



SCIENTIFIC OPINION PAPER // JULY 2020

Effectively tackling the issue of millions of vehicles with unknown whereabouts

European priority measure: establishing leakage-proof vehicle registration systems


German Environment Agency


Umwelt 
Bundesamt

Imprint

Publisher

Umweltbundesamt
Wörlitzer Platz 1
06844 Dessau-Roßlau
Tel: +49 340-2103-0
Fax: +49 340-2103-2285
info@umweltbundesamt.de
Internet: www.umweltbundesamt.de

 [umweltbundesamt.de](https://www.facebook.com/umweltbundesamt.de)

 [umweltbundesamt](https://twitter.com/umweltbundesamt)

Responsible unit:

Section III 1.6 Extended Producer Responsibility

Publication as pdf:

<http://www.umweltbundesamt.de/publikationen>

Dessau-Roßlau, July 2020

Any views expressed are the views of the German Environment Agency and may not in any circumstances be regarded as stating an official position of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety or the Federal Republic of Germany.

SCIENTIFIC OPINION PAPER // July 2020

Effectively tackling the issue of millions of vehicles with unknown whereabouts

European priority measure: establishing leakage-proof vehicle registration systems

by

Christian Kitazume, Regina Kohlmeyer
and Dr. Ines Oehme
German Environment Agency, Dessau-Roßlau

Issued in the context of the revision of Directive 2000/53/EC
(ELV Directive)

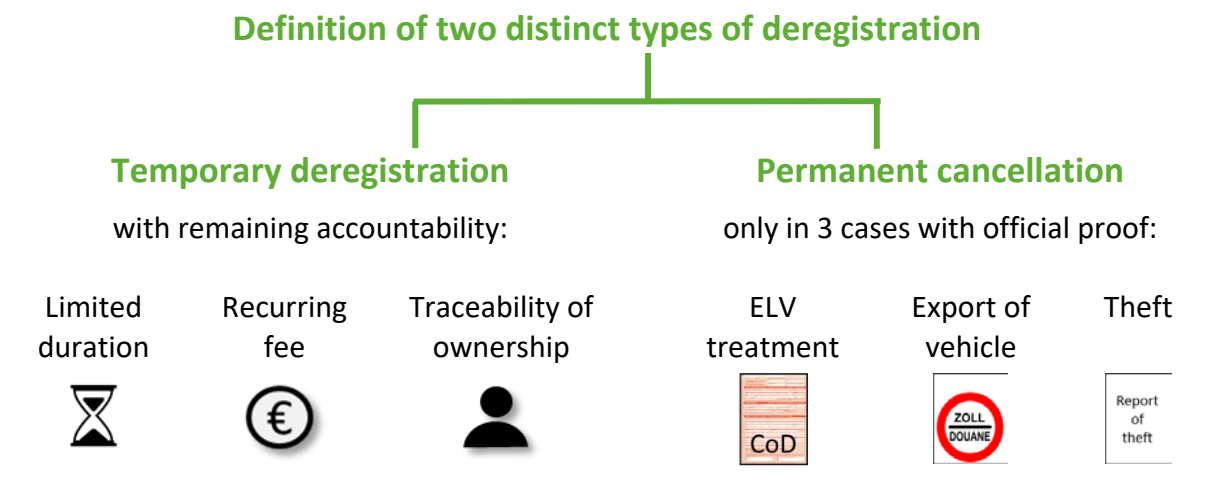
Abstract

6 million end-of-life vehicles (ELVs) are disposed of in the EU each year according to Eurostat statistics. However, annually, the fate of an additional 3.4 to 4.7 million deregistered vehicles is unaccounted for. A substantial share of this efflux is likely to be illegally treated or exported, thereby potentially causing environmental damage and harming European economies. To halt unauthorised treatment and illegal export of these vehicles with unknown whereabouts, an appropriate European framework for national vehicle registration systems is needed to effectively prevent leakage and intrinsically direct all ELVs into the more than 13,000 authorised treatment facilities. The certificate of destruction (CoD) as the current steering instrument under the ELV Directive 2000/53/EC can only be effective if embedded into appropriate vehicle registration/ deregistration systems.

The German Environment Agency therefore recommends to complement the CoD by the following minimum requirements for national vehicle registration systems (see Figure 1).

Figure 1: Minimum requirements for national vehicle registration systems

From a waste management perspective



Source: own illustration

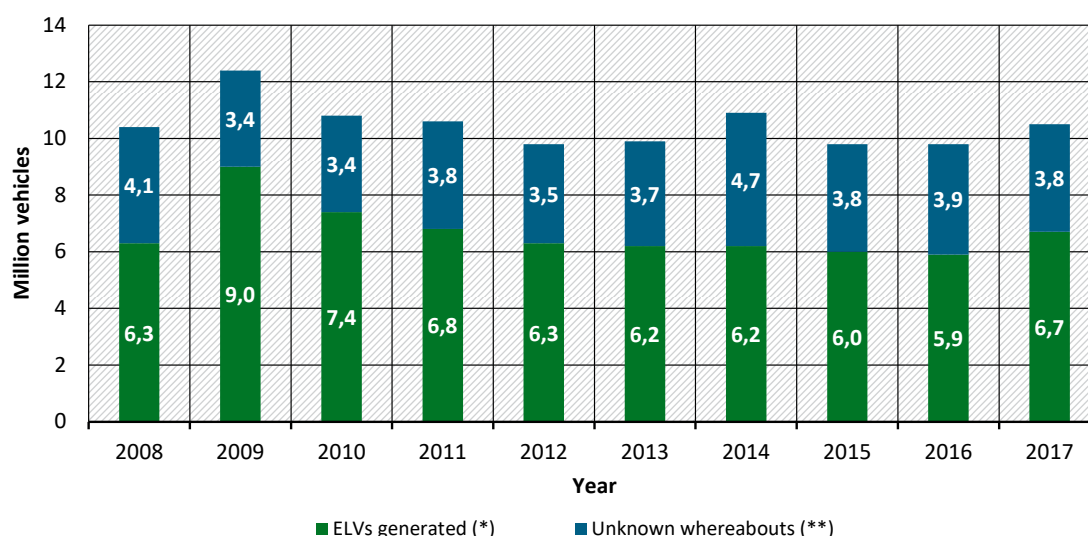
1 The Issue of Unknown Whereabouts

Directive 2000/53/EC on end-of-life vehicles (ELV Directive) aims at minimising the environmental impact of end-of-life vehicles (ELVs) and to improve resource efficiency. The Directive covers passenger cars (M1 vehicles) and light commercial vehicles (N1 vehicles). Annually, 5 to 6 million end-of-life vehicles (ELVs) are treated in more than 13,000 authorised treatment facilities (Eunomia 2019) throughout Europe (see Figure 2).

The fate of the vehicles annually retired from active stock can only partially be traced using the official statistical data on ELVs treated in authorised treatment facilities (ATFs) and exports of second hand vehicles: Studies for the European Commission identified an annual statistical gap of 3.4 to 4.7 million vehicles with unknown whereabouts (Mehlhart and Kosińska 2017), (Trinomics, Oeko-Institut 2020), accounting for roughly one third of all vehicles departing from the European vehicle stock. There is some indication, that a substantial share of these vehicles is subject to illegal waste treatment or export.

Figure 2: ELVs and vehicles with unknown whereabouts in the European Union

Number of M1 and N1 vehicles in the EU in million



(*) including Eurostat estimates for countries which have not reported complete data.

(**) Data for 2008 to 2014: Mehlhart and Kosińska 2017. Data for 2015 to 2017: Trinomics/Oeko-Institut 2020.

Sources: Eurostat 2019: Waste Database. End-of-life vehicles by waste management operations - detailed data (env_waselv): <https://ec.europa.eu/eurostat/web/waste/data/database>; Mehlhart and Kosińska 2017: Assessment of the implementation of Directive 2000/53/EU on end-of-life vehicles (the ELV Directive) with emphasis on the end of life vehicles of unknown whereabouts. <https://publications.europa.eu/s/i2Ov>; Trinomics/Oeko-Institut 2020: Study supporting the evaluation of the Directive 2000/53/EC on end-of-life vehicles, publication envisaged in 2020.

The illegal dismantling and export of ELVs is mainly motivated by profits from sale of spare parts and metals, thus likely neglecting proper depollution, to avoid additional costs. It is indicated to cause considerable environmental and economic damage (Mehlhart and Kosińska 2017) and might impair the efficiency and economic viability of the ATFs.

2 Environmental Impact of Illegal ELV Treatment

Proper depollution and treatment of ELVs is crucial for the environment, as ELVs contain hazardous components such as waste oil, refrigerants and heavy metals. For ELVs treated illegally, we can assume that proper depollution and disposal is mainly neglected. According to (Mehlhart and Kosińska 2017, page 10), between 20 and 55.2 million litres of hazardous non-fuel liquids from vehicles with unknown whereabouts are unaccounted for in the EU every year and pose the risk of being discharged into the environment.

Rough estimate of max. Global Warming Potential by refrigerant release

For the 3.8 million European vehicles of unknown whereabouts of 2017, we estimate the refrigerant contents to amount to approximately 630 t.¹ If released completely into the environment, this equates to a global warming potential (GWP) of about **900,000 tonnes of CO₂ equivalents.**²

Additional negative environmental impact can occur from reduced treatment levels of the ATFs, resulting from the pressure to compete with non-authorised dismantlers.

3 Economic Harm and Market Distortions Caused by Illegal ELV Treatment

ELV treatment in authorised treatment facilities is an important branch of the waste industry with over 13,000 authorised ELV dismantlers in the EU (Eunomia 2019, S. 52). Vehicles of unknown whereabouts are currently not treated in authorised treatment facilities, thus diverting substantial revenue from the authorised waste industry (cf. Table 1).

Table 1: Economic effects of illegal ELV treatment

Estimate of maximum cost of treatment for vehicles of unknown whereabouts and potential earnings from spare parts sales

	Per ELV in France (Terra et al. 2015) ³	Extrapolated to unknown whereabouts EU, 2017 ⁴	Possible adverse effects of illegal treatment
Labour cost ELV depollution and dismantling	237 EUR	900 million EUR	Tax evasion, social security fraud
Revenue from spare parts sales	502 EUR	1,908 million EUR	Lost revenue per ATF: up to 147,000 EUR*

* Total extrapolated revenues notionally allocated to 13,000 ATFs in the EU

¹ Rough estimate: residual refrigerant per vehicle: 300g, 69 percent of vehicles equipped with A/C (as for vehicles put on the market in 2001, cf. 'DAT-Report für das Jahr 2001', <http://www.autokiste.de/service/dat-report/>), assumption of 20 % salvage vehicles with total loss of refrigerant.

² The GWP of most common refrigerant R 134a is 1,430 x the GWP of CO₂ (https://www.umweltbundesamt.de/sites/default/files/medien/2503/dokumente/treibhauspotentiale_ausgewaehlter_verbindungen_und_deren_gemische.pdf)

³ Labour cost: weighted average for all 24 authorised treatment facilities in the study. Revenue from spare parts sales: weighted average for 18 authorised treatment facilities specialised on spare parts sale.

⁴ 3.8 million vehicles, see Figure 2.

Furthermore, **indirect effects** arise from competition of authorised treatment facilities with illegal ELV treatment:

1. Illegal ELV treatment bears potentially lower cost due to the possible non-compliance with the legal requirements:
 - a. lack of authorisation, documentation
 - b. improper disposal of pollutants
 - c. evasion of taxes and social security contributions

According to the French ELV study (Terra et al. 2015), the average costs for proper depollution, material dismantling for recovery, and administration in ATFs account for more than 100 EUR per ELV.

2. Competition raises the market value of ELVs, raising cost of acquisition for authorised treatment facilities.
3. Especially small authorised treatment facilities suffer from the high cost of equipment necessary for environmentally sound depollution and high grade recycling. The formal sector thus bears a high economic burden while illegal ELV treatment raises pressure on existing waste operators, increasing the risk of improper treatment in authorised treatment.

In addition to lost revenue to the legal sector and market distortions, illegal activity might also entail further **financial damages to the MS economies** and social security systems, since labour and revenue from illegal ELV treatment might not be properly taxed. Data about tax evasion and similar damage caused by illegal ELV dismantlers is not available (yet), but, considering the rough calculation of the potential in Table 1, a noticeable loss for the MS economies can be assumed.

4 Measures against Unauthorized Treatment and Illegal Export of ELVs

When studying the different Member States' vehicle registration systems, three main strategies for steering ELVs in ATFs can be identified to address the issue:

- ▶ leak-proof vehicle registration systems, tracing vehicle owners throughout the vehicles' life times
- ▶ stringent law enforcement, and
- ▶ monetary incentives for authorised ELV treatment.

These are also the main fields addressed by Mehlhart and Kosińska (2017) in addition to improved statistics. Of those three strategies, we deem requirements for vehicle registration systems potentially the most effective measure. While the vehicle registration systems are implemented on MS level, it is important to set a common framework of requirements for an effective steering of all ELVs into the authorised treatment facilities on EU level.

Complementarily, supporting law enforcement campaigns and additional monetary incentives may be implemented nationally at Member States' discretion.

5 Multiple benefits of leak-proof vehicle registration systems

By minimising illegal ELV treatment, a common framework for leak-proof vehicle registration systems in the MS significantly mitigates the adverse environmental and economic effects of illegal ELV treatment described above.

Overall, the expected benefits of this approach are fivefold:

1. enable environmentally sound depollution of all ELVs,
2. enable progress towards quality recycling and resource efficiency in the ELV treatment – even of future ELVs with their increasing complexity (e.g. electric vehicles) and demanding treatment procedures,
3. provide a level playing field for the waste operators,
4. reduce financial damages to the MS economies, and
5. reduce the need for enforcement in ELV treatment and ELV shipment; Mehlhart and Kosińska (2017) roughly estimated “it would easily take 1000 full-time inspectors” when it comes to vehicle export inspections.

In the context of the EU’s commitment to making the transition towards a circular economy, the ELV Directive is being evaluated in 2020 and will then be revised. We conclude that any advances in the course of the revision to establish **ambitious ELV treatment and recycling targets will only succeed, if an effective legal framework for steering all ELVs into authorised treatment facilities is created**, thus preventing leakage of ELVs into the illegal sector.

6 Vulnerabilities of Vehicle Registration Systems

We consider common requirements for vehicle registration systems essential, because some common vulnerabilities of individual Member States’ ELV/vehicle deregistration procedures can be identified. These vulnerabilities allow for “leakage” of vehicles from the register.

In an in-depth examination of effective approaches to address unauthorized treatment and illegal export implemented in EU member states, ADEME (2019) identified “traceability and sharing of information” (p. 104) as crucial components. However, this is not implemented sufficiently in all MS’ systems.

Factors like lacking traceability of deregistered vehicles and the possibility of an “unlimited” temporary deregistration make vehicle registration systems vulnerable to ELV leakage into illegal treatment or illegal export. For these vehicles, proper treatment cannot be ensured. To address these vulnerabilities, we recommend a framework to achieve traceability throughout vehicles’ life times and to define unambiguous conditions for vehicles’ deregistration. Complementarily, an electronic data exchange among the Member States could facilitate tracing vehicle ownership throughout the EU until they become ELVs.

Example: Germany

An analysis of the German vehicle registration system (Kohlmeyer et al. 2017) may serve to illustrate possible vulnerabilities:

- 1. Deregistration not limited in time:** The vehicle “deregistration” is in fact an “off-road notification”. Thus, depending on the subsequent fate of the vehicle (e.g. re-registration, export, scrapping), a “deregistration” can later turn out to have been temporary or permanent. Finally, entries of deregistered vehicles are deleted from the registry after seven years.
- 2. CoD not mandatory for vehicle “deregistration”:** Since the deregistration is an “off-road notification”, vehicles may be deregistered for multiple reasons, including temporary discontinuation of use, use on private property, sale, and export. As no proof is required for deregistration in those cases and ELVs cannot be identified reliably, it may be difficult in practice for the authorities to enforce the presentation of a CoD for all cases of ELV deregistrations.
- 3. Ownership of deregistered vehicles is not recorded:** The fate of vehicles is not controlled by authorities after deregistration for reasons of privacy. Consequently, vehicles can be exported or become waste any time after deregistration unbeknownst to authorities.

7 Conclusion: Recommendations for Requirements for Vehicle Registration Systems

In order to be effective at ensuring proper treatment of all ELVs, all vehicle registration systems must ensure traceability until the final cancellation of a vehicle from the register with appropriate verification. In conclusion, we recommend to establish the following minimum requirements for national vehicle registration systems on EU level:

1. Distinguish between temporary deregistration and permanent cancellation:

To differentiate between vehicles for which accountability needs to be retained in order to prevent illegal treatment, registration systems need to distinguish between temporary deregistration and permanent cancellation. Vehicles that will likely be re-registered in the national vehicle register can thus be temporarily deregistered while vehicles exported or disposed of shall be cancelled permanently.

2. Limit duration of temporary deregistration:

To ensure continued succession of accountability after deregistration, the duration for which a vehicle can be deregistered must be limited. After the given period (e.g. one year, as currently implemented in the Netherlands) a vehicle is re-registered for use on public roads to the owner or can be deregistered again temporarily. Temporary deregistrations must be tied to an administrative fee, in order to prevent continued deregistration of a vehicle after illegal waste treatment. The administrative fee for recurring deregistration ensures changes in ownership are reported to registration authorities and thus ensures the essential traceability.⁵

3. Establish conclusive list of conditions for permanent cancellation:

When a vehicle is permanently removed from a national vehicle registration system, it may be cancelled permanently from the registry. To prevent abuse, cancellation must be tied to a conclusive list of conditions, each requiring an appropriate official proof, see Table 2:

⁵ For vehicles exhibited in museums a fair solution should be established.

Table 2: Conclusive list of recognized proof for the permanent cancellation of a vehicle

Cause of cancellation	Proof to be submitted to registration authority
i. ELV treatment	Certificate of Destruction (CoD)
ii. Export to an EU member state	Notification of re-registration by importing MS (information exchange under Directive 1999/37/EC) (e.g. through EUCARIS) ⁶
iii. Export to third country	Customs certification (export notice) issued by customs authority ⁷
iv. Theft of the vehicle	Report of theft ⁸ by police and/or insurance company

These requirements ensure that registration systems are effective at preventing illegal ELV treatment in the EU by ensuring the use of a COD when ELVs are permanently cancelled from the registry. Otherwise, appropriate documentation about the fate of the vehicle must be presented or a recurring fee must be paid, preventing abuse of temporary deregistration. The temporary limit of deregistration also entails the need to document ownership continuously and thus establishes continued succession of accountability. To prevent illegal export of ELVs declared as used vehicles, binding and enforceable guidelines to distinguish between ELVs and used vehicles should be implemented⁹.

8 Implementation on EU level

The study on vehicles of unknown whereabouts conducted for the European Commission (Mehlhart and Kosińska 2017) demonstrated the issue's European dimension. Individual Member States like the Netherlands have implemented a system ensuring accountability for deregistered vehicles, though the Dutch system is vulnerable to fake exports (Mehlhart and Kosińska 2017). A requirement for the exchange of registration data in case of intra-EU exports, directly addressing this vulnerability of the Dutch system, can solely be implemented on EU level. Thus, the ongoing revision of the End-of-Life Vehicles Directive 2000/53/EC should be used to evaluate how the described minimum requirements for national vehicle registration systems can be implemented within the European legal framework.

⁶ Similar requirements are implemented in e.g. the Czech Republic and the Netherlands, even though there is indication that enforcement is difficult (ADEME 2019). EU-wide notification procedures are crucial for effective implementation and enforcement.

⁷ To prevent illegal export of ELVs as used vehicles, clear binding and enforceable criteria are necessary.

⁸ Or report of loss, in case of officially confirmed permanent irrecoverable loss of vehicle. The definition of "loss" and its proof have to ensure that abuse for "losses" into illegal treatment is prevented.

⁹ E.g., in Italy, a recent roadworthiness test is a condition for the export of second-hand vehicles. (ADEME 2019, page 8)

9 List of references

ADEME and Deloitte Développement Durable (2019): Global Overview of Incentive Schemes Aiming to Bring ELVs through Authorised Processing Channels. Viewed 2 March 2020: <https://partage.ademe.fr/public/e9e42c>

Eunomia, ivl (2019): Final Report on the Implementation of Directive 2000/53/EC on End-of-Life Vehicles For the period 2014–2017. Viewed 7 April 2020:

https://ec.europa.eu/environment/waste/elv/pdf/ELV%20Directive%20Implementation%20Report%202014-2017_Final%2027.06.19.pdf

Eurostat 2019: Waste Database. End-of-life vehicles by waste management operations - detailed data (env_waselv): <https://ec.europa.eu/eurostat/web/waste/data/database>

Kohlmeyer, Regina; Sander, Knut; Jung, Matthias; Wagner, Lukas 2017: Klärung des Verbleibs von außer Betrieb gesetzten Fahrzeugen. Viewed 28 May 2020: https://www.vivis.de/wp-content/uploads/RuR10/2017_RuR_283-304_Kohlmeyer

Mehlhart, Georg and Kosińska, Izabela 2017: Assessment of the implementation of Directive 2000/53/EU on end-of-life vehicles (the ELV Directive) with emphasis on the end of life vehicles of unknown whereabouts. Viewed 18 October 2018: <https://publications.europa.eu/s/i2Ov>

Terra, Deloitte, Biois 2015: Évaluation économique de la filière de traitement des véhicules hors d'usage. Viewed 18 October 2018: <https://www.ademe.fr/evaluation-economique-filiere-traitements-vehicules-hors-dusage-vhu>

Trinomics, Oeko-Institut: Service contract supporting the Evaluation of the Directive 2000/53/EC on end-of-life vehicles, commissioned by the European Commission, Contract ENV.F.1./FRA/2014/0063. Publication in preparation in 2020