## Restoring the incentives for eco-design in EPR: The challenges for eco-modulation

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# A long-time EPR researcher

TAKE IT BACK: EXTENDED PRODUCER RESPONSIBILITY AS A FORM OF INCENTIVE-BASED ENVIRONMENTAL POLICY<sup>1</sup>

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ABSTRACT

This paper doubles strended products responsibility (FFR), as energing approach to locative-hand environmentel parks; Socratines howers as assundances table hold or product strendship. ERE incompressibility or products not for environmental inpart of environmental inpart inpart

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(EPR).2 The German Minister of the Environment, Hans

Töpfer, created this approach nearly from scratch when he proposed the Ordinance on the Avoidance of Packaging Waste in 1990.<sup>3</sup> Under the provisions of the Ordinance,

producers are required to "take back" discarded packaging for recycling from waste generators, thereby deliberately

shifting the responsibility for waste management from final consumers to materials producers, product manufacturers

and retailers. In so doing, the Ordinance seeks to force

producers to incorporate waste management-related concerns into product design and marketing decision

making. Recyclability now competes with all of the other conventional concerns in product design such as cost of

inputs, manufacturability, compatibility with the distribution

chain, functionality, safety, and so on.

KEYWORDS: Estended Producer Responsibility; Massifacturer Take Back; Product Stewardship; Economic Incentives; Gen Ordinance: Product Life Cycle

#### INTRODUCTION

Incentive-based approaches to environmental policy are increasingly attracting attention and even cachet in policy circles. Seen as a way of correcting market failure in a coreffective manner, incentive-based approaches such as pollution (Pigovian) taxes, tradeable credits, deposit-refuting systems or liability requirements are lauded both because they force the incorporation of environmental damages into market prices—and therefore correct skewed provides fineshility and, hopefully, the potential for least oct approaches to environmental improvement.

To this list of familiar policy instruments, however, must be added a new approach: extended producer responsibility

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#### **EPR** Reference Database

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#### Welcome

This is a database of references to research, debate, and policymaking publications related to Extended Producer Responsibility (EPR), a policy strategy that assigns responsibility to producers for products when they become waste.

#### Focus

The primary focus of the database is on grey literature (i.e., reports self-published by governments, industry and NGOs). It also contains references to journal articles, books, conference presentations, statutes, court cases, annual reports, web sites and many other sources. It is a bibliography and does not contain the documents themselves. The documents are not part of the database because Yale does not hold the copyright to those publications.

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#### The World's Only EPR cartoon?



#### 1. Eco-modulation 101

#### 2. The Challenges of Restoring Eco-Design Incentives

#### 3. Meeting the Challenges

## 4. Conclusions

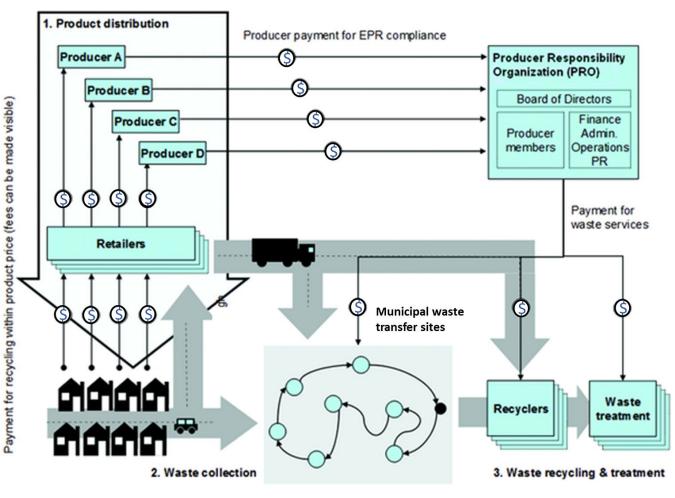
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## Eco-modulation 101

#### Why Eco-modulation?

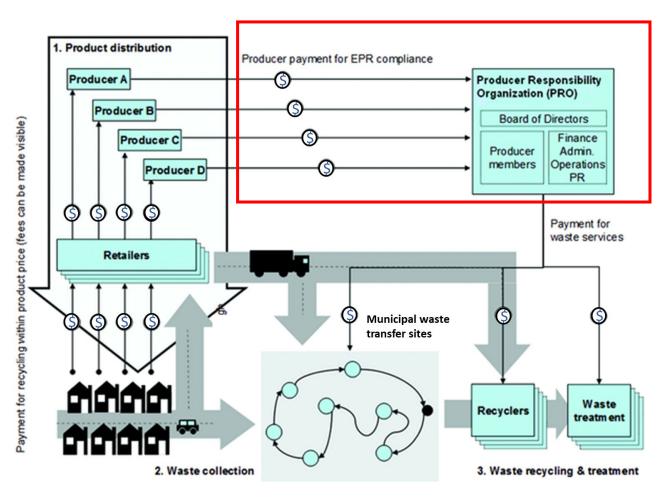
## The Problem: Collective EPR



Adapted from Mayers 2013

#### Why Eco-modulation?

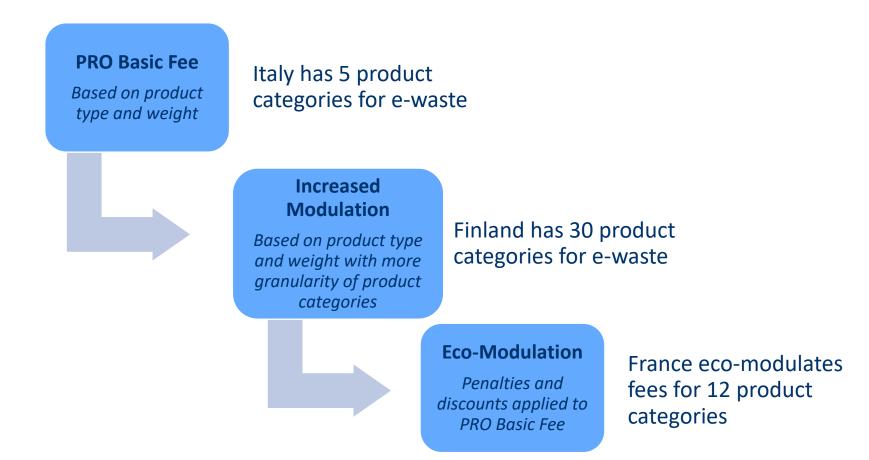
Collective EPR limits incentives for ecodesign



Adapted from Mayers 2013

# **Eco-modulation** aims to restore the eco-design incentives missing in EPR

#### The Remedy: Eco-modulation



### Eco-modulation for packaging: Discounts and penalties

Characteristic	Discount or Penalty
Recyclability	Penalty: Problematic components
Recycled content	Discount: Recycled content above specified threshold
Transparency	Discount: Use of LCA
Public education	Discount: Education campaigns and information
Hazardous materials	Penalty: Use of additives or presence of residues

#### Modulation Already Exists

25 EU Member States and the UK have EPR schemes for packaging waste

Eunomia, 2020. Study to Support Preparation of the Commission's Guidance for EPR Schemes

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	'Basic' modulation - i.e. different fees per material type	Greater granularity in fee structure - e.g. specific fees for certain types of packaging e.g. PET/HDPE, beverage cartons etc.	'Advanced' modulation (e.g. penalty fees, or numerous different fee levels within material type
Austria	Y	Y	
Belgium	Y	Ŷ	
Bulgaria	Y	Y	
Croatia	Y	Y	
Cyprus	Y	Y	
Czech Republic	Y	Y	
Estonia	Y		
Denmark	-	-	-
Finland	Y	Y	
France	Y	Y	Y
Germany	Y	Y	
Greece	Y	Y	
Hungary	-	-	-
Ireland	Y	Y	
Italy	Y	Y	Y
Latvia	Y		
Lithuania	Y	Y	
Luxembourg	Y	Y	
Malta	Y		
Netherlands	Y	Y	Y
Poland	Y		
Portugal	Y		Y
Romania	Y	Y	
Slovakia	Y	Y	
Slovenia	Y	Y	
Spain	Y	Y	
Sweden	Y	Y	Y
UK	Y		

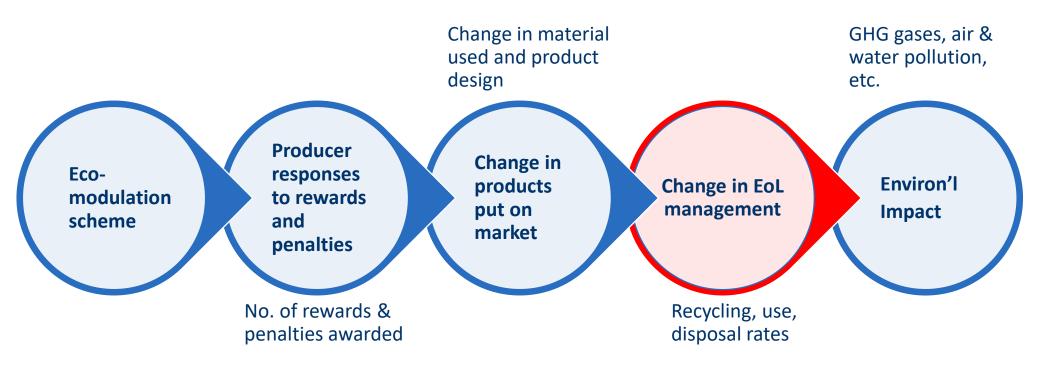
### Key Components of Eco-Modulation

- Product Scope
- Objectives
  - Recyclability
  - Recycling rate
  - Problematic substances
  - Recycled/sustainable content
  - Increase life span (durability, reusability, repairability, refillability)
- Technical Criteria
- Fee Structure
  - Granularity
  - Penalties and discounts
- Fee Magnitude

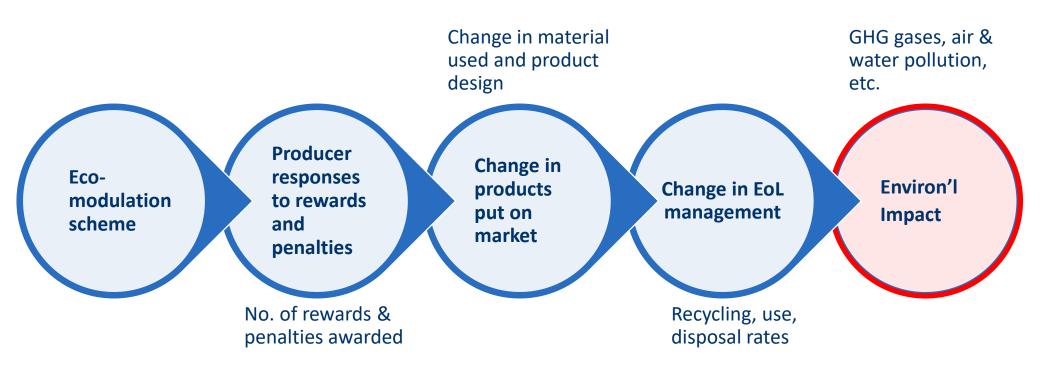
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# The Challenges to Eco-modulation

## EPR typically focuses on improving recycling rates



### Circularity is only an intermediate goal

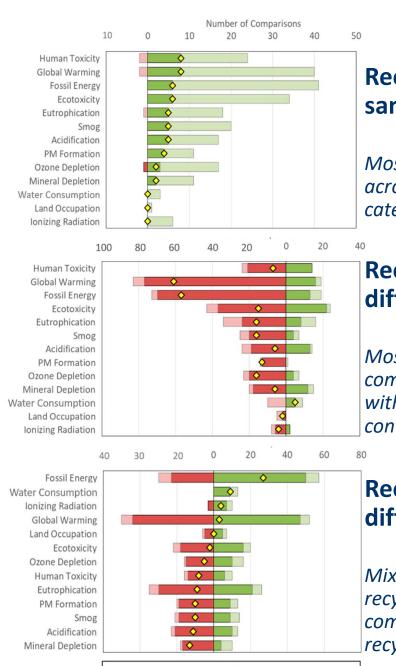


### Product Attributes are an Unreliable Proxy

The material attributes of packaging is not a consistent guide to environmental preferability

Vendries, et al. 2020. The Significance of Environmental Attributes as Indicators of the Life Cycle Environmental Impacts of Packaging and Food Service Ware. Env Sci. & Tech. 54(9), 5356–5364.

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■ <=0.75 ■ >0.75 & <1.0 ■ >1.0 & <1.25 ■ >=1.25 ♦ Net Result

## Recycled Content, same material

Mostly performs better across impact categories

#### **Recycled Content, different material**

Mostly performs worse compared to material without recycled content

#### Recyclable, different material

Mixed results for recyclable material compared to non recyclable material

#### Eco-modulation can lead to perverse outcomes

Extended product lifespans may prolong use of less energy-efficient appliances



Reusable packaging requires multiple cycles to outperform single-use alternatives



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#### **Practical Difficulties in Implementation**

Ineffective incentives from eco-modulation

#### Fees and Prices, France, 2018

Items	Eco-mod fee (€)	Average sales price (€)	Fee/ price
Textiles	0.007	18.0	0.04%
Smartphones	0.02-0.04	280.0	0.007%
1.5L water bottles	0.01	0.62	1.6%
Car tires	1.25	70.0	1.8%
Refrigerators	20.0	440.0	4.5%
Washing machines	10.0	370.0	3.2%

Vernier, 2021

Data management, verifiability, and traceability



Insulation of producers from eco-modulation through online sales



## Harmonization is Limited and Difficult

Many stakeholders call for harmonization, but...

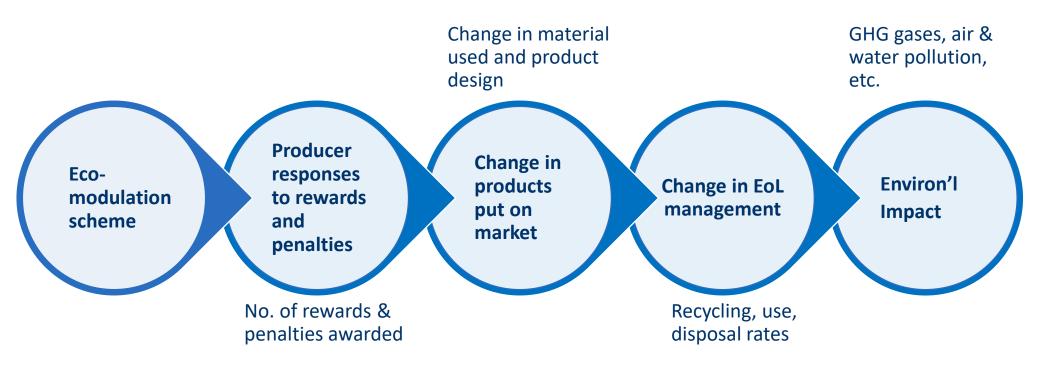
#### Why so little harmonization?

- Disagreement or differing interests among producers
- Producer resistance to "harmonizing up"
- Limited domestic constituency
- Concerns about stranded assets
- Legal barriers to enforcing consistency
- Government reluctance to cede control to other entities or levels of government
- Path dependency and cost of adjustment
- Underlying differences in product markets and waste systems

#### Effects of lack of harmonization

- Costs to producers
- Difficulty in evaluating impact
- Increased incentives for free-riding
- Weak market signal

#### **Evaluation is complicated**



#### Will we know if eco-modulation works?

EPR has a poor track record for policy evaluation

- 1. Limited, poor data
- 2. Methodological obstacles
- 3. Little history of policy evaluation after implementation

*"There is a serious lack of both technical and financial data."* - OECD, Updated Guidance Manual for Efficient Waste Management Yale school of the environment

# Meeting (some of) the Challenges

#### **Increasing Connection to Environmental Outcomes**

#### Use LCA to inform policy design

- Innumerable statements of European Commission for need for life cycle approach
- Some (very limited) precedents
  - CONAI (Italian packaging PRO)
  - WEEE Forum (association of e-waste PROs)
  - Product environmental footprint (EU method for measuring environmental footprints)
  - Low Carbon Fuel Standard (California)

#### **Oregon Innovates**

*Largest 25 producers evaluate and disclose life cycle environmental impacts for 1% of covered products every two years* 

Bonuses that reward evaluation and disclosure of environmental impacts

#### Addressing Evaluation Challenges

- More data collection, more data harmonization
- Systematic collection of data from PROs
- Life cycle assessments
- Natural experiments
- Detailed case studies
- Occasional deep dives—not possible if data is not available

#### Take-aways

- Restoring eco-design incentives likely to be more difficult than expected
- Will be difficult to assess success
- => However, impending implementation is propelling considerable activity in industry
- Change the norms in policy discourse and analysis
  - Data availability, verification, transparency critical
  - Ex post policy evaluation

#### For more detail, see



Lifset, R., H. Kalimo, A. Jukka, P. Kautto, M. Miettinen. 2023. Restoring the Incentives for Eco-design in Extended Producer Responsibility: The Challenges for Eco-modulation. *Waste Management*. 168: 189-201. <u>https://doi.org/10.1016/j.wasman.2023.05.033</u>

or see



Interview in *Resource Recycling* <u>https://bit.ly/RR-ecomod</u>

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