REGIONAL POLICIES FOR CIRCULAR ECONOMY IN ITALY AND AN EMPIRICAL ANALYSIS OF PAY-AS-YOU-THROW TAX EFFECTS IN EMILIA ROMAGNA

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Abstract

A systematic transition towards circular economy (CE) explicitly became a major strategy at European Union level since 2015. Even though this EU-level boost is strong, a major role is played by regional implementation, since local needs and opportunities connected with CE may be very specific. The aim of this article is twofold. On the one side it highlights which policy instruments are most frequently used by Italian regional policy makers to implement measures supporting the transition to more circular economic systems. The analysis highlights specific regional strategies as well as recurrent policies; these last focus on waste mainly. On the other side, as “pay-as-you-throw (PAYT)” is strongly supported by the EU within the set of policies in favour of CE, an empirical analysis of the effects of the introduction of this waste taxation scheme is conducted. The case of excellence Emilia Romagna (ER) is considered, as it represents the first Italian Region imposing PAYT to all of its Municipalities by 2021. The effect of PAYT on the quantities of total and sorted urban waste generated is estimated, exploiting the difference-in-differences econometric technique with multiple treatment and time periods. Empirical results show that the effects of this policy in ER are coherent with the first best objective implied by EU Waste Hierarchy and therefore with the CE ones: the total quantity of waste generated decreases by 9.6%, with a non-significant increase of the sorted one.

Keywords: circular economy, difference-in-differences, pay-as-you-throw, regional policy, waste

1. Introduction

The circular economy (CE) concept finds many definitions (e.g. Kirchherr et al., 2017), but a common twofold ultimate objective emerges among them: CE systems are economic systems aiming to minimize, on one hand, natural resources extraction and, on the other, any flow of waste generated by human activities going back to the environment (EEA, 2017).

This new paradigm started being support by some businesses (Zucchella and Urban, 2019), banks (EIB, 2019) and policy makers especially during the last decade. The EU committed itself in the design of a comprehensive transition strategy towards CE since 2015. Implementation at a local level started in the last few years. The action of regional and local policy makers is fundamental for the realization of the new paradigm, because it entails a transformation of the production systems and rooted consumption habits. Moreover, the barriers to and benefits of the transition may be locally very specific (OECD, 2019). For instance, agricultural regions could focus on the diffusion of bioeconomy activities, urban areas on practices of the kind “product as a service”, and manufacturing regions on the support to product innovation through eco-design.

In this paper the European framework for CE transition is summarized. After that, we move to the Italian regional level, with particular attention to the kind of instruments used to introduce and apply CE principles in the regional policies. From Section 3 the analysis focuses on a case
study: the effects of “pay-as-you-throw (PAYT)” taxation on the types and quantities of urban waste generated in Emilia Romagna (ER) region. The case is relevant for at least two reasons. First, PAYT implementation is strongly supported by the EU and by a few Italian Regions, as a policy for CE. Second, ER comes out as the first Italian Region adopting a wide range of initiatives in favour of CE with effects on several economic sectors and on local public administration; PAYT is among these.

It is important to note that only a few empirical studies on the topic for cases in Europe exist; the case of ER is analysed for the first time. Moreover, both theoretical and empirical analyses actually provide mixed evidence on PAYT effects on households’ waste production behaviour (Gradus et al., 2019).

This paper contributes to the empirical literature on PAYT, but it also provides a novelty investigating the effects of this measure in a CE perspective. Is PAYT effectively an instrument for the prevention of waste production? Does it entail a substitution of unsorted with sorted waste only? Or does it crowd out environmentally friendly attitudes, with a total increase of waste generated? The work is concluded by some policy recommendations.

2. Policies in favour of circular economy

2.1. The EU framework

The Circular Economy Action Plan (EC, 2015) represents the fundamental document for the EU strategy for a comprehensive transition of the European economic system towards an as-circular-as-possible model. This document presents the CE as the tool to achieve long run environmental and economic sustainability and, consequently, it is a starting point for a new EU innovation trajectory.

The EU strategy realizes with interventions in various economic scopes and along the whole resource use cycle: production (eco-design, facilitation of industrial symbiosis, support to bioeconomy practices), consumption (green labels for products, waste production prevention, driving public demand towards sustainable supply), waste management, secondary raw materials market. The EU already enacted 54 actions in favour of the CE (EC, 2019a; EC, 2019b). The EU legislative and regulatory action was intense, and the same was for its direct and indirect economic intervention to promote and support investments and innovations within the scope of CE. Indeed, a relevant part of Horizon 2020 funds were directed in this sense and the Commission also encouraged Member States to use EFSI (European Fund for Strategic Investments) and Cohesion Policy funds for green investments and resource efficiency projects. The regulatory intervention in the field of waste at the EU level has an earlier origin. Indeed, the Waste Framework Directive (EC Directive, 2008) is particularly important, because it states the European waste management targets. These are summarized by the so called “Waste Hierarchy”. The first best objective for environmental sustainability is represented by waste production reduction, followed by reuse, recycling, energy recover and disposal. Therefore, waste prevention represents the first best objective for waste policies. Moreover, the directive introduced the “polluter pays” principle and the extended producer responsibility one.


The European Green Deal has been launched in December 2019 and it emerges now as the “new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use” (EC, 2019d). The Green Deal is an integral part of this Commission’s plan to implement the United Nation’s 2030 Agenda and the Sustainable Development Goals. The Green Deal also introduces a new CE action plan (EC, 2020) which is hinged on the design and production phases, with the aim to ensure that the resources used are kept in the EU economy for as long as possible.

2.2. The Italian regional level

Local authorities play a very relevant role in implementing policies in favour of the CE, particularly at a regional government level, since local barriers and opportunities connected with CE may be very specific. This paragraph gives an overview of the most relevant initiatives for the CE at the Italian regional level, and how they introduced the CE principles in their normative system. The qualitative analysis of the Regions’ actions to improve circularity highlights the use of three policy instruments mostly: Research and Innovation Strategies for Smart Specialisation (RIS3 or S3), single regional laws (RL) and Regional Waste Management Plans.

Regions are required to elaborate research and innovation strategies for a “smart specialization”, in order to benefit from the EU Cohesion Policy (EC, 2012). The EU aim is to achieve a more efficient use of European Structural Investment Funds and to increase the synergies among Community, national and regional policies. The S3 identifies a regional innovation and industrial transformation trajectory starting from a medium-long run development vision.
shared by many stakeholders of various nature (“Entrepreneurial Discovery Process”). The S3 is also based on the analysis of the region’s specific competitive advantages, resources and socio-economic structure. In practice, the S3 provides a multi-faceted policy mix for the allocation of Cohesion Policy funds (ERDF, EFS and EAFRD especially).

The analysis of Italian Region’s S3 documents, which have been published between 2014 and 2016, with a planning horizon until 2020, highlighted just one case in which the CE concept have been explicitly integrated in the S3: Emilia Romagna Region.

This region’s S3 specifies seven economic sectors of specialization, each of them corresponding to an industrial cluster, and four cross-sector thematic strategies: industry 4.0, big data, blue growth, circular economy. The document defines some strategic objectives for each specialization sector, 71 in total (ERR, 2018); of these, 22 are at least in part correlated with the cross-sectorial strategy “circular economy”. Moreover, the CE is one of the trajectories of development of the specialization sector “Energy and sustainable development”. Overall, Emilia Romagna Region chose a structure for its S3 in matrix form, in which the cross-sectorial strategies shape the innovation objectives of each economic specialization scope, with the aim to achieve a comprehensive transition.

Piedmont Region also developed a S3 clearly in favour to the circular transition, even though the concept of CE is not explicitly mentioned in the document. The policy maker defined six economic sectors of specialization, among which clean tech and green chemistry (PR, 2016). These sectors are supported in their expansion according to two “development trajectories”: the smart trajectory and the resource efficiency one. The development trajectories influence the process of structural evolution of Piedmont economy. In particular, the resource efficiency trajectory is conceived as the promotion of competences and efficiency processes for a more sustainable regional economy and a reduction of natural resources use. For example, this trajectory realizes for the case of the cleantech/green chemistry sector in the following objectives: creation of biorefineries for chemical products, biofuels and bioplastics production; management and extraction of valuable resources from waste and wastewater; support to the secondary raw materials industry.

Eventually, Lazio Region doesn’t mention CE in its S3, but it selected the “green economy” as a specialization sector. The sector development is supported through the promotion of research for eco-innovation, of industrial symbiosis projects, measures for waste reduction (LR, 2016).

In conclusion, the introduction of the CE concept into the regional S3 generally implies a rather comprehensive intervention on the various phases of products’ life-cycle (R&D, production, commercialization, end-of-use) and it directs the incentives for innovation, public-private and interregional collaborations towards this paradigm. Formally, the S3 is structured in matrix form in the two main cases observed, with the aim to foster circular innovation and transition across the specialization sectors. In the cases of these regions, it emerges a clear long run development vision marked by environmental sustainability.

Some Regions introduced the CE principles in their own normative system through specific laws. This is the case of Friuli Venezia Giulia (FVGR, 2015; FVGR, 2017), Umbria (UR, 2009), Marche (MR, 2018), Basilicata (BR, 2018) and again Emilia Romagna (ERR, 2015). These laws are generally aimed to implement structural actions. These laws provide for eco-innovation incentives, targets and policies for waste management, the establishment of discussion forums for stakeholders of different nature in order to confront on practical CE barriers and projects.

However, regional policy makers focused their interventions on the waste scope mainly until now, defining measures and targets for waste management and for their prevention. Indeed, the guidelines of those policies are provided in the Regional Waste Management Plans. This approach is certainly inappropriate for a structural and comprehensive transition towards CE, because it is just focused the end-of-life phase. In other words, waste management policies aim to achieve environmental sustainability only, and neglect production and consumption phases. Nevertheless, waste management policies are fundamental to pursue two CE goals: waste reduction (first best goal); generating high-quality waste streams for recycling.

3. Case study: the effects of pay-as-you-throw taxation on waste production

Taking into account what emerged from the analysis of EU and regional policies for CE it is clear that most of the normative interventions are oriented to resources end-of-life phase. Taxation is one of the instruments considered as useful by the EU in order to direct households waste production behaviour towards the objectives defined by the Waste Hierarchy, especially PAYT taxation schemes (EC, 2014; EC Directive, 2008; EP, 2017). PAYT or Unit Pricing Systems (UPS) are urban waste taxation schemes in which the amount of the due fee depends, at least in part, on the quantity of unsorted waste generated by the single household. They are based on volume or weight criterion. Reviews of various collection systems practically implementing PAYT are given by e.g. Reichenbach (2008) and Skumatz (2008).

In this section an empirical analysis of the effects of PAYT introduction is conducted, in order to check if the results of this measure are effectively in favours of the CE ultimate objectives. Indeed, on the one side the support to this instrument within the scope of waste management/CE policies by the EU and a few Regions in Italy (see section 4) is strong, but, on the other, the literature on European cases shows a mixed
evidence on the effectiveness of PAYT schemes and that a scarce number of empirical analyses is available. More specifically, the case of Emilia Romagna region is considered here for the first time in the literature.

3.1. Theoretical background and literature review

PAYT taxation schemes belong to what is referred to as “benefit taxes”. According to economic theory, an efficient decentralized financing system for local administrations should be based on the benefit principle: the burden of financing the services supplied by local governments should fall on the community benefitting of them and the burden should be proportional to the quantity of public good, i.e. service, received (Messina et al., 2018). Waste management should be suited for the application of a benefit tax, with positive outcomes both for local finance (Skumatz, 2008) and the environment. A tariff proportional to the amount of waste generated carries out the Pigouvian function of including in polluters’ private costs the negative externalities bore by the whole community. In other words, UPS are coherent with the previously mentioned “polluter pays principle”. The large majority of Italian Municipalities still implement the “Tassa sui rifiuti – Tax on waste” (Ta.Ri.), which is very far from the logic of the benefit tax. Ta.Ri depends on the house and family dimension and it is not conceived to measure the service effectively demanded by a single household.

Actually, even though the effects of this policy instrument have been investigated in the US since longtime (e.g. Fullerton and Kinnaman, 2000; Huang et al. 2011), very few empirical analysis were conducted for cases in Europe. Among these: Allers and Hoeben (2010), Dijkstra and Gradus (2009), Linderhof et al. (2001) deal with Dutch cases; Carattini et al. (2018) on Switzerland. Bucciol et al. (2015) and Valente and Bueno (2019) examined Italian case studies: the first used data for Treviso district; the second investigated the application of PAYT in the city of Trento. Therefore, both considered different geographical scopes with respect to this paper.

Importantly, results on PAYT effectiveness differ across studies and geographic areas, possibly because the policy effectiveness may vary across different social environments (see, e.g., Kipperberg, 2007) or because of different implementation systems. More specifically, two effects could be observed: an effort in waste prevention, acting in favour of total waste generated reduction; a substitution of unsorted (priced) waste with the sorted (unpriced) type, acting in favour of recycling but not of waste prevention (see Section 4). Depending on the magnitude of these two effects, very different consequences from a waste management point of view are expected. In principle, one may argue that only if a prevention effect is observed and combined with a non-positive variation of sorted waste quantity (in terms of weight) the policy can be considered really in favour of the CE ultimate goals: shrinkage in the use of raw materials, efficient use of resources and, consequently, waste production reduction.

Eventually, non-monetary incentives are also determinants of household waste generation behaviour: considering behavioural economics literature (e.g. Ariely et al. 2009; Gneezy and Rustichini, 2000) introducing a fee on unsorted waste may even crowd out the intrinsic motivation to sort and to avoid waste generation, associated with environmentally friendly attitudes.

3.2. PAYT in Emilia Romagna (ER) region

Here, the case of ER is more specifically considered, because it is the Italian Region that more strongly supports the implementation of this policy.

ER was the first Italian Region intervening to support the transition to PAYT systems, through the RL 16/2015 (ERR, 2015). This sets ambitious goals in terms of reduction of total waste generated and share of sorted over total waste. To achieve these objectives, the law provides for the implementation of PAYT schemes in all the Municipalities of the region by the end of 2020. PAYT started being applied in 2013. In 2019, the number of Municipalities enacting UPS was 81 out of 331 total Municipalities in ER.

The list of Municipalities adopting PAYT is available on ER Region website (https://ambiente.regione.emilia-romagna.it/it/temi/economia-circolare/tariffa-puntuale/elenco-dei-comuni-a-tariffa-puntuale). Data on urban waste are published by ISPRA (https://www.catastori.fruenti.isprambiente.it/index.php?pg=downloadComune&width=1129&height=635&advice=si): this analysis considers annual data at municipal level, for all and only the Municipalities of the region (331), for the period 2010-2018 (latest available year). The number of municipalities implementing PAYT by 2018 is 53 (Fig. 1).

3.3. Empirical methodology: difference-in-differences with multiple time and treatment periods

Differences-in-differences (DiD) strategies are panel-data, quasi-experimental methods applied to
estimate the effect of a “treatment”: sharp changes in the economic environment or changes in government policy, for example.

In DiD models, a treatment group, i.e. individuals for which the treatment is observed, and a comparison (control) group, not receiving the policy, are identified. The impact of the treatment is inferred from the (possible) different average variation of a certain variable of interest experienced by the two groups over time. This means that DiD estimators take into account both common trends and cross-sectional differences.

DiD models rely on the “common (or parallel) trends” assumption: this assumes that, in the absence of the treatment, the average variation of the outcome variable would be the same for the control and treatment groups. In this case, the control group provides a valid counterfactual for the time evolution of outcomes in the treatment group absent the treatment. Under this assumption, a DiD model is suited to control for time-invariant unobservable characteristics of the two groups.

The DiD methodology has been used to evaluate the effects of PAYT in Allers and Hoeben (2010); Bucciol et al. (2015); Carattini et al. (2018), for example.

Because Municipalities in Emilia Romagna started to implement PAYT in different years since 2013, our estimation is based on the following econometric model for a DiD on multiple time and treatment periods (Eq. 1):

\[ Y_{it} = \alpha_0 + \alpha_1 PAYT_{it} + \sum_{t=2010}^{2017} \alpha_t \text{year}_{it} + \beta \text{Policy}_{it} + u_{it} \]  

In this model: \( i \) indicates a Municipality in Emilia Romagna; \( t \) a year (2010-2018); \( PAYT \) is a dummy equal one for all Municipalities implementing PAYT somewhen between 2010 and 2018: this represents our treatment group; \( \text{year} \) is a full set of year dummies: in this way we control for time trends, i.e. year fixed effects; \( \text{Policy}_{it} = PAYT \times \text{year} \) is a dummy equal one for treatment units in the post-treatment period: when this term is positive, the policy is actually implemented in a specific Municipality and year. Therefore, the average treatment effect of the policy is measured by \( \text{Policy}_{it} \) coefficient, \( \beta \).

Outcome variables \( Y_{it} \) are: logarithm of the quantity of per capita total waste generated; logarithm of the quantity of per capita sorted waste generated (kg*inh./year).

### 4. Case study results and discussion

According to the estimation generated by using (Eq. 1), the introduction of PAYT significantly reduced the annual amount of per capita total waste generated by 9.7%, while the policy does not have significant effects on sorted waste production (Table 1). The results of the analysis presented in this paper are very close to the ones predicted by Valente and Bueno (2019) for the Italian city of Trento, despite the use of a different methodology, with a non-significant increase of sorted waste and an average variation of total waste by -8.6%. As said, previous literature results on PAYT effects on total and sorted waste production are mixed. For example, Bucciol et al. (2015), Kipperberg (2007), Linderhof et al. (2001), and in part also Carattini et al. (2018) find that pricing unsorted waste leads to a reduction of total waste generated, but also to an increase of sorted waste. On the other side, Allers and Hoeben (2010); Dijkgraaf and Gradus (2009); Kinnaman and Fullerton (2000); Valente and Bueno (2019) find no significant effect of PAYT introduction on the quantities of recycling waste generated.

**Table 1.** Estimated effects of PAYT introduction on the (log) quantity of per capita (pc) total waste generated – col. 1 - and on the (log) quantity of per capita sorted waste generated – col. 2

<table>
<thead>
<tr>
<th></th>
<th>pc total waste (1)</th>
<th>pc sorted waste (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAYT</td>
<td>-0.016 (0.017)</td>
<td>0.238*** (0.037)</td>
</tr>
<tr>
<td>year2010</td>
<td>-0.012 (0.018)</td>
<td>-0.383*** (0.040)</td>
</tr>
<tr>
<td>year2011</td>
<td>-0.018 (0.018)</td>
<td>-0.315*** (0.040)</td>
</tr>
<tr>
<td>year2012</td>
<td>-0.064*** (0.018)</td>
<td>-0.327*** (0.040)</td>
</tr>
<tr>
<td>year2013</td>
<td>-0.090*** (0.018)</td>
<td>-0.317*** (0.040)</td>
</tr>
<tr>
<td>year2014</td>
<td>-0.059*** (0.018)</td>
<td>-0.260*** (0.040)</td>
</tr>
<tr>
<td>year2015</td>
<td>-0.044* (0.017)</td>
<td>-0.196*** (0.039)</td>
</tr>
<tr>
<td>year2016</td>
<td>-0.028 (0.018)</td>
<td>-0.119** (0.040)</td>
</tr>
<tr>
<td>year2017</td>
<td>-0.048** (0.017)</td>
<td>-0.102** (0.040)</td>
</tr>
<tr>
<td>Policy</td>
<td>-0.097*** (0.024)</td>
<td>0.027 (0.055)</td>
</tr>
<tr>
<td>Constant</td>
<td>6.456*** (0.013)</td>
<td>5.874*** (0.029)</td>
</tr>
<tr>
<td>Observations</td>
<td>3070</td>
<td>3070</td>
</tr>
<tr>
<td>R²</td>
<td>0.025</td>
<td>0.080</td>
</tr>
<tr>
<td>F Statistic</td>
<td>7.894***</td>
<td>26.483***</td>
</tr>
</tbody>
</table>

Note: * p<0.1; ** p<0.05; *** p<0.01; s.e. in brackets
The econometric technique exploited in this paper may encounter some limitations. First of all, DiD methodology fails to include the possible effects of time-varying unobservable characteristics. Second, further analysis is required to ensure external validity: the results refer to the case of Emilia Romagna only; it must be considered that PAYT may be applied with different specificities in other regions.

Summarizing, the results of our empirical analysis suggest that the introduction of PAYT represents a policy instrument which is perfectly coherent with the EU Waste Hierarchy: a prevention of waste production is observed, while a substitution of unsorted waste with the sorted type is not.

If the policy would simply induce a substitution of unsorted with sorted waste, with a constant amount of total waste generated, this would represent a second best in terms of environmental benefits, as stated by the Waste Hierarchy. In the case of an increase of total waste production, the monetary incentive would have completely crowded out household’s environmentally friendly attitudes. None of these situations is observed. Therefore, PAYT can be considered a good instrument for waste reduction and, consequently, a measure consistent with the circular economy objectives.

Unfortunately, in Italy this policy instrument has been introduced only in a small number of Municipalities. ISPRA estimates (ISPRA, 2018) that 13.2% of Italian Municipalities apply a taxation of the PAYT type. The figure tripled with respect to the 2015 census, but Ta.Ri remains largely prevalent. These municipalities are typically of small dimension, mainly located in Veneto, Emilia Romagna, Trentino Alto Adige and Lombardy.

Considering regional policies, the transition to PAYT tariffs is one of the objectives of Lombardy Region’s Waste Management Plan (LoR, 2018). This sets the implementation target to the 20% of Lombard Municipalities within 2020. However, the Plan census found only 147 Municipalities with PAYT (9.7% of the total) in 2017. Also Sardinia (SR, 2016) and Friuli Venezia Giulia (FVG, 2017) Regions incentivize the change to PAYT. Overall, Italian Regions’ legislative efforts in favour of PAYT seem to be limited.

5. Conclusions

In this paper we go through the policies and the instruments in favour of the transition to the circular economy (CE) on different levels, from the EU to the Italian Regions. This last scope of analysis represents a novelty to the economic policy literature.

At the EU level, the transition is seen as a major strategy for sustainability and competitiveness in the medium-long run. The approach in terms of policies is multi-faceted and these intervene in many scopes: raw materials, production, consumption and waste management.

At the Italian regional level, the CE principles have been introduced into the regional authorities’ interventions through three instruments, mainly: regional Smart Specialization Strategies (S3), regional laws or Waste Management Plans. The S3 approach is the most systematic one for CE implementation. Indeed, it is based on a medium-long run regional development vision shared by many stakeholders, it influences the innovation trajectories of various economic sectors and it usually presents a comprehensive policy mix for their implementation. Unfortunately, Emilia Romagna (ER) is the only Region explicitly mentioning the CE in its S3; a few other Regions inserted the CE principles or very closely related concepts, without mentioning CE itself.

The large majority of Regions mention CE only in their Waste Management Plans. Even if waste management policies are not enough for a whole CE implementation, these policies have been applied with the same objective (i.e. achieving EU Waste Hierarchy) and similar instruments across Europe. Among these policies, the diffusion of PAYT waste taxation schemes is supported by the EU and, among the Italian Regions, by Emilia Romagna especially, where it will be mandatory for all Municipalities before 2021.

Despite this support to PAYT implementation, only a few empirical researches examine its effects considering European case studies. Moreover, results on PAYT effectiveness differ across studies and geographic areas. More specifically, two effects on household behaviour could be observed: an effort in waste prevention, acting in favour of total waste generated reduction; a substitution of unsorted (priced) waste with the sorted (unpriced) type, acting in favour of recycling but not of waste prevention. Only if a prevention effect is observed with a non-positive variation of sorted waste (in absolute terms) the policy can be considered really in favour of the CE ultimate objectives, while substitution is just a second best. This paper analyses PAYT implementation from a CE perspective: this is also a novelty to PAYT literature.

For the first time, the Emilia Romagna case is investigated in order to check for the two effects mentioned above. The analysis relies on a difference-in-differences methodology with multiple time and treatment periods on ISPRA data. The aim is to compare Municipalities implementing the policy and not. Results show that PAYT significantly reduced the annual amount of per capita total waste generated by 9.7%, while the measure does not have significant effects on sorted waste production. This means that PAYT induces a prevention effect, without causing a substitution of unsorted waste with the sorted type, for the case of ER at least.

In conclusion, Italian Regions should adopt a more comprehensive approach in terms of scopes of interventions to support a systematic transition to CE. Regional S3s seem to be a coherent policy instrument for this. Nevertheless, waste management policies are crucial in order to close the loop of resources use in an efficient and sustainable way. Within this scope, PAYT
taxation turns out to be, for the case of ER, a measure which is perfectly functional to the EU Waste Hierarchy first best goal, i.e. waste prevention, and therefore to the CE objectives.

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