> <tr> <td style="width: 10%;">NA</td> <td>PRO</td> </tr> <tr> <td>NA</td> <td>Environmental agency</td> </tr> <tr> <td>Y</td> <td>Environmental ministry</td> </tr> <tr> <td>NA</td> <td>Tax agency</td> </tr> </table>	NA	PRO	NA	Environmental agency	Y	Environmental ministry	NA	Tax agency
NA	PRO								
NA	Environmental agency								
Y	Environmental ministry								
NA	Tax agency								
Legislation									
EPR / collection schemes	<ul style="list-style-type: none"> - The Law of 14 of December 2012 on waste -defines waste oil and defines the handling of waste oil (chapter 5, Art. 39).²⁵⁶ - The Law of 11 of May 2001 on the obligations of entrepreneurs with regard to the management of certain waste and the product fee – introduced the obligation to recover and recycle that should be carried by the producer independently or through a recovery organisation.²⁵⁷ The Law introduces obligations on producers in the field of management of certain wastes and on product charges, imposed on producers and importers to achieve level of recovery and recycling of waste oils and lubricants, at least at the level specified in Annex. No. 4a to the Law. In case of incompliance to these obligations, producers should pay a product fee. This obligation may be fulfilled independently or through an organisation recovery. - The Regulation of 27 September 2001 of the Minister of the Environment providing a detailed classification of waste oils.²⁵⁸ - Regulation of 5 October 2015 of the Minister of Economy on the detailed manner of handling waste oils.²⁵⁹ 								
Quality standards	NA.								
Collection	According to Law of 11 May 2001 on the obligations of entrepreneurs with regard to management of certain waste and on a product fee- the obligation to recover and recycle may be carried out by the entrepreneur independently or through a recovery organisation.								

²⁵⁵ Law of 14 of December 2012 on Waste, Art), available at:
<https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20130000021/U/D20130021Lj.pdf>

²⁵⁶ <https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20130000021/U/D20130021Lj.pdf>

²⁵⁷ <https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20010630639/U/D20010639Lj.pdf>

²⁵⁸ <https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=wdu20011121206>

²⁵⁹ <https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20150001694>

	<p>Regulation of 5 October 2015 of the Minister of Economy on the detailed manner of handling waste oils provides a detailed manner of proceeding with waste oils especially in terms of their collection, storing, and labelling during the collection process.</p>
Mixing: bans and conditions	<p>A detailed method of dealing with waste oils is provided in the Law of 14 of December 2012 on Waste (art. 90 and the following). According to this regulation:</p> <ul style="list-style-type: none"> - waste oils are collected and stored selectively according to the requirements resulting from their industrial use or neutralisation; - mixing is not permitted when collecting and storing where it is technically feasible, waste oils of different characteristics shall not be mixed with each other or with other waste or substances if such mixing impedes their regeneration or other recycling-
Treatment	<p>The Law of 14 of December 2012 on Waste (art. 91 and the following) provides that waste oils should first be recovered by regeneration and in accordance to the waste hierarchy. In the light of law, the regeneration is understood as any process by which base oils can be produced by refining waste oils, and in particular by removing contaminants, oxidation products and additives</p> <ul style="list-style-type: none"> - Waste oils should be treated in accordance with the hierarchy of ways of handling waste and the requirements of the protection of human life and health and the environment, including without adverse effects on the countryside or places of special interest, especially natural or cultural sites. - Waste oils should be regenerated as a matter of priority. - Waste oils may undergo recycling other than regeneration if such recycling provides an overall result that is equivalent or better for the environment. - If regeneration of waste oils is not possible due to the degree of their contamination, these oils should undergo other recovery processes. - If regeneration or other recovery processes for waste oils are impossible, their disposal is permitted.
Export	N/A
End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	<p>According to Art.14 of 14 of December 2012 on Waste, the specified types of waste cease to be waste if the follow the recycling treatment or other recovery and fulfil all of the conditions quoted below:</p> <ul style="list-style-type: none"> a) the object or substance is to be used for a specific purpose, (b) a market or demand exists for such an object or substance,

	<p>(c) the object or substance fulfils the technical requirements for the use for specific purposes and the requirements set out in legislation, in particular in respect of chemicals and products applicable applicable to the object or substance concerned, and in the standards applicable to the object or substance,</p> <p>(d) the use of the object or substance does not lead to detrimental effects on human life, health or the environment; and the specific conditions for the end-of-waste status which are set out in the provisions of European Union law or on the elements listed above.</p>
Waste oils mass flow	
Quantities placed on the market (t)	<p>In total, according to the Energy Regulator Office, in 2021 the country generated 90 930.795 tonnes and 314 942.190 tonnes of lubricating oils were imported lubricating oils. In the overall picture, 405.872.985 tonnes of the lubricant oils were placed on the Polish market.²⁶⁰ Considering exports of 70 988.982 tonnes, it should be assumed that the domestic market for lubricating oils reached approximatively 334 884.992 tonnes. However, the fact that the sale, production and export of lubricants are not regulated by the Energy Law²⁶¹ makes it difficult to reliably estimate the real volume of the lubricants market in in Poland.</p>
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	Based on the above estimation approximatively 334 885 thousandstonnes.
Collected quantities (t)	<p>The fact that the sale, production and export of lubricants are not regulated by the Energy Law makes it difficult to reliably estimate the real volume of the lubricants market in in Poland. This allows us to assume that a large part of products qualified as lubricants is transferred to other applications as liquid fuel components or finished liquid fuels. Consequently, the annual loss to the state budget estimated at a minimum of ca. PLN 150 million as a scale of the grey market in waste oils - resulting from avoidance of product fee, VAT - may also be underestimated.</p>

²⁶⁰ Ministry of Finance and National Fiscal Administration, Counteracng Grey Zone Cooperation of the National Fiscal Administration with the gambling and waste industry, available at: https://ungc.org.pl/wp-content/uploads/2022/05/Raport_Przeciwdzialanie_Szarej_Strefie_2022.pdf.

²⁶¹ Lack of effective legal framework which sets out a comprehensive and effective oversight of the lubricants market in Poland. According to the Polish legal order, this element should be regulated in the Energy Law. In 2019 the Ministry of Economic Development and Technology and the Ministry of Finance as well as relevant sectoral stakeholders brought forward a proposition of amendment to existing Energy Law in that sense. See: https://ungc.org.pl/wp-content/uploads/2021/04/raport-OLEJE_GCNP_www.pdf

Final Report

Regeneration %	55.2% ²⁶²
Processed into fuel %	N/A
Cement/lime kilns %	N/A
Power plants %	N/A
HWI %	N/A
Other %	N/A
Collection	
Type of collected waste oils inside the collection / EPR scheme	N/A A Engine and gear box oil
	N/A A Industrial oil
	N/A A Emulsions
	N/A A Marine lubricating oil (separately)
	N/A A Marine slop oils (mixed with fuels)
Type of waste holders in the collection /EPR scheme	N/A A Recycling centres / municipalities
	N/A A Garages
	N/A A Harbours
	N/A A Inland harbours
	N/A A Small companies (e.g. farms, SMEs...)
	N/A A Industries
Existence of intermediate storage / pre-treatment facilities	Y
Collection conditions depending on stakeholders	N/A
Free collection for waste holders	For domestic oil waste holders (treated as communal waste).
Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)	N/A
Involvement of treatment operators in collection activities / schemes	N/A
Geographical coverage	N/A
Quality	

²⁶² Ministry of Climate and Environment, National Waste Management Plan 2022, available at: https://bip.mos.gov.pl/fileadmin/user_upload/bip/strategie_plany_programy/DGO/Krajowy_plan_gospodar_ki_odpadami_2022____M.P._poz._784_.pdf

Final Report

Separate collection of waste oils of different quality / composition	Yes, as indicated above.	
Key actions of the EPR / collection scheme to improve waste oil quality for regeneration	N/A	
End-treatment depending on quality	To some extent, yes. As explained above.	
Financing		
Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees	N/A	
Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions	N/A	
Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions	N/A	
Instruments to finance collection in isolated / remote areas	N/A	Differentiated fee scale
	N/A	Financing transport cost
	N/A	
Instruments to adapt financing to oil prices	N/A	
Reporting: procedure for reporting, verifications / audits	The reporting is not regulated, and there is not clear reporting obligation as the waste oil are not regulated in the energy law. There is Database of products, packaging, and waste management where some categories of waste are registered (BDO) also the President Energy Regulator Office gathers data on entities importing lubricant oil to Poland (since 2018). ²⁶³	
Collectable quantities	N/A	
Collected quantities	N/A	
Non-collected collectible waste oils	N/A	
Waste oils quality assessment	N/A	
Quantities per type of treatment and destination	N/A	
Treatment		
Geographical destination specify regional / national / Eu-wide	National	

²⁶³ Energy Regulatory Office, Liquide oils, available at: <https://bip.ure.gov.pl/bip/taryfy-i-inne-decyzje-b/paliwa-ciekle>.

Final Report

Regeneration	Y
Processed into fuel	Y
Cement/lime kilns	N/A
Power plants	N/A
HWI	N/A
Other	N/A
Illegal collection and treatment	
Fate of non-collected collectible oil	According to estimates of the Polish Economic Chamber of Eco-development, approx.86700 -95370 tonnes ²⁶⁴ waste oils are burnt in the country (in unsuitable conditions), which causes emissions to the atmosphere. ²⁶⁵ At the same time, the scale of the problem indicates that existing solutions do not provide sufficient incentive for end users to manage the waste generated in a lawful manner. Another, equally harmful less common situation is the disposal of used oils by releasing them into the environment the ground or water ground or water environment, resulting in the creation of pollution.
Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	N/A
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	As above.
Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)	Yes, this is very relevant in Poland (there is a legislative vacuum, which allows for illegal burning of the waste oil for heat production).
Legal status	Vacuum of legal status.
Quantities / proportion treated that way	Approximately 100-110 thousand m3 (could be underestimated). ²⁶⁶
Number of incidents reported	N/A
Actors	
Competent public authorities	Ministry of Environment, Ministry of Finance, Ministry of Economic Development and Technology and the Energy Regulator Office
Producer Responsibility Organisation	N/A
Key re-refiners	<ul style="list-style-type: none"> - Rafineria Nafty Jedlicze S.A. (Jedlicze), - Oiler Sp. z o.o. (Tzew),

²⁶⁴ Polish Economic Chamber of Eco-development estimates that approx.100-110 thousand m3 waste oils are burnt in the country (in unsuitable conditions), which causes emissions to the atmosphere. When aiming to calculate the number of tones this represents, the study takes an average density of 867 kg/m³ kg/m3 (IFEU/RDC (2021) Background data collection for waste oil treatment.), which results in approx 86700 -95370 tonnes

²⁶⁵ Ibid.

²⁶⁶ Ibid.

Final Report

	<ul style="list-style-type: none"> - Ośrodek Badawczo – Rozwojowy Przemysłu Rafineryjnego - „Petroil” Sp. z o.o. (Płock), - Variant S.A. (Kraków), - „Chemnaft” Sp. z o.o. (Baboszewo), - IGT Polska Sp. z o.o. (Jasło) - ORLEN Południe S.A. - Konsorcjum Olejów Przepracowanych – Organizacja Odzysku Opakowań i Olejów S.A.
Key collectors	<ul style="list-style-type: none"> - Rafineria Nafty Jedlicze S.A. (Jedlicze), - Oiler Sp. z o.o. (Tczew), - Ośrodek Badawczo – Rozwojowy Przemysłu Rafineryjnego - „Petroil” Sp. z o.o. (Płock), - Variant S.A. (Kraków), - „Chemnaft” Sp. z o.o. (Baboszewo), - IGT Polska Sp. z o.o. (Jasło)
Key producers	N/A
Bibliography	
Literature/documents/annual reports	
Contacted stakeholders	

In 2001, Poland introduced a system similar to EPR for waste disposal. However, the existing system is far from being fully effective, as the country faces a significant problem, namely that lubricating oils fall into a "grey zone". Approximately 100-110,000 m³ of waste oils are burnt in the country in inadequate facilities and disposed illegally. The legislative vacuum makes it impossible to estimate the real volume of the lubricants market in Poland. It is assumed that a large part of waste oils is transferred to other applications (e.g. the widespread phenomenon of illegal burning of waste oils) or disposed of into the groundwater and the environment (less common practices). Nevertheless, the examples given show that the existing solutions in Poland do not provide sufficient incentives for end-users to collect and treat waste oils in adequate facilities for re-refining.

To a certain extent, this is a vicious circle, as the limited guarantee of collecting a sufficient mass of oil waste leads to a lower profitability of investments in waste oil recycling activities in Poland.

The Polish waste oil landscape has significant shortcomings: instead of regenerating waste oil, other practices or disposal take precedence, which makes the implementation of the Waste Oil Directive target rather weak. Although in 2019 the proposal to reform the existing system was put forward, it seems that to date this initiative has not yet been undertaken.

Hence, Poland faces problems in waste oil management as:

- insufficient supervision of the primary market which facilitates avoidance of taxation and preventing full enforcement of obligations covered by extended producer responsibility;
- the lack of a mechanism to ensure that used oils are effectively diverted from illegal incineration into the system from their end-users;

- the absence of a mechanism to ensure that waste oils are in fact reused in accordance with their original purpose (i.e. regenerated) , instead of being processed for use as fuel.²⁶⁷

²⁶⁷ Ministry of Finance and National Fiscal Administration, Counteracting Grey Zone Cooperation of the National Fiscal Administration with the gambling and waste industry, available at: https://ungc.org.pl/wp-content/uploads/2022/05/Raport_Przeciwdzialanie_Szarej_Strefie_2022.pdf.

8.2.9. Portugal

Country	Portugal	
General data ²⁶⁸		
Population	10,276,617	
Population density (per km ²)	113	
GDP per capita (€/capita)	18,670	
EPR system (yes/no)	Yes	
Start date of the EPR	2005	
Voluntary/mandatory	Mandatory	
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	Y	Engine and gear box oil
	Y	Industrial oil
	N	Metal working oils and other oils leading to emulsions
	N	2-stroke engine oil (lost oils)
	Y	Lubricants sold inside vehicles
	P (Household oils only) ²⁶⁹	Marine engine lubricating oil
	N	Greases
Scope – exempted producers	SOGILUB is the only PRO currently approved for the management of the EPR scheme for waste oils. All lubricant suppliers must join it, except those who constitute an individual system ²⁷⁰ , as provided for in Article 7 of Decree-Law No. 152-D/2017 of 11 December. SOGILUB claims to hold 100% of the lubricating waste oil market (small proportion of free riders).	
PRO(s) name(s)	SOGILUB (Sociedade de Gestão Integrada de Óleos Lubrificantes Usados) and its registered trademark ECOLUB, created in 2007	
Existence of a central register of producer	Yes: Lubricant producers are required to register electronically via SIRER ²⁷¹ (platform supported in SILiAmb)	
entity/ies in charge of feeding it	The system is managed by the APA (Portuguese Environment Agency).	
entity/ies in charge of controlling the register		PRO
		Environmental agency

²⁶⁸ Eurostat 2019

²⁶⁹ International waste oils, used in particular by commercial vessels (marine sludge) are managed by the MARPOL system, outside SOGILUB

²⁷⁰ According to the APA, there are no individual systems authorized in practice.

²⁷¹ <https://apambiente.pt/index.php?ref=16&subref=84&sub2ref=212>

Final Report

	V	Environmental ministry
		Tax agency
Legislation		
EPR / collection schemes	<p>The general principles of Portuguese EPR schemes are established in <i>Articles 10 to 20 of Decree-Law No. 152-D/2017</i>.²⁷²</p> <p>Principles applied for oils are established in <i>Articles 44 to 51</i>.</p> <p>Principle of waste hierarchy: regeneration, other forms of recycling (processed into fuel or waste oils mixed with clay for construction, isolation etc) and then other forms of recovery.</p> <p>The EPR management by the PRO is granted by licence, a text that sets out numerous obligations on the part of the PRO in terms of planning, budget management, reporting, control and collaboration with other stakeholders. The current licence was granted in 2021 and will last 5 years.</p> <p>The PRO's collection and regeneration targets are defined in the PRO's licence:</p> <p>Collection: 100% collection Regeneration: From 80% in 2021 to 82% in 2025</p>	
Quality standards	<p>Yes: Waste management operators (collection and storage) have to meet the technical requirements of quality and efficiency defined by the APA²⁷³ and the DGAE²⁷⁴ defined after consultation with other stakeholders (PROs, regeneration and recycling operators, petroleum products industry).</p>	
Collection	<p>Regulatory obligation: collection of waste oils must be free of charge for waste holders (as long as waste oils are not contaminated and waste holders are obliged to return their waste to the PRO or individual system).</p> <p>The APA also provides requirements for the waste oils storage by operators (prohibition of storage in flood-prone areas, separate storage of waste, especially highly flammable waste, and in such a</p>	

²⁷² https://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=2953&tabela=leis

²⁷³ Environment Agency (Agência Portuguesa do Ambiente)

²⁷⁴ Directorate General for Economic Activities (DGAE, which depends on the Ministry of Economy)

Final Report

	way as to avoid contamination, protection and ventilation requirements, etc.) ²⁷⁵ .
Mixing: bans and conditions	<p>According to Decree-Law No. 152-D/2017, it is forbidden mixing used oils of different characteristics, as well as mixing used oils with other types of waste or substances, when the mixture in question prevents treatment of waste oils within the scope of individual or integrated management systems.</p> <p>SOGILUB plans to start a program in 2023 on the collection of brake oil in order to separate oils (for example, provide waste holders with another drum labelled “brake fluid” to avoid them to mix this liquid with waste oils).</p>
Treatment	<p>All collected waste oils pass through dedicated pre-treatment facilities before being sent to recycling/recovery facilities.</p> <p>For waste oils the threshold values for regeneration are 1% water, 1% sediment, 50ppm PCB, 2000ppm Chlorine, density 0.8 to 1, flash point 120°C, viscosity 1-100mm²/s at 40°C.).</p>
Export	<p>Exporters do not pay the fee, it is only for lubricants placed on the market in Portugal.</p> <p>There is no ban related to export of waste oils sent for energy recovery, but the PRO has a 100% target of recycling that has been accomplished.²⁷⁶</p>
End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	No
Waste oils mass flow	
Quantities placed on the market (t) ²⁷⁷	76,247 tonnes of oils and greases in total (including 61,128 tonnes paying the Ecovalor (2021))
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	44%
Collected quantities (t)	29 300 tonnes (2021)
Regeneration %	82% of pre-treated oils (In 2021, of the 25,826 tonnes of pretreated oils, 21,130 tonnes were sent to regeneration)

²⁷⁵ https://apambiente.pt/_zdata/Politicar/Residuos/Nota%20tecnica_armazenagem%20leos%20usados.pdf

²⁷⁶ The competent authority does not refuse the export of waste oils for being sent to energy recovery, based on the waste shipment legislation.

²⁷⁷ Sogilub activities report (2021)

Final Report

Recycling %	18% (In 2021, of the 25,826 tonnes of pretreated oils, 4,696 tonnes were recycled) Waste oil is used in a clay beads fabrication process, partly at least for its lubricating properties. This is a lost application, waste oil is burned during the process.												
Processed into fuel %	-												
Cement/lime kilns %	-												
Power plants %	-												
HWI %	-												
Other %	-												
Collection													
Type of collected waste oils inside the collection / EPR scheme	<table border="1"> <tr> <td>Y</td> <td>Engine and gear box oil</td> </tr> <tr> <td>Y</td> <td>Industrial oil</td> </tr> <tr> <td>N</td> <td>Emulsions</td> </tr> <tr> <td>N</td> <td>Marine lubricating oil (separately)</td> </tr> <tr> <td>N</td> <td>Marine slop oils (mixed with fuels)</td> </tr> </table>	Y	Engine and gear box oil	Y	Industrial oil	N	Emulsions	N	Marine lubricating oil (separately)	N	Marine slop oils (mixed with fuels)		
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Type of waste holders in the collection /EPR scheme	<table border="1"> <tr> <td>Y</td> <td>Recycling centres / municipalities ²⁷⁸</td> </tr> <tr> <td>Y</td> <td>Garages</td> </tr> <tr> <td>Y</td> <td>Harbours</td> </tr> <tr> <td>Y</td> <td>Inland harbours</td> </tr> <tr> <td>Y</td> <td>Small companies (e.g. farms, SMEs...)</td> </tr> <tr> <td>Y</td> <td>Industries</td> </tr> </table>	Y	Recycling centres / municipalities ²⁷⁸	Y	Garages	Y	Harbours	Y	Inland harbours	Y	Small companies (e.g. farms, SMEs...)	Y	Industries
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Y	Garages												
Y	Harbours												
Y	Inland harbours												
Y	Small companies (e.g. farms, SMEs...)												
Y	Industries												
Existence of intermediate storage / pre-treatment facilities	Yes, there are 4 pre-treatment facilities.												
Collection conditions depending on stakeholders	<p>The collector must collect all of the waste oil but is free to organise the collection round according to the quantity.</p> <p>The PRO license defines that if the quantity involved in the request of the waste holder is equal to or greater than 400 litres, the collector must guarantee the collection and transport of used oils within a maximum period of 15 days from the waste holder 's request, with the exception of cases where it is agreed between the parties a different period.</p> <p>70% of waste oils holders are garages and 30% are from the industry.</p>												

²⁷⁸ the PRO does not provide financial support to local authorities for the collection of waste oils from households at civic amenity sites, but **provides the containers.**

Final Report

Free collection for waste holders	Regulatory obligation that collection of waste oils must be free for waste holders (as long as waste oils are not contaminated) and waste holders are obliged to return their waste to the PRO
Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)	<p>Contracting: Each license is issued for 5 years. For each new license, SOGILUB selects waste management operators through tenders, and then usually UNIOIL consortium responds to the call for tenders (they have been responding to this tender for 15 years)²⁷⁹.</p> <p>Registration of waste holders: All waste holders are registered in the information system - Mapa Integrado de Registro de Residuos (MIRR), managed by public authorities.</p>
Involvement of treatment operators in collection activities / schemes	The collector EGEO is currently building a regeneration facility, which should be finished early in the second half of 2023.
Geographical coverage	Each operator manages collection and storage exclusively in its own geographical area.
Quality	
Separate collection of waste oils of different quality / composition	A collector can mix all types of oils or separates oils with a truck composed of different compartments (on average 3 compartments) or with another truck collecting barrel (for example barrels for brake fluids or colleens)
Key actions of the EPR / collection scheme to improve waste oil quality for regeneration	<p>Awareness and education campaign SOGILUB is in charge of the communication of the “good practices” and has developed a “Producers manual” explaining the legislation and how waste holders should not mix waste oils and how they have to store them. SOGILUB has also a newsletter and organises training sessions for waste holders to help them manage waste oils.</p> <p>The collector CARMONA organises consulting operations to help waste holders to separate their oil, and to check if they are well registered in the system.</p> <p>Quality control: For each point of collection, the collector takes two samples of waste oil (One is kept by the waste holder, and the other is stored by the collector):</p>

²⁷⁹ Only a small amount of oil is not integrated to the SOGILUB system: few small operators already have permits to collect so they are not part of the consortium

	<ul style="list-style-type: none"> • When the truck arrives to the pre-treatment facility, the waste oil of the truck is analysed in a laboratory • The cost per sample depends on the parameters tested, but on average it's 130 € per truck for all mandatory parameters. <p>If waste oils are contaminated (for instance if the level of PCB measured exceeds a quantity), the collector will analyse all samples from waste holders to identify the waste holder responsible for the contamination. The responsible waste holder has to pay for the entire collection (truck) of the contaminated oil.</p> <p>If the waste holder wants to verify, he can use his own sample and send it to an independent laboratory for a double checking.</p> <p>At the end of the pre-treatment process, the collector writes a report on pre-treated oils characteristics and then, depending on this report, the pre-treated oils can be regenerated, recycled or recovered for energy purposes.</p> <p>A solution to empower waste holders is to make them pay: SOGILUB is thinking of implementing the same quality control for water and sediment. Waste holders delivering waste oils with a high amount of water or sediments will pay for the collection (Today, the cost is already passed on waste holders for PCBs and chlorine contaminations)</p>
End-treatment depending on quality	If saponification ²⁸⁰ is observed, the oils cannot be regenerated, because it means that waste oils are contaminated. The sources of saponification are not identified. The waste oils that lead to saponification come mainly from garages.
Financing	
Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees	<p>SOGILUB has 2 major incomes:</p> <ul style="list-style-type: none"> Ecovalor (75%), the financial contribution paid by oil producers (Every producer pays a fee of 53 euros per tonnes of new oils placed on the market in 2021) Waste oils sales (25%) <p>Sales depend on oil prices: If prices are higher, the Ecovalor can be lower. This model of re-evaluation of the fee is annually approved by the</p>

²⁸⁰ Chemical reaction when the oil has soap-like characteristics.

Final Report

	APA and DGAE (can be made more frequent if needed).
Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions	SOGILUB finances free collection, storage and analysis/treatment SOGILUB implemented a modulation of fees for environmental-friendly lubricants placed on the market: Lubricant producers can have a bonus on the Ecovalor depending on criteria (for example the biodegradability of oils placed on the market or incorporation of regenerated base oils in lubricants).
Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions	No
Instruments to finance collection in isolated / remote areas	Yes Differentiated fee scale
	Yes Financing transport cost: The costs incurred by the sea transport are covered by the higher financial support of SOGILUB in Madeira and the Azores.
Instruments to adapt financing to oil prices	Prices for the waste oils take-back by the PRO are reviewed every six months via a formula that takes into account the price of diesel fuel and inflation.
Reporting: procedure for reporting, verifications / audits	
Collectable quantities	NA
Collected quantities	SOGILUB has a platform where the collectors report the information regarding the collection sites (quantity, request of the clients)
Non-collected collectible waste oils	NA
Waste oils quality assessment ²⁸¹	Two cases of waste oil contaminated by PCBs above the legal limit were identified and reported to the Portuguese Environment Agency in 2021. It represents 3 487 tonnes.
Quantities per type of treatment and destination	<ul style="list-style-type: none"> SOGILUB sells waste oils and has therefore direct access to information about final treatment.
Treatment	
Geographical destination specify regional / national / Eu-wide	All waste oils are treated in Portugal.
Regeneration	National.

²⁸¹ For waste oils sent to regeneration

Final Report

Processed into fuel-	
Cement/lime kilns	-
Power plants	-
HWI	-
Other	-
Illegal collection and treatment	
Fate of non-collected collectible oil	Some waste holders still send their waste oils to illegal collectors (collectors without a license ²⁸²) who produce illegal fuels (burning waste oils). When diesel prices are high, illegal collections are more frequent. These situations have been reported by APA to the inspection authorities and the legislation was reinforced to penalize the collection of oils by operators not contracted by Sogilub.
Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	Public authorities are not aware of the existence of illegal transfers of waste oils, involving Portugal. if it happens, public authorities will act in accordance with the provisions of regulation (EC) n. 1013/2006 on waste transfers
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	Some garages put the waste oils in the residual municipal waste All illegal disposals communicated to APA are reported to the inspection authorities.
Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)	Yes
Legal status	Waste holders are responsible for ensuring the adequate storage of waste oils in accordance with Decree-Law No. 152-D/2017. When situations of non-compliance are identified, SOGILUB must inform APA within 24 hours and the waste holder becomes responsible for the waste oils financial management.
Quantities / proportion treated that way	NA
Number of incidents reported	NA
Actors	
Competent public authorities	Portuguese Environment Agency (APA): Agência Portuguesa do Ambiente Directorate General for Economic Activities (DGAE)
Producer Responsibility Organisation	SOGILUB, ECOLUB
Key re-refiners	There are 2 treatment facilities: ENVIROIL: for regeneration and recycling (energy recovery with manufacture of

²⁸² Or operators not contracted by SOGILUB even though they have a license.

Final Report

	HFO fuel for industrial or household heating) ARGEX for recycling (expanded clay producer) ²⁸³ A new regeneration facility should open in 2023
Key collectors	9 collection companies (e.g. Carmona, EGEO) including 4 pre-treatment operators.
Key producers	SOGILUB had a total of 717 producers participating in SIGOU in 2021 (Integrated System of Waste Oil Management)
Bibliography	
Literature/documents/annual reports	Sogilub activities report (2021) ²⁸⁴ ADEME - European review of extended producer responsibility (EPR) schemes for lubricants (2021) ²⁸⁵ SOGILUB Institutional film ²⁸⁶
Contacted stakeholders	CARMONA (waste management company with a pre-treatment facility) EGEO (waste management company with a pre-treatment facility) ECOLUB (PRO APA (Environment Agency)

Conclusion

All stakeholders interviewed on the functioning of EPR are satisfied with the EPR system, which achieves high collection and regeneration performance.

All of the industry stakeholders agreed that the collected quantity was not a problem in Portugal due to the free collection system and stressed that the main issue was to improve the quality of the collected waste oils in order to send more waste oils for regeneration, as some garages mix types of oils (freezers liquid, brake oils etc).

Stakeholders also agreed that it would be beneficial to introduce more controls, by public local authorities, on waste holders waste oils storage practices, as this would reduce the contaminated waste oils (representing around 12% of the collected waste oils according to SOGILUB annual report to APA) by encouraging waste holders to separate the different types of oil.

²⁸³ The waste oils, used as a blowing agent, are added to the clay paste (in a process of incorporation of raw material) that is introduced in a kiln, causing the release of volatiles and obtaining a strong and light material.

²⁸⁴https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKFwip6NK1x4z4AhUS16QKHY-ADbsQFnoECA0QAO&url=https%3A%2F%2Fwww.sogilub.pt%2Fwp-content%2Fuploads%2F2022%2F04%2FResumo-RAA-2021.pdf&usq=AOvVaw1cxxK0x6WI_7XBz3sYyBO

²⁸⁵<https://bibliographie.ademe.fr/dechets-economie-circulaire/4507-bilan-europeen-des-filieres-a-responsabilite-elargie-des-producteurs-rep-pour-les-lubrifiants.html>

²⁸⁶ <https://www.youtube.com/watch?v=7I5tyd8aBMc>

8.2.10. Spain

Country	Spain															
General data																
Population	47,350,000															
Population density (per km ²)	93,579															
GDP per capita (€/capita)	23,510 (2021)															
EPR system (yes/no)	Yes															
Start date of the EPR	2006															
Voluntary/mandatory	Mandatory															
Scope – type of lubricants Y: Yes, N: No, P: partially, NA: information not available	<table border="1"> <tr> <td>Y</td> <td>Engine and gear box oil</td> </tr> <tr> <td>Y</td> <td>Industrial oil</td> </tr> <tr> <td>NA</td> <td>Metal working oils and other oils leading to emulsions</td> </tr> <tr> <td>Y</td> <td>2-stroke engine oil (lost oils)</td> </tr> <tr> <td>N</td> <td>Lubricants sold inside vehicles*</td> </tr> <tr> <td>N</td> <td>Marine engine lubricating oil</td> </tr> <tr> <td>N</td> <td>Greases</td> </tr> </table> <p>* Lubricants sold inside vehicles are covered by other EPR schemes (ELV and WEEE), put in action through Royal Decree 20/2017.</p>		Y	Engine and gear box oil	Y	Industrial oil	NA	Metal working oils and other oils leading to emulsions	Y	2-stroke engine oil (lost oils)	N	Lubricants sold inside vehicles*	N	Marine engine lubricating oil	N	Greases
Y	Engine and gear box oil															
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Scope – exempted producers	Electronic and electrical equipment producers (lubricants covered by the EEE EPR scheme; Royal Decree 110/2015)															
PRO(s) name(s)	SIGAUS and SIGPI															
Existence of a central register of producer	Yes															
entity/ies in charge of feeding it	ASELUBE/AFILUB ASELUBE regroups companies established in Spain that carry out one or more of the activities related to the production, marketing and distribution of lubricants (members of SIGAUS). AFILUB rather represents smaller, independent lubricant manufacturers (members of SIGPI).															
entity/ies in charge of controlling the register	Unavailable information															
Legislation																
EPR / collection schemes	Royal Decree 679/2006 : Implementation of EPR scheme aiming to establish measures to prevent the environmental impact of industrial oils, as well as to reduce the generation of waste oils after their use or, at least, to facilitate their recovery, preferably by regeneration or other forms of recycling.															
Quality standards	Royal Decree 679/2006 Industrial oils made from base oils obtained from regenerated waste oils shall meet the technical specifications															

Final Report

	<p>and safety conditions required of the corresponding new oils for the uses to which they are used.</p> <p>Oils containing over 50 ppm of PCBs are excluded, and water contents should not exceed 8% for regeneration purposes.</p>
Collection	<p>Royal Decree 679/2006: Since 2006 the objective fixed for collection rates is of 95% of collectable quantities.</p> <p>The collection and transport operations of used industrial oils must be carried out by authorised operators. They will also implicate the handing over (by waste holders) of a report sheet specifying technical information about collected waste oil (including traceability, quantities and quality).</p> <p>Articles 27 and 29 of Law 22/2011 of 28 July 2011 on Waste and Contaminated Soil: Collectors are responsible for the collected oils and for sending them to an authorised treatment centre.</p>
Mixing: bans and conditions	<p>Royal Decree 679/2006 : Holders of waste oils must avoid mixing with water or other waste.</p> <p>Legislation does not, however, forbid the mixing of substances as long as regeneration efficiency is not negatively affected as a consequence of it.</p>
Treatment	<p>Royal Decree 679/2006 : Treatment facilities must keep a register of information on quantities, quality, origin, location, dates of delivery and receipt.</p> <p>Quality assessment of waste oils and storage/treatment conditions depend heavily on local requirements. When registering as a collector in a given region, the local administration grants authorization and communicates on specific requirements for collection and storage.</p> <p>Recovery targets are fixed at 100% of waste oils collected. Since 2008, regeneration targets have been fixed at 65% of recovered waste oils.</p> <p>Articles 27 and 29 of Law 22/2011 of 28 July 2011 on Waste and Contaminated Soil: Treatment facilities must be authorised by the Autonomous Communities.</p>
Export	<p>Royal Decree 679/2006 : Exported/imported WO is not financed by the EPR scheme.</p> <p>Exporting of waste oils is not forbidden nor limited, but is to be declared and in accordance to Council Regulation (EEC) No 1013/2006 of 14 June 2006.</p>
End-of-waste criteria for mineral and synthetic waste oils, either for conversion into fuels or for other uses.	<p>APM/205/2018: From 2021 on, only to facilities authorized through a specific waste treatment permit can be granted end-of-waste criteria. This was put in place in order to limit illegal treatments of oils.</p>

Final Report

	The order also establishes that used oil processed for sale as fuel cannot contain more than 5 ppm (parts per million) of metal such as nickel, chromium, cadmium, lead, arsenic and others, less than 1 ppm of PCB and less than 50 ppm of halogenated organic compounds. In case those requirements are not met, the end-of-waste criteria is not reached.
Waste oils mass flow	
Quantities placed on the market (t)	264,717 tonnes in 2020 ²⁸⁷ , originating from: The automotive sector (55%) Industries (43%) Others (2%)
Proportion of lubricants placed on the market that end up as waste oils (part of lubricants is lost)	Calculations of collection and capture rates from the Spanish authorities imply a proportion of lubricant ending up as waste oils approximating 48% (calculation methods leading to these estimates are however unknown) ²⁸⁸ . Notably, 4.5% of lubricants on the market are sold with vehicles and ultimately exported.
Collected quantities (t)	121,004 net tonnes of waste oils in 2020 ²¹ (and 40,000 additional tonnes of water and residual substances), declined as such: 40% from garages 30% from industry 30% from other sectors <u>Capture rate is therefore of 45.71%</u> ²⁸⁹ Based on the Spanish authorities' estimations of a 48% conversion of quantities placed on the market into eventual waste oils, <u>collection rate is of 95%</u> ²⁹⁰ . For most collectors, the average yearly collection approximates 3,000 tonnes.
Regeneration %	73.89 % of collected waste oils (2020), with an efficiency of oil regeneration processes estimated to be around 60 or 70% of treated quantities.
Processed into fuel %	Information unavailable
Cement/lime kilns %	Information unavailable
Power plants %	Information unavailable

²⁸⁷ RDC Environment, ADEME (2021) Bilan européen des filières à responsabilité élargie des producteurs (REP) pour les lubrifiants.

²⁸⁸ SIGAUS (2021) Grandes cifras de 2020.

Nb: It is considered in the report that 60% of oil volume is lost during its usage, contradicting the estimation of collectable quantities being of 48%, used in the same report.

²⁸⁹ Capture rate = Collected volume of waste oils in 2020 / Volume of oils put on the Spanish market in 2020

²⁹⁰ Collection rate = Collected volume of waste oils in 2021 / Estimated volume of collectable waste oils in 2021 (48% of quantities put on the market). As estimated quantities of collectable waste oils are lower than for other MS, expressed collection rates may potentially be positively affected and therefore overestimated.

Final Report

HWI %	Information unavailable (According to ASEGRE ²⁹¹ , energy recovery as a whole seems to be declining because of decreasing demand and regeneration becoming more profitable).												
Other %	Information unavailable												
Collection													
Type of collected waste oils inside the collection / EPR scheme	<table border="1" style="width: 100%;"> <tr><td style="width: 10%; text-align: center;">X</td><td>Engine and gear box oil</td></tr> <tr><td style="text-align: center;">X</td><td>Industrial oil</td></tr> <tr><td style="text-align: center;">X</td><td>Emulsions</td></tr> <tr><td></td><td>Marine lubricating oil (separately)</td></tr> <tr><td></td><td>Marine slop oils (mixed with fuels)</td></tr> </table>	X	Engine and gear box oil	X	Industrial oil	X	Emulsions		Marine lubricating oil (separately)		Marine slop oils (mixed with fuels)		
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X	Garages												
*	Harbours												
*	Inland harbours												
X	Small companies (e.g. farms, SMEs...)												
X	Industries												
Existence of intermediate storage / pre-treatment facilities	<p>The biggest collectors rely on logistical centres to store collected waste oils, and to perform all the relevant quality assessments. The position of those logistical centres across the territory has significant influence on the profitability of waste oil collection in more remote areas or in small quantities.</p> <p>Removal of water by decantation takes place in logistical centres before the waste oil is transported towards the regeneration plants.</p> <p>PCB testing is also performed, but not systematically as it's not compulsory, and is more so based on evaluations of pollution risks linked to the type of waste holders.</p>												
Collection conditions depending on stakeholders	N/A												
Free collection for waste holders	Collection is free of charge and guaranteed for the waste holder. However, under certain conditions, the waste holder can claim economic compensation for the waste oils sold to the collectors (e.g. for long-term contracts with large waste holders of good quality waste oils).												
Conditions (contracting / registration with the PRO, volume thresholds, quality conditions)	Compensation on average by the PROs at 10€/t covers net collection (including storage) and transport cost to the treatment facilities.												

²⁹¹ ASEGRE est la fédération des gestionnaires de déchets dangereux

Final Report

	<p>Spanish principle of “reasonable profit”: cost models shall include a profit element. Location and average collected volume helped define four categories of municipalities/geographical areas (including islands), with different P&L profiles.</p> <p>Annual and quarterly studies worked on with the collectors help adapt the collection cost model, based on collector’s profit and loss accounts and on base oils and fuel prices.</p> <p>Waste oils must be stored separately, and before regeneration, their PCB and water contents must be lower than 50 ppm and 8%, respectively.</p>
<p>Involvement of treatment operators in collection activities / schemes</p>	<p>The main collection actor, SERTEGO, is also the main regeneration operator, owning 4 of the 5 active treatment sites in Spain, and producing around 65% of regenerated waste oils.</p>
<p>Geographical coverage</p>	<p>Collection is said by interviewed collectors and the PRO to cover the entire country in 2022.</p> <p>There are however significant area-dependent disparities, as 80% of waste oil generation comes from <7% of Spanish municipalities, and collectors are not restrained by any geographical limitations (free market).</p> <p>Geographical disparities and insular collection contribute heavily to the total collection costs at a national scale. They are therefore one of the biggest influences on waste oil collection profitability, and collectors need to maintain very flexible logistical mechanisms in order to adapt to those disparities (such as the construction of optimized itineraries, a fleet of lorries with various capacities and technical characteristics, etc).</p>
<p>Quality</p>	
<p>Separate collection of waste oils of different quality / composition</p>	<p>It is supposed by public authorities and PRO actors that mixing of different oils, as well as mixing of oils with other waste flows are happening on a regular basis (according to observed PCB concentrations, notably). However, the involved quantities and exact frequencies associated to those events are unknown.</p> <p>According to collection actors, it is estimated that mixing or pollution events negatively affecting regeneration the most (in terms of contaminated quantities) occur within industries, notably implicating PCBs. Mixing also frequently takes places in garages and workshops, but usually implies substances that are less detrimental to regeneration efforts, and in smaller quantities.</p>
<p>Key actions of the EPR / collection scheme to improve waste oil quality for regeneration</p>	<p>Waste holders handing in oils that are “out of specification” may be charged for collection by the collector. Collectors do not carry out systematic analyses during collection. But analyses on a case-by-case basis at their discretion.</p>

Final Report

	<p>Analyses and quality controls are carried out systematically when waste oils are transferred between collectors and processors, usually by the processors themselves (the associated costs are taken into account by the financing granted by the PROs). Collectors also analyse 10-20% of collected samples for water and chlorine contents, as well as flash point values. values (ie. flammability analysis of the samples, indicative of their purity).</p> <p>Periodic and random controls by specific authorities (e.g. fraud police) help avoiding the spreading of illegal practices such as burning of disposal of waste oils.</p>
<p>End-treatment depending on quality</p>	<p>In the events of collected waste oils not meeting quality requirements for regeneration or refusal to perform the required analyses, the collectors are responsible for managing the waste oils. They will then have to pay for appropriate transportation and treatment of the oils.</p> <p>Out-of-specification waste oils are usually processed and sent for energy recovery.</p>
<p>Financing</p>	
<p>Revenues: EPR fees or taxation amount and calculation methodology, procedure for updating the amount, modulation of EPR fees</p>	<p>EPR fee evolves around 60 €/t, or 0.054 €/litre (calculated via a study carried out by SIGAUS, based on quantities of lubricants placed on the marked collected waste oils subsidies granted by the Ministry of the Environment before the EPR took place)</p> <p>Every three months, financings are adapted according to evolving oil and fuel prices, and to field data on waste oil collection (distances, flows, etc).</p> <p>Revenues are estimated on the basis of the forecast market for lubricants and the EPR fee scale for the current year. The costs are estimated on the basis of the tonnage of waste oils to be processed and the compensation scale for the collection and treatment activity.</p>
<p>Budget: stakeholders financed by the system (waste holders, collectors, regeneration operators, other treatment operators, etc.) and amount/ conditions</p>	<p>SIGAUS had a turnover of 16.9 million € in 2019. It was allocated as follows:</p> <ul style="list-style-type: none"> - 81% for the financing of waste oil management operations (collection, transport, analysis, pre-treatment and regeneration; - 12% other operating costs (including R&D and communication costs) ; - 7% of personnel costs. <p>Reasonable profit for both collection and regeneration actors is expected as part of the EPR scheme.</p>
<p>Use of other fiscal instruments to stimulate collection / treatment: subsidies, taxes, VAT reductions</p>	<p>None</p>

Final Report

<p>Instruments to finance collection in isolated / remote areas</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30px;"></td> <td>Differentiated fee scale</td> </tr> <tr> <td style="text-align: center;">X</td> <td>Financing transport cost (differentiated freight funding by SIGAUS)</td> </tr> </table> <p>Collection in more remote areas and/or for smaller quantities lead to generalized adjustments of collection financing by SIGAUS (via zoning mechanism). SIGAUS has also implemented actor-specific differentiated financing on one specific occasion when waste oil selling prices were too low.</p> <p>Ferry transportation from islands is also financed, according to the following indexes (as of 2020): From small islands to large islands: 135.32 €/t From a large island to another, or from a large island to inland territories: 69.02 €/t</p>		Differentiated fee scale	X	Financing transport cost (differentiated freight funding by SIGAUS)
	Differentiated fee scale				
X	Financing transport cost (differentiated freight funding by SIGAUS)				
<p>Instruments to adapt financing to oil prices</p>	<p>Each year, an external company carries out a study to determine the cost model.</p> <p>P&L analyses are therefore regularly made for each activity of the value chain, taking into account handled quantities of waste oils, logistical data, and the amount of labour needed. Every quarter, the elements established in the profit and loss account of the collection cost model are adapted to variations in the base oils' prices and fuel prices (the change in fuel prices is assessed using the PLATS index).</p> <p>At the same time, the PRO notes the evolution of base oil prices on a monthly basis via the ICIS Global Petrochemical Index (IPEX) and translates this into an indexation of the financing of regeneration.</p>				
<p>Reporting: procedure for reporting, verifications / audits</p>					
<p>Collectable quantities</p>	<p>No official consolidated statistic is available on the produced/generated waste oils.</p> <p>Data used to estimate collectable quantities is: quantities of oils subject to the EPR scheme that are placed on the market. emission factor.</p> <p>It is considered by Spanish authorities that 40% of oil volumes put on the market end up as waste oils, based on a guideline report published by UNEP on waste oil management in Mediterranean countries ²⁹².</p> <p>Waste holders generating over 500 liters per year must be registered to local authorities as such, and must keep records of quantities, quality, origin and dating of waste oils generated.</p>				


²⁹² UNEP (2015) Guidelines for Environmentally Sound Management of Used Oils in the Mediterranean

Final Report

Collected quantities	<p>Collectors need to be authorized by the local authorities, allowing for better reporting of territorial actions.</p> <p>The collectors report information via the PRO's IT System. Via this system, the collectors declare to the PRO the waste oil production locations, the collected quantity, the places of delivery and the final treatment for which they are intended. In order to guarantee the accuracy of the data provided to the SIT, SIGAUS carries out audit and verification campaigns of the declarations through an external and independent team.</p>
Non-collected collectible waste oils	No information available
Waste oils quality assessment	Collectors have to report the origin, nature and quality of all waste oil flows they handle, including the result of analyses.
Quantities per type of treatment and destination	No information available
Treatment	
Geographical destination specify regional / national / Eu-wide	Proximity principle: In practice, given that the compensation for transport is estimated from a standard cost model with an average distance, collectors have an economic incentive to minimise the transport distance between collection points and treatment facilities. In addition, exported/imported WO is not financed by the EPR scheme.
Regeneration	National: Both key collectors (SERTEGO and CATOR) rely on their own treatment units for most (if not all) of the regeneration. They also import waste oil for regeneration.
Processed into fuel	National
Cement/lime kilns	Unknown
Power plants	Unknown
HWI	National
Other	Unknown
Illegal collection and treatment	
Fate of non-collected collectible oil	Unknown
Illegal shipment (imports and exports) of waste oils and the way in which this happens (e.g., transport as waste oil versus transport of end-of-life vehicles)	Illegal shipments of waste oils are considered rare, though the actual number of their occurrences is not determined.
Illegal disposal of waste oils (e.g., reported incidents involving disposal to soil or water)	Disposal events of waste oils are considered rare and uncommon, though the actual number of their occurrences is not determined.
Burning waste oils in small waste oil burners (e.g., domestic, in workshops, etc)	Oil burning in small facilities is the most common form of illegal behaviour related to waste oil in Spain. Fuels are heavily taxed in general, inciting actors to burn waste oil. It is said to be related to isolated events and observed occurrences have been decreasing in the last 5 years.
Legal status	Burning waste oil in small unauthorised facilities is considered illegal. Water dumping and ground spillage are

Final Report

	forbidden, as well as any action (including burning) leading to higher air pollution than the level set in the national legislation.
Quantities / proportion treated that way	No available information
Number of incidents reported	The proportion of illegal actions impairing waste oil collection has been impossible to approximate, and no available data was found.
Actors	
Competent public authorities	PROs are subject to control by the following public authorities: the administrations responsible for the environment and waste in the Autonomous Communities; the Ministry of the Environment.
Producer Responsibility Organisation	SIGAUS (large companies and multinationals), representing 250 companies and ~85-90% of the market. SIGPI (relatively smaller independent producers), representing ~10-15% of the market.
Key re-refiners	Seven regeneration treatment facilities are spread throughout the territory, and owned by four companies (SERTEGO, CATOR, VERKOL and “Protección Medio Ambiental – PMA”). Five of them are consistently active and make up for the vast majority of waste oil regeneration. Out of those five, four are owned and managed by SERTEGO (making up for 65% of the national waste oil regeneration), while the fifth one is owned by CATOR.
Key collectors	SERTEGO (~20-25% of waste oil collection) CATOR (~10-15% of waste oil collection) In general, Spanish waste oil collectors also collect other types of waste. They are represented at sectoral level by ASEGRE, which is the Spanish association of waste management companies. It represents about 100% of the hazardous waste management companies, including waste oil collection companies.
Key producers	Refining and petrochemical companies (73% of market quantities) Companies dedicated to the manufacture and marketing of lubricants (18%.) Other distributors (retail and wholesale). Two associations represent lubricant producers and distributors: ASELUBE (~members of SIGAUS, 84% of market) AFILUB (~members of SIGPI)
Bibliography	
Literature/documents/annual reports	SIGAUS (2021) 2020 Sustainability report: https://www.sigaus.es/en/publicaciones?id=2

	<p>RDC Environment, ADEME (2021) Bilan européen des filières à responsabilité élargie des producteurs (REP) pour les lubrifiants</p>  <p>Bilan-europeen-REP-lubrifiants-2021.pdf</p> <p>UNEP (2015) Guidelines for Environmentally Sound Management of Used Oils in the Mediterranean https://www.unep.org/resources/report/guidelines-environmentally-sound-management-used-oils-mediterranean</p>
Contacted stakeholders	<p>ASEGRE SIGAUS SERTEGO</p>

Conclusion

Considered to be of secondary importance in profitable periods, the EPR scheme is however said by collectors to be an efficient buffer dampening the impacts of geographical disparities (both on collected quantities and collection costs). Even though quantitative recovery targets are not as high as in neighbouring member states, the EPR scheme contributes to better quality standards for collection and regeneration of waste oils in Spain. It also dampens market-based practices that would lead to improper regeneration practices (in favour of quantity) or to unequal collection throughout the country. The very high collection rate objectives (as opposed to using capture rates) coupled with unclear methods of calculating quantities of collectable waste oils may however lead to an overestimation of collection efficiency, and to a possible lack of appreciation of illegal practices and non-collected quantities.

The flexibility of the EPR scheme (which adapts financings and budget models four times a year and when oil prices are detrimental to collectors) also seems to have efficiently regulated and modulated the profitability of waste oil collection, as well as its efficiency. It has also been noted by interviewed collection actors that the fact that SIGAUS is not legally the owner of waste oils (and that collectors are free to be registered to the EPR or not) allows for more control of the market by collectors, and for better collaboration of all parties involved.

The absence of control authorities specific to the EPR scheme or to waste oil collection makes it however difficult to report or act on illegal practices or non-compliance to scheme rules. Furthermore, measures meant to improve the quality of collected waste oils for regeneration seem to be both less strict and less homogeneous on a national level than within EPR schemes of neighbour countries.

The Spanish Government has reportedly started a revision of waste oil regulations towards more ambitious collection and regeneration targets. However, actors (notably ASEGRE and collection actors) expressed interest in a European harmonization of waste oil management. Evoked potential objects for harmonization notably include the scope of EPR schemes (as to which oil flows are covered by the EPR) and involved monitoring systems. According to interviewed actors, such changes would simplify and favour market exchanges with neighbouring countries. Adaptation of Spanish waste oil collection

systems towards schemes that are more similar to other member states has not been mentioned or discussed, however.

8.3. Non-EU countries

8.3.1. Australia

Legislation – The Product stewardship for oil program (PSO)

There was no regeneration of waste oils before 2000 in Australia²⁹³.

The Act and subordinate legislation were established in 2000 to provide the framework for a used oil recycling scheme in Australia, namely the Product Stewardship for Oil Scheme (PSO Scheme)²⁹⁴:

- Product Stewardship (Oil) Act 2000: Establishes the framework and rules for the PSO Scheme.
- Product Stewardship (Oil) Regulations 2000: Sets the levy and benefit rates, and product specifications for the PSO Scheme.
- Product Grants and Benefits Administration Act 2000: establishes eligibility criteria and the administrative mechanisms used by the Australian Tax Office (ATO) to pay benefits to recyclers.

In addition to the PSO, the government provides grants for the regeneration plants. These grants helped to start the investments in 2000 as regeneration plants have high fixed costs and relatively low variable costs.

Deloitte Access Economics Australia completed the fourth independent review of the *Product Stewardship (Oil) Act 2000* in 2020 with the recommendations to improve the PSO.²⁹⁵

The Department of Agriculture water and environment (DAWE) is responsible for the policy oversight of the PSO Scheme. The Australian Tax Office (ATO) is responsible for the implementation and administration of the levy collection on domestic oils and the benefit payments to recyclers. The customs area of the Department of Home Affairs is responsible for administering the PSO Scheme levy on oil imports.

The environmental laws regarding the collection of waste oils are defined by the state governments (for example, with waste oil transport regulations from the state) and not by the federal government. The waste oil collection legislation is, therefore, out of the scope of the PSO. The aim of these state government laws is to increase the collected waste oils with the PSO.

The product stewardship levy

A mandatory levy paid by oil producers and importers is collected on petroleum-based oils and their synthetic equivalents sold on the market (lubricating oils and fuel oils)²⁹⁶. It is

²⁹³ Currently, there are 5 waste oil regeneration plants in Australia.

²⁹⁴ <https://www.awe.gov.au/environment/protection/used-oil-recycling/product-stewardship-oil-program>

²⁹⁵ *Fourth Product Stewardship (Oil) Act 2000 review*, Deloitte Access Economics (2020)

²⁹⁶ Such as base oil and burner oils, as opposed to other products such as food oils and vegetable oils. Exemptions for single-use oils such as food grade white oil, polyglycol brake fluids and aromatic process oils came into effect on 15 April 2002. Since 2003, there are exemptions for specific uses of oil that do not create a recyclable waste stream and pose a low risk to the environment. 2-stroke engines oils are not exempted from PSO.

collected on specific domestically produced oils under the Excise Tariff Act 1921 and imported oils under the Customs Tariff Act 1995. Exported oil is not levied.

The levy on oil producers, which is passed on to the final user, is used to subsidise waste treatment and to finance used oil recyclers. The fee level is 0.085 AUD/l or kilogram for greases²⁹⁷.

The product stewardship benefits²⁹⁸

The PSO encourages increased collection and recycling (regeneration and conversion to distillate gasoil of used oil in Australia by providing oil recyclers with a subsidy linked to waste oil treatment (only paid after the product is recycled)).²⁹⁹

In order to be eligible for benefits, a recycling operator must:

- Be registered for PSO Scheme;
- Have an excise manufacturing licence;
- Comply with relevant Australian, state or territory legislation and requirements (particularly environmental criteria);
- Have recycled the oil being claimed and have either sold it to another entity for end-use or used the recycled oil in the refinery's own operations.

The subsidy paid for each recycled product was determined by identifying the levels of profitability of these treatment options and the environmental benefit.³⁰⁰ The Australian government defined categories appropriate for the environment³⁰¹ according to them and let the market act between them.

Table 29. Benefit for the PSO schemes categories ³⁰²

Category	Name	Benefit in cents per litre
1	Re-refined base oil (for use as a lubricant or a hydraulic or transformer oil)	50
2	Other re-refined base oils (e.g. chain bar oil, oils incorporated into manufactured products)	10
3	Automotive Diesel	7

²⁹⁷ The types of oils and greases liable to the PSO Levy are shown here: [Excise duty rates for fuel and petroleum products | Australian Taxation Office \(ato.gov.au\)](https://ato.gov.au/Excise-duty-rates-for-fuel-and-petroleum-products/) (Tariff items 15.1 to 15.4)

²⁹⁸ Note that the word benefit is used in the Australian legislation and these benefits are subsidies. To remain coherent with the term used in the Australian legislation. The word benefit is used in the Australian factsheet.

²⁹⁹ <https://www.awe.gov.au/environment/protection/used-oil-recycling/product-stewardship-oil-program/benefits>

³⁰⁰ Australian Government – Department of Agriculture, Water and Environment

³⁰¹ All these categories. The problem was illegal burning before 2000.

³⁰² Fourth Product Stewardship (Oil) Act 2000 review, Deloitte Access Economics (2020)

Final Report

4	Diesel extenders	5
5	High grade industrial burning oil	5
6	Low-grade industrial burning oils (filtered and de-watered)	3
7	Industrial process oils and lubricants, including hydraulic and transformer oils (reprocessed or filtered, but not re-refined)	0
8	Gazetted (eligible) oil consumed in Australia for a gazetted (eligible) use	8.5

This system provides incentives to move from category 5 (high-grade industrial burning oil) to category 1 (re-refined based oil used as an engine lubricant, transformer and hydraulic oil). The benefits of PSO trigger further investment in regeneration plants.

The benefit is higher for regeneration than for incineration for two reasons:

- Regeneration is more expensive than incineration
- To encourage circular economy

These benefits have remained unchanged since 2000, and are not adjusted for inflation (therefore, the benefits have decreased in real term by around 50 % since 2000).

Data

Collection rate

The majority of the waste oil is captured: the collection rate is around 90% based on the estimated collectable waste stream. The collection rate of waste oil products is between 50% and 60% of what is placed on the market. It is generally agreed that approximately 65% is the maximum achievable collection rate due to losses during usage and the presence of by-products.³⁰³

Not all oil consumed is recoverable and some is lost during use through leakages and removal of by-products. For each litre of oil collected and processed at regeneration plants, around 0.6 litres of base oil can be recovered.³⁰⁴

Even though Australia is a big country, there is a good performance of the collection system because most of the population (more than 80%) lives in relatively densely populated areas near the coasts (principally in the South-East). Only 7 % of the population is considered as remote. The mining industry that is located in remote areas uses lubricants and their waste oils are mixed with chemicals for explosives that are used locally in mining operations³⁰⁵.

³⁰³ ATO, Deloitte, EY 2016, industry estimates.

³⁰⁴ ATO, Deloitte, EY 2016, industry estimates.

³⁰⁵ Interview conducted on the 05/05/2022 with Tabor AKMAN and Nich HILLS from the Department of Agriculture, Water and the Environment (DAWE) of Australia.

Levy and benefits

Product Stewardship Oil Scheme statistics, 2020-21³⁰⁶:

- Total of all levies collected: AUD 51,876,303
- Total of the benefits payments: AUD 95,027,59

The fiscal balance of the PSO scheme has been in deficit since the increase in Category 1 volumes in 2014-15. The PSO Scheme is paying more in benefits than it receives in levies from oil manufacturers and importers.

Regeneration rate

Slightly more than 50% of waste oil collected in Australia is recycled.

Table 30. Treatment repartition for PSO schemes categories³⁰⁷

Category	Name	Treatment repartition
1	Re-refined base oil (for use as a lubricant or a hydraulic or transformer oil)	50 %
5	High grade industrial burning oil	40 %
2	Other re-refined base oils (e.g. chain bar oil, oils incorporated into manufactured products)	10 %
3	Automotive Diesel	
4	Diesel extenders	
6	Low-grade industrial burning oils (filtered and de-watered)	
7	Industrial process oils and lubricants, including hydraulic and transformer oils (reprocessed or filtered, but not re-refined)	
8	Gazetted oil consumed in Australia for a gazetted use	

Temporary situation

The levy of the oil producers was reduced in half for 6 months in 2022 due to a “cost of living” measure but the benefits remain unchanged. This revenue reduction will be covered by the government.

³⁰⁶ Australian Tax Office, financial year 2020-21

³⁰⁷ [Statistics - Product Stewardship for Oil Program - DAWE](#)

Table 31. Envisaged revisions Australia³⁰⁸

Problem	Recommendations ³⁰⁹	Revision envisaged by the government (August 2021)
<p>Greatly fluctuating oil price => need to reduce the commodity price risk for oil recyclers</p>	<p>Enabling the PSO Scheme benefits to change with oil prices to protect oil recyclers against fluctuations in crude oil prices. This could avoid the need for emergency industry support from the government during times of low oil prices, such as provided in 2020.</p>	<p>Variable benefit rate linked to oil prices, indexed adjustment: whether Consumer Price Index, Producer Price Index or another index.</p> <p>A one-off adjustment to benefits to an appropriate level.</p> <p>=> As operating expenses and wages increase with inflation and wage growth, this would ensure that the costs of re-refining do not become disproportionately higher than the financial incentive to re-refine</p>
<p>There is a deficit because the benefit payments of the first category are increasing (due to increasing volumes in category 1 which has the biggest benefit payment).</p> <p>Category 1 re-refined base oil, for use as a lubricant or a hydraulic or transformer oil) has the highest benefit rate.</p>	<p>Increase the levy to address the deficit. Ex: the PSO levy was last increased in the 2014-15 financial year from 5.499 cpl³¹⁰ to 8.5 cpl to increase revenue and assist the PSO Scheme to operate in surplus</p>	<p>In discussion</p>
<p>Lack of transparency in the reporting of information and data relevant to the PSO Scheme</p>	<p>Reinstating the publication of PSO Scheme information in Departmental Annual Reports (Ex: the volume claimed in each category, levies</p>	<p>Work will commence to publish data on the department's website subject to tax secrecy provisions and through annual reporting requirements.</p>

³⁰⁸ The Australian Government response to the independent report: Product Stewardship (Oil) Act 2000 is here: [Australian Government response to the independent report: Fourth Product Stewardship \(Oil\) Act 2000 review - DAWE](#)

³⁰⁹ Fourth Product Stewardship (Oil) Act 2000 review, Deloitte Access Economics (2020)

³¹⁰ AUD cents per litre.

	collected, benefits paid, and the government resources allocated to administration.)	
Procedural inefficiency within the PSO Scheme (administrative burden of the declarations)	Streamline this process by allowing PSO Scheme clients to submit all this information at once on a monthly basis. => could reduce the administrative burden for stakeholders	It is noted that from 1 July 2021 some PSO participants are able to request a move from weekly to monthly lodgement of excise returns due to the expansion of a number of measures to reduce administrative burdens (Treasury Laws Amendment (A Tax Plan for the COVID-19 Economic Recovery) Bill 2020).

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8.3.2. USA

In the United States, the management of waste oil is decentralised. Product stewardship legislation is in the hands of state and local governments. 37 states have a disposal ban for waste oil, whilst only 8 states enforce mandatory recycling (regeneration and production of distilled gas oil).³¹¹ The focus of this report will be on California, which has one of the largest state oil recovery programs in the US.³¹²

Legislation - The California Oil Recycling Enhancement Act

The California Used Oil Program is legislated by the California Oil Recycling Enhancement Act, passed by the State legislature in 1991 to address the management of used oil, given the significant threat its improper disposal posed to California's environment.

This program established a network of over 2,600 state-wide collection points but also focuses on efforts to inform and motivate the public to use them.

The California Oil Recycling Enhancement Act is administered by the California Department of Resources Recycling and Recovery (CalRecycle), a branch of the California Environmental Protection Agency that oversees the state's waste management, recycling, and waste reduction programs.

The fee structure

Every oil manufacturer, who sells lubricating or industrial oil in the state, must report to the board each month the amount of lubricating or industrial oil sold.

- Every oil manufacturer has to pay to CalRecycle (on or before the last day of the month following each quarter) \$0.24 for every gallon (0.06 €/l³¹³) of lubricating oil sold or transferred in California or imported into California for use in California.
- Every manufacturer of finished lubricant containing at least 70 percent re-refined base oil lubricant has to pay \$0.12 (0.03 €/l) for every gallon sold or transferred in the state or imported into the state. In other terms, this is a modulation of the financial contribution for lubricant oil formulations placed on the market incorporating at least 70% of regenerated base oils (50% bonus or discount).

Organisation of the scheme

California State collects taxes on lubricants to finance:

- **Collection.** Registered industrial waste generators (which buy and use lubricating oil only for equipment owned or used by these entities), curbside collection programs ("door-to-door" collection)³¹⁴, and certified collection centres are eligible to receive an incentive payment from CalRecycle. Certified used oil centre managers will not accept used motor oil that has

³¹¹ Northeast Recycling Council (NERC), Disposal Bans & Mandatory Recycling in the United States (1 July 2020)

³¹² Fourth Product Stewardship (Oil) Act 2000 review, Deloitte Access Economics, 2020

³¹³ With 3.79 litres in a gallon and 1\$ = 0.92 €

³¹⁴ Many communities have a "Curbside collection program" that allows households to leave their oil at the curb (properly packaged) on a monthly or more regular basis, potentially along with other recyclables e.g. packaging

been contaminated with other fluids such as antifreeze, solvents, gasoline, or water.³¹⁵ The generated revenue is refunded to certified collectors through a return incentive of \$0.40 per gallon (0.10 €/l) to certified curbside and \$0.16 per gallon (0.04 €/l) to industrial collectors. There is also a local used oil collection program to ensure that at least one certified used oil collection centre is available for every 100,000 residents not served by curbside waste oil collection. This centre accepts oil from the public at no charge, during the hours the centre is open for business and provides used oil collection at least once a month.

- **Contaminated Oil Reimbursement Program** to increase waste oil quality in view of regeneration: CalRecycle can reimburse the additional disposal and clean-up costs of the contaminated oil that exceed the cost of picking up the same amount of uncontaminated oil.³¹⁶
- Certified Collection Centers, Curbside Collection Programs and Publicly funded used oil collection sites located in rural counties (with an annual disposal volume under 200,000 US tons) are eligible to file for Contaminated Oil Reimbursement.
- **Recycling (regeneration and conversion to distillate gasoil):** CalRecycle promotes the recycling of used lubricating oil into re-refined oil by paying a re-refining incentive to certified recycling facilities for re-refined oil produced from used oil. Such oil recycling facilities can be in or outside of the state but have to be certified.
- **Education:** The used oil collection program also includes a public education and awareness program to promote used oil recycling opportunities and educate the public on its benefits. Calrecycle issues grants to local city/county through the Oil Payment Program (OPP). The OPP money can be used to start used oil and oil filter collection programs, educate the public about appropriate disposal of oil and filters and recyclers, and assist certified centres. Calrecycle provides a maximum of \$11 million per fiscal year for this program. Actual budget amounts are determined annually as part of the State budget process. Payments are calculated per capita using the Department of Finance's population statistics (minimum of \$5,000 and \$10,000 for cities and counties).

Who can benefit from the scheme?

- General Public: households can take their oil to a Certified Collection Centre (CCC) or can leave their oil for free at the curb if there is a curbside recycling program.
- Businesses or local entities: if small quantities of used oil are regenerated, they can also take their oil for free to a CCC. If the quantity is between 5 and 55 gallons (19 and 208 litres), it is recommended to call a CCC in advance. If the quantity exceeds 55 gallons, they need to register as an industrial generator and then a certified hauler will pick up their used oil.

³¹⁵ Before collecting, the collector must ask the waste holders if anything has been added to the waste oil, such as gasoline, solvents, antifreeze, paint, or other household products. They must also examine the waste oil to see if it has signs of layering, dirt or debris floating in it, or has an unusual color or obvious odor. If the waste holder mixed oils or if it appears contaminated, they must collect the waste oil.

³¹⁶ They need to file a contaminated used oil reimbursement application with the following information: lab tests showing the type and level of contamination, a copy of the uniform hazardous waste manifests or manifest receipts showing all transportation of the contaminated oil, amount of actual total disposal and clean-up costs minus the amount normally charged to pick up the same amount of uncontaminated oil and a copy of the invoice or receipt from a used oil hauler showing the disposal, clean-up costs related to the contaminated oil and a detailed explanation of how the event occurred (summary of events) and a copy of the site's established procedures for preventing future contamination of oil with hazardous waste.

Certified haulers take the oil from the collection centres or generators to a recycling facility.

- Growers and Ranchers: Growers and ranchers have the same options as other businesses and can also drop off (at no charge) up to 55 gallons (208 litres) of used oil at specific participating collection centres.

Collection rate (2012)³¹⁷

- Total sales: 669 000 tonnes
- Recoverable dry oil³¹⁸: 413 000 tonnes
- Used oil collected: 366 000 tonnes

Around 62% of lubricants are recoverable at the end-of-life. Around 89% of recoverable dry oils are collected and around 55% of lubricants sold on the market are collected.

In 2012, the recycling rate (regeneration and conversion to distillate gasoil³¹⁹) for used oil in California was approximately 70%. There is still a significant quantity of oil thought to be recoverable whose fate is unknown, amounting to as much as 20–30% of recoverable oil.³²⁰

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<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwj2iJu2yeH4AhWzIMUKHewmAHoQFnoECBQQAQ&url=https%3A%2F%2Fwww.a.gov.au%2Fsites%2Fdefault%2Ffiles%2Fdocuments%2Ffourth-product-stewardship-oil-act-review.pdf&usg=AOvVaw2jCNESKQxUjQXZuW-hfEX3>

<https://www.agriculture.gov.au/sites/default/files/documents/aus-govt-response-product-stewardship-oil-review.pdf> Used Oil Management: Health and Safety Code, Section 25250.1-25250.25

(https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=HSC&division=20.&title=&part=&chapter=6.5.&article=9.1.)

Used Oil Recycling Enhancement Act: Public Resources Code, Section 48600 et seq. (https://leginfo.legislature.ca.gov/faces/codes_displayexpandedbranch.xhtml?tocCode=PRC&division=30.&title=&part=7.&chapter=4.&article=)

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Northeast Recycling Council (NERC), *Disposal Bans & Mandatory Recycling in the United States* (1 July 2020)

³¹⁷ Kuczenski, Brandon, et al. "Material flow analysis of lubricating oil use in California." *Resources, Conservation and Recycling* 93 (2014): 59-66

³¹⁸ Collectible waste oils.

³¹⁹ Conversion to distillate gasoil is not viewed as recycling in the UE.

³²⁰ Fourth Product Stewardship (Oil) Act 2000 review, Deloitte Access Economics, 2020

Final Report

(<https://nerc.org/documents/disposal%20bans%20mandatory%20recycling%20united%20states.pdf>)

<https://calrecycle.ca.gov/usedoil/>

8.3.3. Turkey

Legislation

The first legislation in Turkey on the management of waste lubricants and industrial oils entered into force on January 21, 2004. This legislation sets guidelines for registration, collection and disposal of waste lubricants and industrial oils aligned with the EU standards. Since its adoption, the legal framework has been amended twice^{321 322}.

Waste lubricants and industrial waste oils are currently managed in accordance with the guidelines of the "Regulation on Management of Waste Oil"³²³.

This regulation aims to determine the procedures and principles for the protection of the environment and human health and the efficient use of natural resources by specifying the technical and administrative guidelines regarding the temporary storage, collection, transportation, regeneration, energy recovery and disposal of waste oils.³²⁴

An amendment was made^{325,326} to set concrete targets for the collection of waste oils³²⁷:

- 25% of the produced lubricants are aimed to be collected by lubricant producers and distributors in 2024.
- By 2024, mineral oil products must consist of at least 15% re-refined base oils (recycled content target). This is the only benchmarked country which has implemented such a policy.

Mineral Oil Manufacturers are not allowed to mix waste oils with other types of waste oils, water, solvents, other toxic and dangerous substances/waste.³²⁸ Mineral Oil Manufacturers based on the amendment from 23th December 2020 of the 2019 regulation on the Oil waste are also obliged to collect 10% of the mineral oil they provide for the markets in 2021.³²⁹ This number goes up to 15% for 2022, 20% for 2023 and 25% for 2024. They

³²¹ Respectively on July 30, 2008 and December 21, 2019.

³²² PETDER, 2020 Annual Activity Report, October 2021, page: 10.

³²³ Which came into force after it was published in the Official Gazette on December 21, 2019.
<https://www.resmigazete.gov.tr/eskiler/2019/12/20191221-1.htm>

³²⁴ Official Gazette of the Republic of Turkey, Waste Oil Management Regulation, 21.12.2019, issue: 30985, article: 1

³²⁵ On December 23, 2020.

³²⁶ Also, after the amendment the collected waste oils are registered to the MoTAT (Mobile Hazardous Waste Tracking System) by the waste oil producers to be monitored by official authorities. MoTAT is a system that aims to track the transportation of hazardous waste materials with the use of GPS supported devices, these hazardous materials include waste oils as well. MoTAT was introduced with the "Communiqué on the Transportation of Waste Materials on Road", which came into force after it was published in the Official Gazette on March 20, 2015.

³²⁷ Interview conducted on the 26/04/2022 with the representative of TAYRAŞ and GEIR

³²⁸ Official Gazette of the Republic of Turkey, Waste Management Regulation, 02.04.2015, issue: 29314, article 2

³²⁹ It is not an EPR scheme per se, however, it sets certain targets regarding the collection and treatment of waste oils in Turkey.

also have to use a set amount of base oils produced from waste oils in their products. This amount is 8% for 2022, 12% for 2023 and 15% for 2024.³³⁰

Refinery facilities are obliged to obtain waste oil refining and base oil production permits from the Energy Market Regulatory Authority (EPDK). They also have to organise their facilities according to the "TS 13541" standards. Base oil production must be done according to the "TS 13369" standards. All refineries are obliged to have an in-house laboratory with "TS EN ISO/IEC 17025" accreditation to conduct tests to characterise base oils and waste oils.³³¹

Producer Responsibility

Within the scope of the producer responsibility system prescribed by law, lubricating oil manufacturers are required to establish a system to collect waste lubricants from all over the country and operate this system effectively. The term extended producer responsibility first entered into legislation in 2015³³².

PETDER (Turkish Oil Industry Association) was the only authorised institution responsible for the collection, transportation, regeneration and disposal of waste lubricants. PETDER consists of 17 leading petroleum manufacturing companies operating in Turkey.³³³ As of 2021, 40 companies³³⁴ have signed a protocol with PETDER to join the waste lubricant oil collection organisation.³³⁵ However, after the amendment in 2020³³⁶, every refinery with a special permit from the government can collect and process waste oils. Lubricant distributors and importers are obliged to contribute or be a member of a consortium that collects waste oils.³³⁷

At the pre-treatment and regeneration facilities, samples are taken from waste oils to analyse PCB and chlorine content³³⁸.

After the collection, the waste oils are dealt in accordance with the results of these sample analyses:

1. Waste oils with less than 20ppm PCB and less than 1% chlorine content are sent to regeneration to produce base oils,

³³⁰ PETDER, Hakkımızda, 21.04.2022, <https://www.petder.org.tr/tr-TR/hakkimizda/627752>

³³¹ PETDER, Üye Şirketler, 21.04.2022, <https://www.petder.org.tr/tr-TR/uye-sirketler/627757>

³³² When the "Regulation on Waste Management" came into force after it was published in the Official Gazette on April 2, 2015. It is both referred as "Genişletilmiş Üretici Sorumluluğu (Extended Producer Responsibility)" or just "Üretici Sorumluluğu (Producer Responsibility)".

³³³ Official Gazette of the Republic of Turkey, Amendment to the Waste Oil Management Regulation, 23.12.2020, issue: 31343, article 2

³³⁴ Names of these companies can be found in the links at the references section.

³³⁵ Interview conducted on the 26/04/2022 with the representative of TAYRAŞ and GEIR

³³⁶ On December 23. Official Gazette of the Republic of Turkey, Waste Oil Management Regulation, 21.12.2019, issue: 30985, article: 9

³³⁷ Official Gazette of the Republic of Turkey, Amendment to the Waste Oil Management Regulation, 23.12.2020, issue: 31343, article 5

³³⁸ In accordance with the TS 900-1 EN ISO 3170 standards and analysed for PCB in accordance to TS EN 12766-1, TS EN 12766-2 and for chlorine in accordance to TS ISO 15597 standards.

2. Waste oils with between 20ppm and 50ppm PCB and less than 1% chlorine content are sent to co-incineration facilities for energy recovery,
3. Waste oils with more than 50ppm PCB and more than 1% chlorine content are sent to hazardous waste incineration facilities for disposal.³³⁹

PETDER does not collect any fees while offering waste collection services. However, private regeneration companies pay for the used oil to regenerate it for sale. Prices depend on the oil prices and the logistic costs.³⁴⁰

Waste Oil Collection and Recovery Statistics

According to the 2020 annual activity report of PETDER, the total amount of mineral oil consumed in Turkey was 470,010 tonnes.

In 2020, the amount of lubricant oils placed to the market was calculated to be 235,000 tonnes. Around 60% of this amount, which is around 141,000 tonnes, was estimated to become waste lubricant oils. The amount of registered and collected waste lubricant oils is around 19,469 tonnes which is around 14% of the total amount.

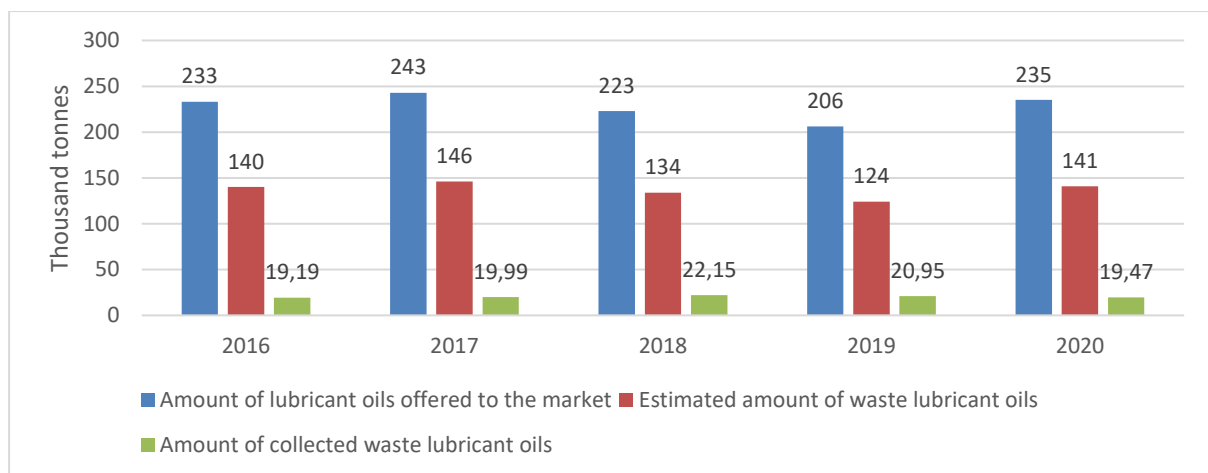


Figure 19: Comparison of the estimated and collected amounts of waste lubricant oils (per thousand tonnes), 2016-2020.

The remaining 121,531 tonnes of waste lubricant oils are neither registered nor collected, thus it is possible that these waste oils are used in illegal activities such as the production of non-standard oil products such as "Oil no 10".³⁴¹ "Oil no 10" is a non-standard fuel mix illegally manufactured using waste oils, mineral oils and base oils. Due to their high flammability, they represent a major threat to human health and environment. They are reported to be preferred by bus and truck drivers as they cost less than diesel fuel.³⁴²

The amendment made to the 2019 Regulation on Management of Waste Oil on December 23, 2020 allowed private refineries to collect and regenerate waste oils, thus it led to an increase in the amount of legally collected waste oils. For example, in 2022, TAYRAŞ alone

³³⁹ Official Gazette of the Republic of Turkey, Waste Oil Management Regulation, 21.12.2019, issue: 30985, article: 11

³⁴⁰ PETDER, 2020 Annual Activity Report, October 2021, page: 14

³⁴¹ T.C. Mevzuat Sistemi, Atıkların Karayolunda Taşınmasına İlişkin Tebliğ, 29.04.2022: <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=20617&MevzuatTur=9&MevzuatTertip=5>

³⁴² Interview conducted on the 26/04/2022 with the representative of TAYRAŞ and GEIR

is collecting 30,000 tonnes of waste lubricants. TAYRAŞ is a Turkish firm that has a waste oil processing refinery in Bilecik and it is the only firm that represents Turkey in GEIR³⁴³.

The information regarding the amount of waste oils that are regenerated, used as supplemental fuel, or disposed of are available only for the years 2005-2010.

Table 32. Amount of waste oils recovered, used as supplemental fuel or disposed of, 2005-2010.

Year	Regenerated (t)	Supplemental fuel (t) Cement factories, plaster factories, lime factories, ceramic drying ovens, iron-steel blast furnaces and power plants	Disposed of (t) Hazardous waste incineration
2005	3,782	4,717	2,938
2006	15,485	7,296	2,950
2007	21,318	11,756	3,356
2008	18,155	13,190	2,887
2009	28,113	13,667	2,668
2010	28,140	14,575	1,244

The information about the amounts of resulting products obtained from waste oil regeneration is only available for the years 2006-2009.

Table 33. Resulting products from waste oil regeneration, 2006-2009.³⁴⁴

Year	Amount of Product (t)(Moulding Oil+Blending Oil+Jute Oil)
2006	6,871
2007	11,010
2008	10,442
2009	16,490

Efforts to increase the collection rates

As a part of the waste oil management project led by PETDER, waste oil producers are regularly visited to raise awareness; cooperation protocols are signed with local government institutions, and meeting and training programs are organised to draw attention to the negative impacts of waste lubricant oils to the environment and human health and to ensure the contribution of waste oil producers to the project. Information

³⁴³ Groupement Européen de l'Industrie de la Régénération.

³⁴⁴ Republic of Turkey Ministry of Science, Industry and Technology, National Recycling Strategy Document and Action Plan 2014-2017, page 42-43

about the efforts of the project is provided at fairs and other activities through print and visual media.³⁴⁵Detailed information about such activities can be found in the annual activity reports of PETDER.

The 2020 amendment was a very important step towards increasing the legal collection rates and reducing the importance of the black markets where oil no 10 are produced and sold. These figures referring what happened to collected waste oil was only available in the National Recycling Strategy Document. However, information about the total amount of waste oil collected by PETDER is available in the annual activity reports. It's just that the statistics of exactly how much of the collected waste oil is re-used or disposed is not available anymore.

Challenges and success factors regarding the waste oil management

Since the entry into force of the first legislative framework on the management of waste oils, numerous regulation and standards were introduced. However, more time and effort are necessary for the proper implementation of the legislation. A part of the market is still in the grey zone and outside of the official regulation. Some small businesses and repair shops do not have tax numbers and they do not charge VAT. These small businesses and repair shops have to be incentivised to join the MoTAT system and be a part of the official process.

However, the new legislation is resulting in improvements and awareness is increasing. At the end of 2022, it is expected that more waste oil will be collected and recycled in accordance with the official regulations rather than illegally used in the production of oil no 10. Thanks to the implementation of the MoTAT system and increasing controls and audits, the grey zone in the industry is shrinking and the amount of waste oils that are dealt according to the official regulations are increasing.³⁴⁶

Turkey bibliography

Sources

Interview conducted on the 26/04/2022 with the representative of TAYRAŞ and GEIR.

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Official Gazette of the Republic of Turkey, Amendment to the Waste Oil Management Regulation, 23.12.2020: <https://www.resmigazete.gov.tr/eskiler/2020/12/20201223-14.htm>

Official Gazette of the Republic of Turkey, Waste Management Regulation, 02.04.2015: <https://www.resmigazete.gov.tr/eskiler/2015/04/20150402-2.htm>

PETDER, 2020 Annual Activity Report: <https://www.petder.org.tr/Uploads/Document/d875be36-586f-404c-9864-ea6036e67314.pdf?v-637704103004899103>

³⁴⁵ PETDER, 2020 Annual Activity Report, October 2021, pages: 33, 34






³⁴⁶ Interview conducted on the 26/04/2022 with the representative of TAYRAŞ and GEIR

Republic of Turkey Ministry of Science, Industry and Technology, National Recycling Strategy Document and Action Plan 2014-2017: <https://www.resmigazete.gov.tr/eskiler/2014/12/20141230M1-12-1.pdf>

Further Reading

Republic of Turkey Ministry of Environment and Urbanization, National Waste Management and Action Plan 2023: https://webdosya.csb.gov.tr/db/cygm/haberler/ulusal_at-k_yonetim--eylem_plan--20180328154824.pdf

8.4. Stakeholder questionnaires

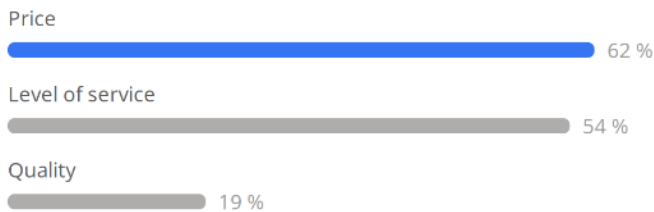
Stakeholder	Questionnaire
ATIEL	
Concawe and Fuels Europe	
FEAD	
GEIR	
Hazardous Waste Europe	

8.5. Workshop detail (summary of SliDo inputs)

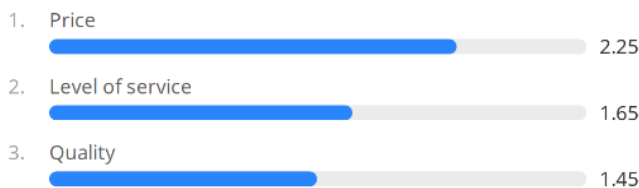
8.5.1. Problem definition – Causes of waste oils collection and regeneration problems

Collection problems: price as the biggest issue

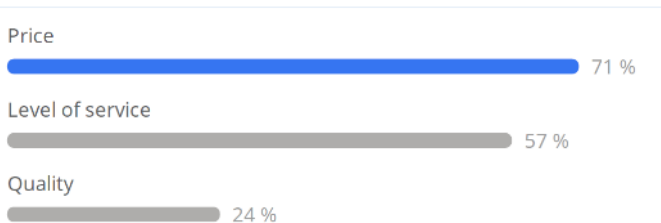
Group 1:



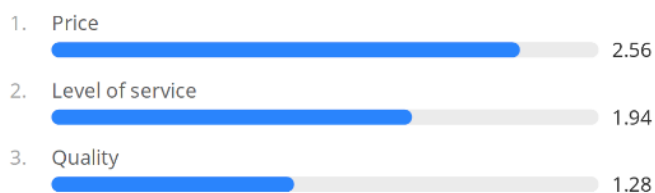
- Price charged for collection and level of service are both a problem for producers of small volumes in remote areas
- Finnish voluntary agreement works well with high oil prices but not so much when prices are low



Group 2:

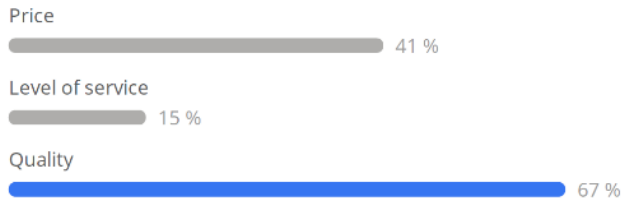


- Solution for the price issue: free of charge collection, easy access
- Difference for professionals and private waste oil holders: DIY much more difficult
- Distribution of waste oil over the country presents another problem (distance but also time due to traffic jams for small quantities)

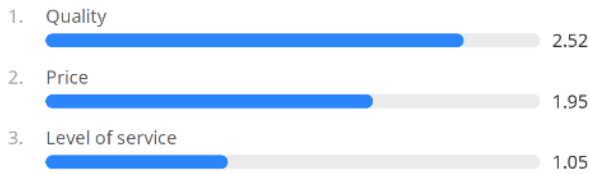


Regeneration problems: quality as the biggest issue

Group 1:

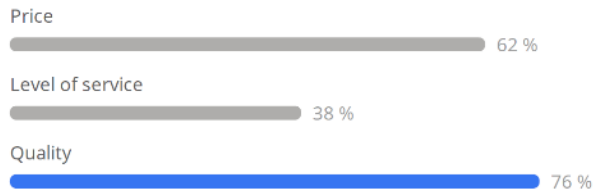


- Link between price and quality of oil. The lower the quality the lower the price
- PCBs, Chlorides, Sulphur and FAME (fatty acid methyl ester) are a challenge and oils used for metal working (water content and other contamination)
- Not a fixed price, based on quality

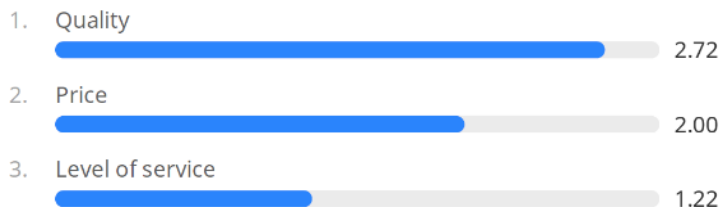


- The poll misses the enforcement part (do waste holders know the rules and do they follow)
- Correlation of quality and price difficult as this is not known when collected but only when received
- Successful collection schemes like those in Italy should be looked upon in more detail

Group 2:



- The lack of enforcement of the regulation is another cause of the low quality of the collected waste oil, Art. 21 (mixing ban) should be enforced



8.5.2. Policy measures – Increasing the quantity and the quality of waste oil treated

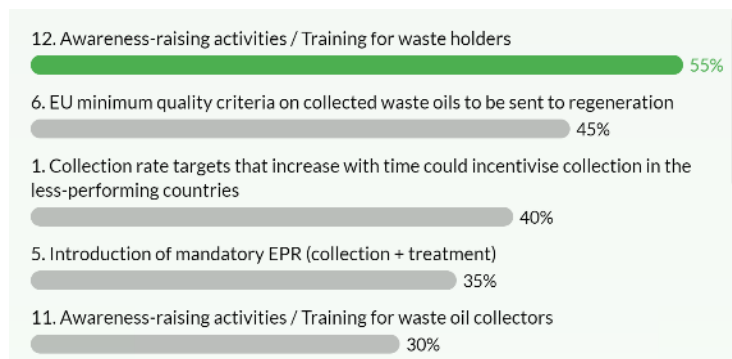
List of the policy measures

Final Report

- Collection rate targets that increase with time could incentivise collection in the less-performing countries
- Deposit refund schemes that provide an incentive for countries with low collection rates (e.g. as recently adopted in Poland)
- Subsidy per litre of collected WO
- Reinforcement of polluter pays principle
- Introduction of mandatory EPR (collection + treatment)
- EU minimum quality criteria on collected waste oils to be sent to regeneration
- EU promotion of cooperation between collectors and regeneration in view of setting minimum quality criteria
- Introduce specific criteria to license collectors for waste oil collection
- Mandatory collection practices by waste collectors
- Mandatory quality control by waste collectors
- Awareness-raising activities / Training for waste oil collectors
- Awareness-raising activities / Training for waste holders

Higher quantity:

Group 1:



- Better enforcement as well as more resources to authorities in charge of collection needed
- Quality criteria: treatment of waste oil is important, i.e., training for waste holders, regarding management of waste oil (mixing)
-

Group 2:

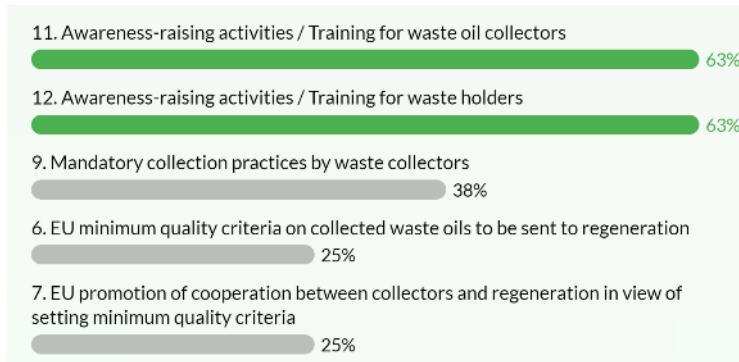


- EPR is not enough:
 - need incentives for collectors to extract the less profitable %: Financial support yes (\neq subsidy), license rules so that collectors have to cover a geographical zone for example (also the waste holders with a small quantity and a long transport distance)

- careful to make sure that there remains market competition especially where market works well already
- In countries where the value chain works well, awareness raising could help
- Deposit schemes: traceability is key, calculation, some views (not necessary if collection is for free)

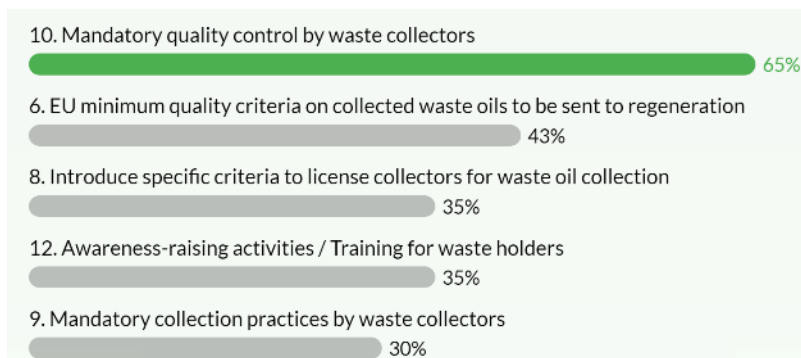
Higher Quality

Group 1:



- Certificate for waste collectors: set a bar/criteria for how to do this to increase quality
- Incentivise via price to not mix, difficulty here: market drives price
- Common quality criteria for waste oil should be developed
- Refund scheme for small countries can be difficult, as a lot of their waste oil comes from other countries (i.e. how would EPR fees collected in one country reach those treating the waste in another Member State?)
- Increasing local authorities: enforcement and monitoring

Group 2:



- Better enforcement of the mixing ban (controls)
 - The value chain could control the mixing to identify the problem (mixing is ok if regeneration is still possible)
- Mandatory control could help identify problems + can be used to charge the waste holder but indirect impact only
- Need clearer rules about what can be mixed and not mixed and how storage can be organised
- Dialogue in the value chain is key
- Risk that standards for regeneration lead to mixtures being sent to incineration
- Improvement of regeneration technologies will also help (out of scope)

8.5.3. General comments from participants

- There are big differences between Member States and it is difficult to find a solution for everybody.
- Lack of control by public authorities is a general problem.
- The collection will take place if the collector has an economic benefit
- Free of charge collection reduces the environmental risk of mismanaged waste oils.
- Illegal disposal of waste oils (e.g. burning of oil in small boilers for heating) is still an issue in some Member States.
- Some Member States developed a methodology to estimate the collectible waste oils based on the lubricants that are put on the market. These estimations are country specific as the pattern and intensity of use of lubricants differs.

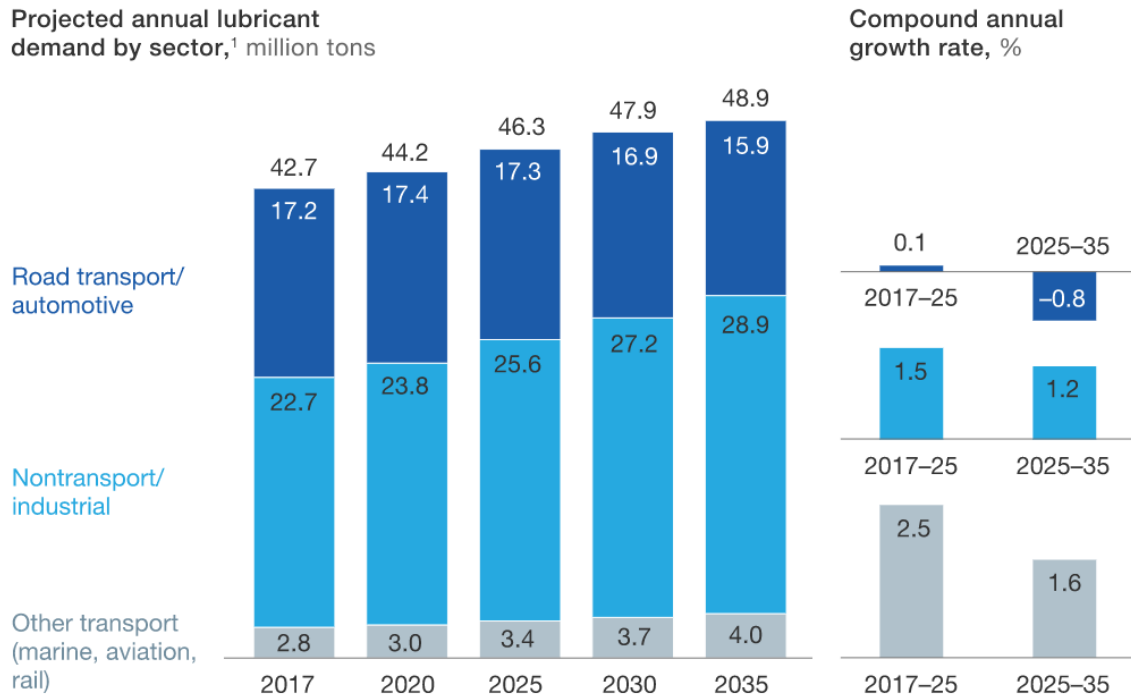
8.5.4. Good practices

4 Member States presented good practises during the workshop:

- EPR system with high collection and regeneration rates: Belgium (2020)
 - Collection rate (Collected/collectible) around 100 %
 - Regeneration rate: around 90 %
- Market based waste oil with collection and regeneration rate: Germany (2018)
 - Collection rate (collected/put on the market): 42 %
 - Regeneration rate: 89 %
- Ambitious targets or foreseen targets for new EPR/EPR modifications
 - France
 - Collection (collected/put on the market): 50% (2023), 53% (2025), 55% (2027)
 - Regeneration: 75% (2023), 83% (2025), 90% (2027)

Poland: gradual increase in recovery and recycling targets

8.6. Data sources for baseline estimates



¹Figures may not sum, because of rounding.

Figure 20 : McKinsey & Company forecast for lubricant demand growth³⁴⁷

³⁴⁷ McKinsey & Company (2018). « Lubes growth opportunities remain despite switch to electric vehicles ». Link : [Lubricating oil growth opportunities to 2035 | McKinsey](#)

8.7. Collection cost model

Collection cost englobes:

- > Transport cost from
 - collection rounds (transport from collection points to the intermediate storage facility)
 - intermediate storage facility to treatment facility
- > Storage facility
- > Analysis and quality control

8.7.1. Transport cost for collected waste oil

There are two transport phases, each entailing different costs:

- > Transport from collection points to the intermediate storage facility (smaller capacity trucks and variable fill rates)
- > Transport from the intermediate storage facility (bigger capacity truck and maximised fill rates)

This section presents the theoretical collection cost model for waste oil transport.

Waste oil's collection cost (**C**) can be defined as a function of:

- > **truck cost** per driving **hour (Tch)**;
- > truck **driving** use in hours per day (**D**);
- > **truck cost** per **loading** & unloading hour (**Tcl**);
- > **loading** hours per day (**L**);
- > **unloading** hours per day (**U**);
- > **quantity** of collected waste oil per truck per day (**Q**).

The following function is used to estimate the transport cost from **collection points to the intermediate storage facility**. The function is given by the following equation:

$$C = \frac{Tch * D + Tcl * (L + U)}{Q}$$

Equation 1 : waste oil collection cost based on driving and loading/unloading hours

Collection cost (**C**) can also be defined as a function of:

- > **truck cost** per driven kilometre (**Tck**);
- > truck **driving** use in kilometres per day (**K**);
- > **truck cost** per **loading** & unloading hour (**Tcl**);
- > **loading** hours per day (**L**);
- > **unloading** hours per day (**U**);
- > **quantity** of collected waste oil per truck per day (**Q**).

This approach is used to estimate transport cost from **collection points to the intermediate storage facility** since interview data enabled us to deduce truck use in terms of time (for driving, loading and unloading) and not in terms of km.

The following function is used to estimate the transport cost from the **intermediate storage facility to the treatment centre**. The function is given by the following equation:

$$C = \frac{TcK * K + Tcl * (L + U)}{Q}$$

Equation 2 : waste oil collection cost based on driven kilometres

This approach is used to estimate transport cost from **intermediate storage facility to the treatment centre** since results presented in section 0 on waste oil management facilities in the UE (cf. Figure 3) enabled us to deduce an average distance in km between these two points.

Variables of **Equation 1** and **Equation 2** can be further detailed.

8.7.1.1. Truck cost per driving hour or driving kilometre

Truck cost per driving hour englobes the following components.

- > Fixed costs: depreciations of capital assets, vehicle excise duty, Eurovignet, interest on capital assets, insurance costs.
- > Variable costs: fuel, bunkering, stores and supplies, maintenance, and repairs.
- > Staff costs: wages, social security and pension contributions.
- > Mode-specific costs: usage of infrastructure, supporting services, permits and certification.
- > General operating costs: administration, real estate and infrastructure, wages including social charges for other personnel, IT and communications, overhead.

Cost per hour is estimated by dividing the annual total cost with respect to the number of the trucks yearly operating hours or yearly driven kilometres. Truck cost per hour or kilometre is significantly variable depending on the EU Member state; this is due mainly because of staff cost variation.

8.7.1.2. Truck driving use in hours per day

Truck use hours per day is a function of

- > Distance (between collection points, the storage facility, or the treatment facility);
- > Truck's speed.
- > Truck use hours per day cannot be greater than the workable hours per day minus loading and unloading hours per day.

8.7.1.3. Truck cost per loading & unloading hour

Truck cost per loading & unloading hour englobes the same components as the trucks driving cost per hour (cf. page 269) minus the variable costs. That is, the following components.

- > Fixed costs: depreciations of capital assets, vehicle excise duty, Eurovignet, interest on capital assets, insurance costs.
- > Staff costs: wages, social security and pension contributions.
- > Mode-specific costs: usage of infrastructure, supporting services, permits and certification.
- > General operating costs: administration, real estate and infrastructure, wages including social charges for other personnel, IT and communications, overhead.

8.7.1.4. Loading and unloading hours

Waste oil collection requires time for the operator to load and unload waste oil.

Loading time is a function of

- > time needed for collection
- > quantity of waste oil collected per day.

Unloading time is a function of

- > number of unloads per truck per day
- > quantity of waste oil that is unloaded each time.

8.7.1.5. Quantity of collected waste oil per truck per day

Quantity of collected waste oil is a function of

- > number of collection points per truck per day;

- > average quantity of collected waste oil per collection point.

8.7.2. Storage facility

The storage facility cost encompasses costs arising from the infrastructure, operations and staff needed for the intermediate storage and bulking of waste oil. From the facility, waste oils are sent to the different treatment facilities.

8.7.3. Analysis and quality control

Analysis and quality control costs arise from the chemical tests and laboratory services. The cost per tonne depends on size of the waste oil batch that is analysed. The smaller the batch the higher the cost per tonne.

8.7.4. Data sources and estimation approaches

Variables	Unit	Components	Data source & estimation approaches
Truck driving cost	€/hour & €/km	Fixed costs	Direct data from "Panteia (2020). Cost Figures for Freight Transport" adjusted for inflation. The same value was used for all MS.
		Variable costs	
		General operating costs	
		Mode-specific costs	
		Staff costs	Direct data from "Panteia (2020). Cost Figures for Freight Transport" adjusted for inflation. Staff costs was estimated by "Cross-multiplication" for each MS using EUROSTAT data for hourly wages per country.
Truck driving use	hours/day	-	Deduced by subtracting unloading and loading time from legal working hours per day.
		-	
Truck unloading & loading cost	€/hour	Fixed costs	Direct data from "Panteia (2020). Cost Figures for Freight Transport" adjusted for inflation. The same value was used for all MS.
		General operating costs	
		Mode-specific costs	
		Staff costs	Direct data from "Panteia (2020). Cost Figures for Freight Transport" adjusted for inflation. Staff costs was estimated by "Cross-multiplication" for each MS using EUROSTAT data for hourly wages per country.

Final Report

Variables	Unit	Components	Data source & estimation approaches
Loading hours	hours/day	-	Interviews
		-	
Unloading hours	hours/day		Computations based on discussions with stakeholders
		Number of unloads per truck per day	Interviews and extrapolation exercise base on populations density
Collected waste oil per truck	t/day	Average quantity of collected waste oil per collection point	Interviews and extrapolation exercise base on populations density*
Storage facility cost	€/t	-	Interviews and extrapolation exercise based on EUROSTAT data for hourly wages per country.
Analysis cost	€	-	Computation based on interviews and online research.

*Population density was used since it could reflect two major components of collected quantity per day: distance between collections points and quantities of waste oil per collection point. However, some MS like Finland present a national population density that is very low since the countries surface is relatively large and population relatively low; nevertheless, this does not consider population concentration in major cities. We thus recalculated population density considering only NUTS with a population density higher than 50 inhabitants per km².

8.7.5. Estimates for cost parameters per MS

The following two tables show truck cost per km and per hour based on data from "Panteia (2020). Cost Figures for Freight Transport" corrected for inflation and staff cost were extrapolated using EUROSTAT hourly wages per MS.

Table 34 : truck cost per km (in €/km)

	Fixed costs*	Variable costs**	Staff costs***	Mode-specific costs****	General costs***** operating	Total costs per km
Austria	0.36	1.18	0.92	0.01	0.24	2.72
Belgium	0.36	1.18	0.98	0.01	0.24	2.78
Bulgaria	0.36	1.18	0.17	0.01	0.24	1.97
Croatia	0.36	1.18	0.25	0.01	0.24	2.05
Cyprus	0.36	1.18	0.56	0.01	0.24	2.35
Czechia	0.36	1.18	0.36	0.01	0.24	2.16
Denmark	0.36	1.18	1.19	0.01	0.24	2.99
Estonia	0.36	1.18	0.38	0.01	0.24	2.17
Finland	0.36	1.18	0.89	0.01	0.24	2.69
France	0.36	1.18	0.90	0.01	0.24	2.70
Germany	0.36	1.18	0.78	0.01	0.24	2.58
Greece	0.36	1.18	0.77	0.01	0.24	2.57
Hungary	0.36	1.18	0.27	0.01	0.24	2.07

Final Report

	Fixed costs*	Variable costs**	Staff costs***	Mode-specific costs****	General operating costs*****	Total costs per km
Ireland	0.36	1.18	0.73	0.01	0.24	2.53
Italy	0.36	1.18	0.70	0.01	0.24	2.49
Latvia	0.36	1.18	0.28	0.01	0.24	2.08
Lithuania	0.36	1.18	0.28	0.01	0.24	2.08
Luxembourg	0.36	1.18	1.05	0.01	0.24	2.85
Malta	0.36	1.18	0.43	0.01	0.24	2.23
Netherlands	0.36	1.18	0.93	0.01	0.24	2.73
Poland	0.36	1.18	0.25	0.01	0.24	2.05
Portugal	0.36	1.18	0.56	0.01	0.24	2.35
Romania	0.36	1.18	0.21	0.01	0.24	2.01
Slovakia	0.36	1.18	0.32	0.01	0.24	2.11
Slovenia	0.36	1.18	0.48	0.01	0.24	2.28
Spain	0.36	1.18	0.60	0.01	0.24	2.40
Sweden	0.36	1.18	0.92	0.01	0.24	2.72

Table 35 : truck cost per hour (in €/h)

	Fixed costs*	Variable costs**	Staff costs***	Mode-specific costs****	General costs*****	operating	Total costs per hour
Austria	14.65	48.40	37.96	0.39	9.86		111.27
Belgium	14.65	48.40	40.29	0.39	9.86		113.60
Bulgaria	14.65	48.40	6.88	0.39	9.86		80.19
Croatia	14.65	48.40	10.43	0.39	9.86		83.74
Cyprus	14.65	48.40	22.87	0.39	9.86		96.17
Czechia	14.65	48.40	14.99	0.39	9.86		88.29
Denmark	14.65	48.40	49.06	0.39	9.86		122.37
Estonia	14.65	48.40	15.43	0.39	9.86		88.73
Finland	14.65	48.40	36.52	0.39	9.86		109.82
France	14.65	48.40	37.19	0.39	9.86		110.49
Germany	14.65	48.40	32.19	0.39	9.86		105.50
Greece	14.65	48.40	31.86	0.39	9.86		105.16
Hungary	14.65	48.40	10.99	0.39	9.86		84.29
Ireland	14.65	48.40	30.19	0.39	9.86		103.50
Italy	14.65	48.40	28.64	0.39	9.86		101.94

Final Report

	Fixed costs*	Variable costs**	Staff costs***	Mode-specific costs****	General operating costs*****	Total costs per hour
Latvia	14.65	48.40	11.54	0.39	9.86	84.85
Lithuania	14.65	48.40	11.66	0.39	9.86	84.96
Luxembourg	14.65	48.40	43.29	0.39	9.86	116.60
Malta	14.65	48.40	17.87	0.39	9.86	91.18
Netherlands	14.65	48.40	38.41	0.39	9.86	111.71
Poland	14.65	48.40	10.43	0.39	9.86	83.74
Portugal	14.65	48.40	22.87	0.39	9.86	96.17
Romania	14.65	48.40	8.77	0.39	9.86	82.07
Slovakia	14.65	48.40	12.99	0.39	9.86	86.29
Slovenia	14.65	48.40	19.76	0.39	9.86	93.06
Spain	14.65	48.40	24.64	0.39	9.86	97.95
Sweden	14.65	48.40	37.85	0.39	9.86	111.16

*Fixed costs: asset depreciations or asset leases, insurance, interest, maintenance and repairs

**Variable costs: fuel/energy, bunkering, stores and supplies, maintenance and repairs

***Staff costs: wages and social security and pension contributions

****Mode-specific costs: usage of infrastructure, supporting services, permits and certification

*****General operating costs: administration, real estate and infrastructure, wages including social charges for other personnel, IT and communications, overhead

Table 36 : parameters used to estimate transport from collection points to intermediate storage facility.

Variable	Truck cost per driving hour	Truck driving use	Distance per day per truck	Truck cost per loading & unloading hour	Loading hours per day	Unloading hours per day	Quantity of collected waste oil per truck per day
Unit	€/h	h/day	km/day	€/h	h/day	h/day	t/day
Belgium	114	2	70	65	6	0.3	20
Bulgaria	80	6	221	32	2	0.3	5
Czechia	88	5	183	40	3	0.3	7
Denmark	122	5	183	74	3	0.3	7
Germany	105	2	79	57	6	0.3	13
Estonia	89	4	177	40	3	0.3	7
Ireland	103	5	194	55	3	0.3	6
Greece	105	4	167	57	4	0.3	8
Spain	98	4	142	50	4	0.3	9
France	110	3	138	62	4	0.3	9
Croatia	84	5	209	35	3	0.3	5
Italy	102	3	118	54	5	0.3	10
Cyprus	96	5	219	48	2	0.3	5

Final Report

Latvia	85	2	70	36	6	0.3	27
Lithuania	85	6	240	37	2	0.3	4
Luxembourg	117	2	80	68	6	0.3	12
Hungary	84	5	208	36	3	0.3	6
Malta	91	2	70	43	6	0.3	27
Netherlands	112	2	70	63	6	0.3	26
Austria	111	4	162	63	4	0.3	8
Poland	84	5	187	35	3	0.3	7
Portugal	96	3	138	48	4	0.3	9
Romania	82	6	229	34	2	0.3	4
Slovenia	93	5	208	45	3	0.3	6
Slovakia	86	5	206	38	3	0.3	6
Finland	110	4	143	61	4	0.3	9
Sweden	111	5	207	63	3	0.3	6

Table 37 : parameters used to estimate transport from intermediate storage facility to final treatment.

	Truck cost per km	Truck driving use	Truck cost per loading & unloading hour	Loading hours per day	Unloading hours per day	Quantity of collected waste oil per truck per day
Unit	€/km	km/day	€/h	h/day	h/day	t/day
Belgium	3	300	65	0.25	0.25	24
Bulgaria	2	300	32	0.25	0.25	24
Czechia	2	300	40	0.25	0.25	24
Denmark	3	300	74	0.25	0.25	24
Germany	3	300	57	0.25	0.25	24
Estonia	2	300	40	0.25	0.25	24
Ireland	3	300	55	0.25	0.25	24
Greece	3	300	57	0.25	0.25	24
Spain	2	300	50	0.25	0.25	24
France	3	300	62	0.25	0.25	24
Croatia	2	300	35	0.25	0.25	24
Italy	2	300	54	0.25	0.25	24
Cyprus	2	300	48	0.25	0.25	24
Latvia	2	300	36	0.25	0.25	24

Final Report

	Truck cost per km	Truck driving use	Truck cost per loading & unloading hour	Loading hours per day	Unloading hours per day	Quantity of collected waste oil per truck per day
Unit	€/km	km/day	€/h	h/day	h/day	t/day
Lithuania	2	300	37	0.25	0.25	24
Luxembourg	3	300	68	0.25	0.25	24
Hungary	2	300	36	0.25	0.25	24
Malta	2	300	43	0.25	0.25	24
Netherlands	3	300	63	0.25	0.25	24
Austria	3	300	63	0.25	0.25	24
Poland	2	300	35	0.25	0.25	24
Portugal	2	300	48	0.25	0.25	24
Romania	2	300	34	0.25	0.25	24
Slovenia	2	300	45	0.25	0.25	24
Slovakia	2	300	38	0.25	0.25	24
Finland	3	300	61	0.25	0.25	24
Sweden	3	300	63	0.25	0.25	24

8.7.6. Collection cost estimates per country

The following table shows the total collection cost estimates per country.

Table 38: total collection cost estimates per country in €/t

	Transport - collection to intermediate storage facility	Analysis and quality control	Transport intermediate storage facility to treatment	Storage facility	Collection cost total
Sweden	135	4	35	26	200
Denmark	118	4	39	35	195
Lithuania	154	4	27	8	193
Cyprus	132	4	30	17	183
Ireland	107	4	33	23	167
Romania	124	4	26	6	160
Slovenia	110	4	29	14	157
Austria	87	4	35	28	154
Greece	84	4	33	22	143
Bulgaria	108	4	25	5	142
Finland	74	4	35	26	139
Slovakia	98	4	27	9	138
France	71	4	35	27	137
Hungary	98	4	27	8	136
Croatia	98	4	26	8	136
Luxembourg	51	4	37	31	123
Czechia	78	4	28	11	120
Portugal	59	14*	30	16	120
Estonia	75	4	28	11	118
Spain	62	4	31	19	116
Poland	76	4	26	7	114

	Transport - collection to intermediate storage facility	Analysis and quality control	Transport intermediate storage facility to treatment	Storage facility	Collection cost total
Italy	55	4	32	22	113
Germany	44	4	33	24	105
Belgium	30	4	36	29	99
Netherlands	23	4	35	28	91
Malta	16	4	29	13	61
Latvia	14	4	27	8	53

*Portugal carries out control analyses for each truck, this amount comes from interviews with Portuguese collectors.

8.7.7. Population density correction

Table 39 : population density used for the extrapolation of quantity of collected waste oil per truck per day for each country (in inhab./km²)

Country	Population density	Corrected population (excluding NUTS 3 with a population density < 50 inhab./km²)
Austria	108	158
Belgium	377	407
Bulgaria	63	95
Croatia	73	108
Cyprus	96	97
Czechia	138	136
Denmark	139	136
Estonia	31	142
Finland	18	178
France	106	156
Greece	82	153
Hungary	107	108
Ireland	72	124

Country	Population density	Corrected population (excluding NUTS 3 with a population density < 50 inhab./km²)
Italy	202	205
Latvia	30	2022
Lithuania	45	75
Luxembourg	240	245
Malta	1595	1636
Netherlands	507	507
Poland	124	131
Portugal	113	221
Romania	83	87
Slovakia	112	111
Slovenia	104	109
Spain	94	179
Sweden	25	110
Germany	235	247

8.8. Data for collection targets impact assessment

Reminder, **two target levels are proposed**:

- by 2030, the collection of waste oil should be increased to a minimum of 80 % by weight, based on generated waste oil quantities, in all MS with a current collection rate below 80 %. Those MS should also meet the target of the high-performing MS in 2035 or 2040: a collection rate of 95 % (see next bullet point). This would lead to a catching up mechanism.
- by 2030, the collection of waste oil should be increased to a minimum of 95 % by weight, based on generated waste oil quantities, in all MS with a current collection rate between 80 and 95 %.

Table 40 : data used to compute total gross collection cost and additional jobs generated by the measure by MS

MS	Collection cost baseline	Collection cost to reach targets	Current collection rate	Collection rate target	Collection rate increase needed to reach target
	€/t	€/t	%		%
Austria	154	154	95%	Already at target	0%
Belgium	99	99	99%	Already at target	0%
Bulgaria	142	135	63%	80%	17%
Croatia	136	140	93%	95%	2%
Cyprus	183	183	100%	Already at target	0%
Czechia	120	120	98%	Already at target	0%
Denmark	195	193	70%	80%	10%
Estonia	118	111	57%	80%	23%
Finland	139	141	79%	80%	1%
France	137	137	73%	80%	7%
Germany	105	105	100%	Already at target	0%
Greece	143	141	83%	95%	12%
Hungary	136	121	48%	80%	32%
Ireland	167	167	100%	Already at target	0%
Italy	113	113	100%	Already at target	0%

MS	Collecti on cost baselin e	Collection cost to reach targets	Current collection rate	Collection rate target	Collection rate increase needed to reach target
	€/t	€/t	%		%
Latvia	53	53	100%	Already at target	0%
Lithuania	193	187	83%	95%	12%
Luxembourg	123	123	100%	Already at target	0%
Malta	61	61	100%	Already at target	0%
Netherlands	91	89	87%	95%	8%
Poland	114	114	73%	80%	7%
Portugal	120	120	96%	Already at target	0%
Romania	160	134	38%	80%	42%
Slovakia	138	129	58%	80%	22%
Slovenia	157	157	100%	Already at target	0%
Spain	116	114	82%		13%
Sweden	200	202	89%		6%

The following table shows the additional collected quantity based on collection targets (80 % or 95 %). Targets per MS are shown in **Table 40**.

Table 41: additional collected quantity based on collection targets

MS	Additional tonnage to be collected annually to reach the 2030 target (compared to the current situation)	Additional annual collection cost to reach the 2030 target (compared to the current situation)
Unit	t/year	€/year
Austria	-	-
Belgium	-	-
Bulgaria	2 791	376 576
Croatia	311	43 676
Cyprus	-	-

MS	Additional tonnage to be collected annually to reach the 2030 target (compared to the current situation)	Additional annual collection cost to reach the 2030 target (compared to the current situation)
Unit	t/year	€/year
Czechia	-	-
Denmark	2 807	542 868
Estonia	835	92 399
Finland	288	40 714
France	19 935	2 731 916
Germany	-	-
Greece	3 589	506 196
Hungary	8 274	1 002 960
Ireland	-	-
Italy	-	-
Latvia	-	-
Lithuania	748	140 130
Luxembourg	-	-
Malta	-	-
Netherlands	4 946	442 379
Poland	8 926	1 018 660
Portugal	-	-
Romania	34 295	4 580 215
Slovakia	2 746	352 973
Slovenia	-	-
Spain	26 764	3 047 801
Sweden	2 789	562 755

Table 42 : FTE per kt of collected waste oil

MS	FTE per kt of collected oil*
Austria	0.6
Belgium	0.2
Bulgaria	0.8
Croatia	0.8
Cyprus	0.9
Czechia	0.7
Denmark	0.6
Estonia	0.5
Finland	0.5
France	0.5
Germany	0.4
Greece	0.5
Hungary	0.6
Ireland	0.7
Italy	0.4
Latvia	0.2
Lithuania	1.1
Luxembourg	0.4
Malta	0.2
Netherlands	0.2
Poland	0.6
Portugal	0.5
Romania	0.7
Slovakia	0.7

Final Report

MS	FTE per kt of collected oil*
Slovenia	0.8
Spain	0.4
Sweden	0.8

*The difference between MS is explained by the difference of average collected quantities per truck per day. When collection is more efficient (higher quantities collected per day per truck), less work is needed to collect the same quantity of waste oil.

Table 43 : EPR administrative cost in € per MS

MS	EPR administrative cost € per MS* and per year
MS that do not have an EPR system and are not compliant with targets	
Bulgaria	160 000
Denmark	310 000
Estonia	30 000
Finland	360 000
Hungary	190 000
Lithuania	80 000
Netherlands	840 000
Poland	1 460 000
MS with an EPR used to compute the average EPR administrative cost per collected waste oils	
Belgium	280 000
Greece	300 000
Italy	3 500 000
Portugal	1 000 000
Spain	1 100 000

*The EPR administrative cost is estimated based on the Average administrative cost of 5 EPR (Belgium, Greece, Italy, Portugal, and Spain). Administrative costs for these EPR come from LE BIHAN Mathilde, DULBECCO José Rafael, MARTIN Sarah, MICHEL Frédéric, RDC Environment, ADEME. 2021. European review of extended producer responsibility (EPR) schemes for lubricants. EPR costs of country for which data is not available were extrapolated based on current waste oil collection.

8.9. Statistics on quantities placed on the market per waste oil category

Figures on PoM are not fully reliable in every case. Countries with not available data were excluded from the analysis, these are CZ, EL, IT, CY, LV, MT, PL, RO.

Based on the cross-check performed performed with Oeko-Institute³⁴⁸ available data for period 2016-2018 from DE, PL, BE, FR, PT, IT, FR on the category of PoM waste oils (engine and gear box, industrial, industrial emulsions only, concentrates) some data were considered very reliable. A high reliability of the data was based on the close similarity of the values between the MS reporting data provided by Eurostat (corresponding to the year 2020) and the data available for the period 2016-2018 contained in Oeko-Institute Report³⁴⁹. These are highlighted in green below.

Table 44 Share of placed on the market - oil type per category

Country	ENG %	IND %	EMUL %
BE	97%	0%	3%
BG	71%	7%	22%
DK	74%	4%	23%
DE	60%	36%	5%
EE	46%	52%	1%
IE	65%	35%	0%
ES	56%	41%	3%
FR	70%	30%	0%
HR	44%	56%	0%
LT	70%	30%	0%
LU	22%	78%	0%
HU	100%	0%	0%
NL	100%	0%	0%
AT	54%	36%	10%
PT	69%	31%	0%
SI	18%	70%	12%
SK	31%	6%	63%
FI	21%	77%	2%
SE	23%	77%	0%

ENG: engine

IND: industry

EMUL: emulsions

Based on the performed cross-check, reliable data are highlighted in green.

³⁴⁸ Oeko-Institut Study: Study to support the Commission in gathering structured information and defining of reporting obligations on waste oils and other hazardous waste, 2020, available at: <https://op.europa.eu/en/publication-detail/-/publication/73a728bc-72f5-11ea-a07e-01aa75ed71a1/language-en>.

³⁴⁹ Oeko-Institut Study: Study to support the Commission in gathering structured information and defining of reporting obligations on waste oils and other hazardous waste, 2020, available at: <https://op.europa.eu/en/publication-detail/-/publication/73a728bc-72f5-11ea-a07e-01aa75ed71a1/language-en>.

Source: MS Reporting (2020)

8.10. Statistics on type of treatment of waste oil per process

Table 45 :Type of treatment of waste oil per process – quantity (tonnes)

Country	REG-dry	RCY-dry	RCV_E-dry	DSP-dry	Total
DE	402.732	59.312	212.139	0	674.182
FR	110.556	9.157	71.731	0	191.444
ES	101.508	1.165	36.317	0	138.990
FI	56.531	0	932	2.158	59.621
HU	29.078	3.832	135	731	33.777
PT	18.373	4.449	7	408	23.237
DK	12.818	9.279	2.830	1.632	26.559
CZ	2.544	7.968	0	1.057	11.569
SK	2.365	880	1.701	1	4.948
HR	153	0	5.964	261	6.378
EE	16	0	3.271	1	3.288
LV	0	6.858	0	0	6.858
LT	0	665	2.095	0	2.760
AT	0	375	24.396	0	24.771
SE	0	0	54.733	0	54.733
IE	0	0	33.972	0	33.972
BE	0	0	3.304	0	3.304
NL	0	0	1.897	0	1.897

POM Placed on the market

COL Separately collected

REG Regeneration

RCY Other recycling

RCV_E Energy recovery

DSP Disposal

Source: MS Reporting (2020)

8.11. Environmental impact assessment (transport)

Table 46: total GHG emissions per year (in 2030) due to additional transport of collected waste oil

MS	T CO₂-eq.
Austria	0
Belgium	0
Bulgaria	179
Croatia	19
Cyprus	0
Czechia	0
Denmark	166
Estonia	49
Finland	16
France	1063
Germany	0
Greece	205
Hungary	517
Ireland	0
Italy	0
Latvia	0
Lithuania	50
Luxembourg	0
Malta	0
Netherlands	220
Poland	532
Portugal	0
Romania	2231
Slovakia	170
Slovenia	0

Spain	1442
Sweden	174

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: https://europa.eu/european-union/contact_en

On the phone or by email

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- at the following standard number: +32 22999696, or
- by email via: https://europa.eu/european-union/contact_en

FINDING INFORMATION ABOUT THE EU

Online

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EU publications

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EU law and related documents

For access to legal information from the EU, including all EU law since 1952 in all the official language versions, go to EUR-Lex at: <http://eur-lex.europa.eu>

Open data from the EU

The EU Open Data Portal (<http://data.europa.eu/euodp/en>) provides access to datasets from the EU. Data can be downloaded and reused for free, for both commercial and non-commercial purposes.

