Extended producer responsibility and competition

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EPR in a nutshell

- Some essential features of EPR
  - Shifting responsibility away from waste management services and towards manufacturers and retailers, with the aim of fostering the achievement of SWM targets
  - usually: recycling and resource efficiency, but not necessarily
  - Transforming the financial basis of SWM: from end-of-pipe charges to advance disposal fees incorporated in product prices
- EPR variants
  - Degrees of industry involvement may vary
  - Scope of EPR schemes may vary (eg include business waste or not; include orphan waste or not)
  - May entail a vast range of policy instruments
  - Individual (company) vs. collective (sector, cluster of sectors)

EPR: a success story?

- Some expected outcomes of EPR
  - "Closing the loop" by incorporating waste-related externalities in the production process
  - Facilitate recycling via improved product design
  - Boost recycling industry via reverse logistics
- Empirical evidence
  - Impact on product design and upstream innovation lower than expected
  - Spectacular increase of separate collection and recycling rates, driven by reverse logistics and integration of recycling markets
  - Cost effectiveness: despite the critics, evidence shows EPR is cost-effective in the long run (no clear evidence that costs could be lower otherwise)

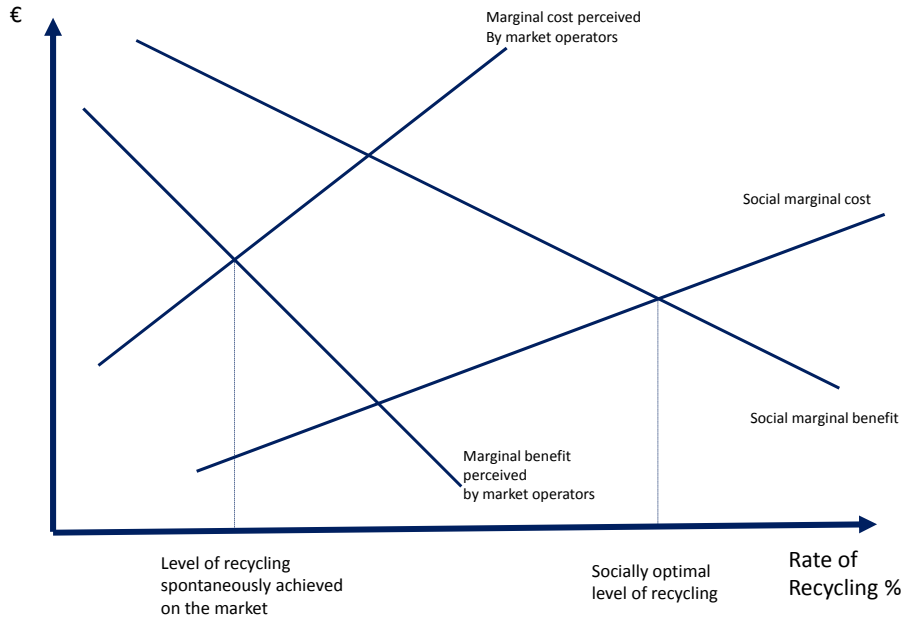
Why many economists do not like EPR

- Often associated with mandatory targets and take-back requirements; criticism against MT is extended to EPR (Pearce-Brisson; Dijkgraaf)
- Often associated with monopolistic organizations having strong market power and able therefore to distort market functioning
- Could be used to raise non-tariff barriers to trade
- Not effective for streamlining upstream innovation, while recycling could be attained with less distortive approaches (Kinnaman)
- Inefficient cost duplication (Porter)

What does evidence show?

- Evidence hard to deny; but empirical results also cannot:
  - Before the advent of EPR, only minor recycling rates were considered feasible
  - EPR has driven very quickly RR close to 100% for some materials (eg batteries, oil) and up to 70-80% for many others
  - EPR has generated a booming market for handling and processing materials along the reverse logistics value chain (Italy: 2.500 companies, 12.000 employees, 4,2 B€ turnover)
  - Once cost comparison accounts for the full cost (and not only the share paid by producers via the PRS) cost-effectiveness results higher
- Walls (2004) points out that:
  - if the market works properly, EPR would be unnecessary;
  - a waste collection charge incorporating externalities (eg a landfill tax, tax on raw materials) would be equivalent
  - But are markets efficient? Probably not
- EPR as a second best policy aimed at solving market failures
  - ECJ (2000): a legal monopoly does not necessarily violate competition law, if it is the least restrictive way to achieve a mission of general economic interest

Market failures in the market of recycling



Transactions costs

- Transactions costs in the SW recycling market
  - Ensure coherence of product design with post-consumption
  - Identification of destinations of waste-derived materials
  - "Market for lemons" due to costly quality assessment
  - Sunk costs (eg research about potential reuse; treatment facilities; adaptation of plants that receive waste-derived materials , logistics
  - Risk of disruptive competition and wasteful double-investing in the early development of the recycling industry due to uncertainty
- **EPR allows to abate some of these costs and to provide a more effective structuration of the reversed logistics**

Secondary market price volatility

- Empirical evidence shows very high turbolence
  - Volatile secondary prices and related risk (face to the PSO of dealing with all waste) ⇔ exposed to the market power of buyers
  - Thin market ⇔ bilateral transactions (especially for "poor" materials, for which transport costs are significant
  - From the point of view of SWM operators, planning of SWM capacity is more uncertain and leaves opportunity to freeride to those having access to the best contracts
- **EPR allows to pool the risk associated to price volatility and to allocate it on the subject that is in the best position for managing it; SWM operators can concentrate on the core business of organizing collection**

Market power and economic margins

- The pre-condition of market trades:
  - Someone is willing to pay X
  - Someone is willing to accept Y
  - X > Y
  - Y – X is the economic margin, and can be allocated to both according to the relative market power
  - In a competitive market, the economic margin, Y – X, tends to zero
- In the WM industry, a similar mechanism operates, but there are some specific features
  - The economic margin, Y – X, is negative (unless the avoided cost for alternative disposal solutions are considered among the benefits)
  - Municipalities are willing to pay X for getting rid of materials (X = CUC + CTD)
  - Recyclers are ready to pay Y = PR for receiving them
  - If (Y-X) > (CSC + CPR) recycling is socially convenient
- **EPR as a way to re-equilibrate market power and ensure fair sharing of the value-added**

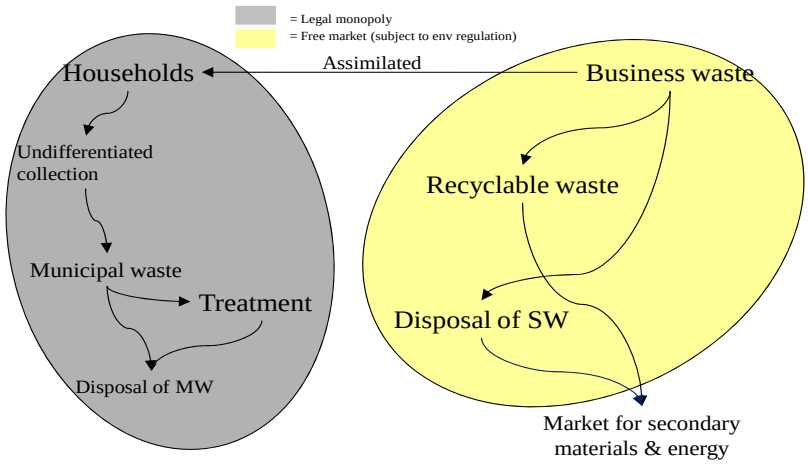
A Copernican Revolution

- Recycling yesterday and today
  - Recycling has ever existed spontaneously, and still does in developing economies wherever a positive value can be exploited
  - Diminishing returns + "Baumol disease" ⇔ cheaper to dispose of waste rather than engage in recycling
  - The turning point: emergence of social costs + scarcity costs of disposal (not immediately incorporated in market prices)
- Fundamental difference between today's and yesterday's recycling:
  - Previously recycling was driven by market forces ⇔ residual waste = independent variable (issue of security of supply)
  - Economic rationale for recycling is mostly driven by the high and rising cost of traditional disposal
  - Nowadays, the "zero-landfill" target justifies increasingly demanding targets for recycling ⇔ achieving these targets implies a "general interest" that goes beyond the market value of recovered materials
- EPR as a "strict liability" principle ⇔ industry as the "cheapest cost avoider" (not necessarily "producer")

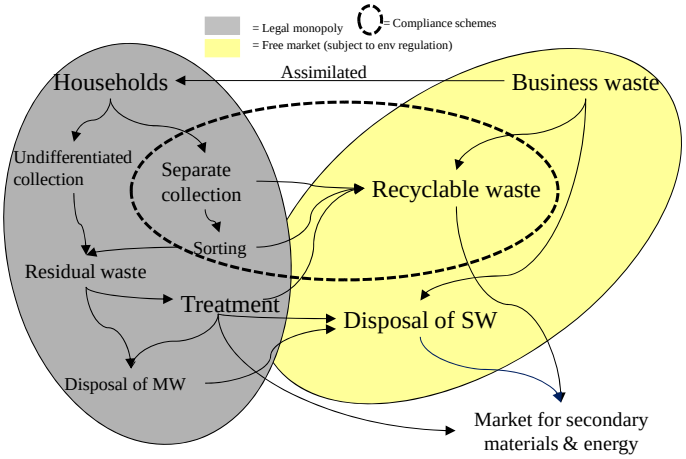
The Strange case of Dr. Recycl and Mr. Hide

- Achieving recycling targets implies a systemic effort and cannot rely simply on WM operators
  - Higher recycling rates imply long value chains: opportunities for reuse are far from the original material, either in an industrial or geographical sense
  - Economies of scale ⇔ geographical size of the recycling market is increasingly global, not easy to cope with for SWM operators
  - Economies of scope ⇔ integration of flows of different origin
  - Recycling opportunities require industrial innovation and entail significant gains from trade
- An often neglected issue: illicit WM
  - Long value chains, create the case for illicit arbitrage
  - Estimates in Italy: 22 Mt/yr (20% of total) simply "disappear"
  - This is particularly the case when trade opportunities involve developing countries ⇔ "capture of control" and asymmetric regulation
- **EPR as a way to strengthen social control in order to prevent illicit destination "dressed up" as recycling**

Household and business waste: yesterday



Household and business waste: today (and tomorrow)



Pros and cons of EPR

- EPR-based organizations help reducing market failures and improve performance of recycling markets
  - Market creation ⇔ creating a more predictable market setting that reduces risks associated to sunk cost and protects specific investments
  - EPR allows to implement waste management strategies oriented at landfill minimization ⇔ public service obligation = guarantee achievement of recycling targets
  - EPR allows to establish social control over waste flows
  - Allow to allocate costs on a subject that is in the best position to pass the incentive throughout the value chain ⇔ better social acceptance
- However, they also create risk of new and more subtle market failures arising from market power PROs acquire with respect to:
  - Municipalities and municipal operators ⇔ easy to exploit since obliged to provide solutions anyway given the high social cost of waste management failure
  - Recycling industry ⇔ "cannibalization" of independent operators
  - Participants to the scheme ⇔ "cost-plus" finance; discrimination
  - Distortion of secondary markets for raw materials
  - Weak incentive to upstream innovation ⇔ trade-off between upstream and downstream effectiveness
  - Cost is "hidden" ⇔ risk of engaging in excessively high recycling targets
- **Institutional design is important for reducing these risks**

Competition among PRS

- Arrangements in the EU vary
  - Monopolistic scheme with mandatory adhesion and compulsory fee (Italy) + independent market operators
  - Competitive systems with little-no autonomy over contracting patterns with local authorities (eg Germany)
  - Competitive systems with one of them having a public service obligation for a last-resort umbrella contract (France)
  - Competitive system (UK)
- Trade-off: making public service obligation sustainable, without creating market distortions
  - Monopolistic schemes are consistent with advance disposal fees ⇔ equivalent to "funded" retirement schemes
  - Market schemes do not guarantee automatically final result
  - Choice depends on how much the system can "afford" to miss recycling targets (are alternative options available? For how long?)
  - The more concentrated the product (and retail) market, the less need for a monopolistic PRS?

Determinants of cost allocation

- Sources of contractual power for the municipality
  - The higher the target posed onto EPR
  - Competition among different EPR schemes / possibility to bypass the EPR scheme
  - Relative efficiency in separate collection / sorting
  - How easy it is to shift cost onto consumers
- Sources of contractual power for the PRS
  - Possibility to achieve target from other waste flows (eg commercial waste) ⇔ cross subsidies
  - Higher disposal price ⇔ higher WTP of municipalities for SC
  - Small municipalities
  - Differences along the country

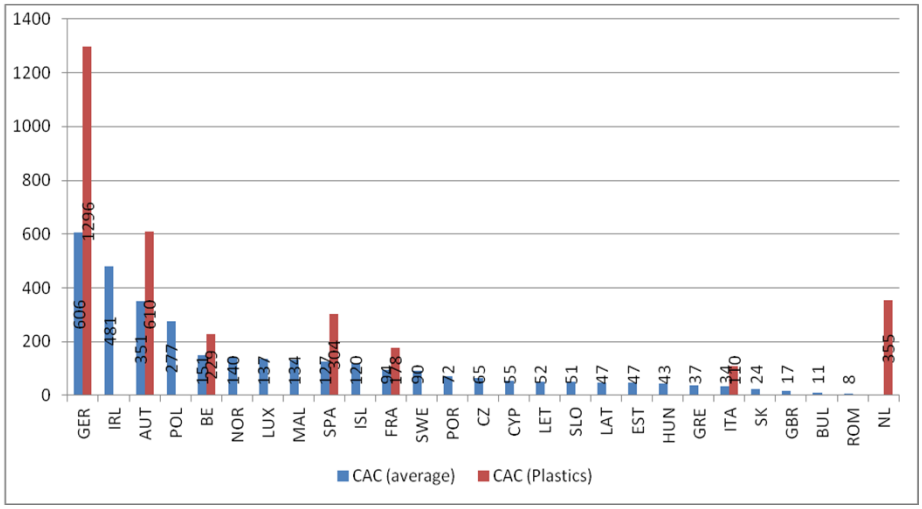
Allocation of costs in practice

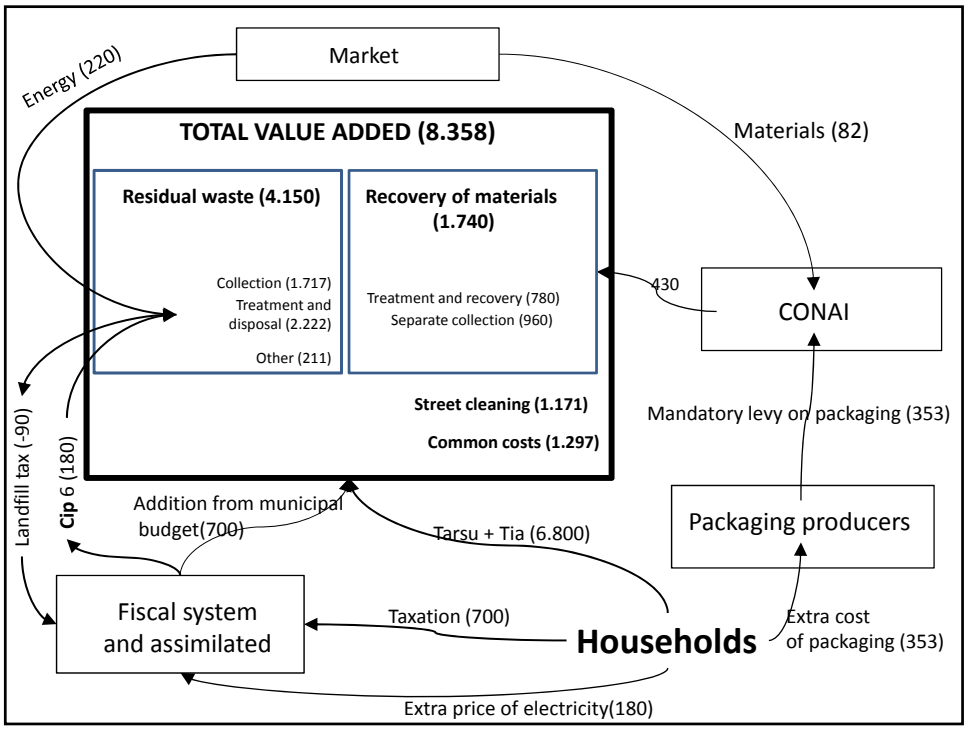
- Who pays for recycling?
  - If the cost is born by the entity in charge for WM, it ends up in the waste charge or in the municipal budget
  - If paid by EPR schemes, it ends up in the market price of goods
- Patterns of cost allocation between EPR systems and municipalities may vary (and hamper comparisons)
  - Full-cost base:
    - the EPR bears directly the cost of separate collection
    - Municipality saves entirely the cost of managing waste
  - Additional cost base:
    - the EPR pays the difference between the cost of separate collection and the alternative
    - The average municipality is indifferent whether to engage in separate collection or not
    - The relatively efficient municipality has the incentive to maximize efforts

"Terms of trade" vary from country to country

- Figure (next slide) shows very high differences among countries with resprct to the amount of prices paid by PRS to WM collectors
- If we adjust the figures taking into account the share of the total cost that rests on the SWM budget, most differences disappear.
- The full cost per ton collected/recovered is
  - 260/369 €/t in Portugal (Ferreira et al., 2012),
  - 200-250 € in Italy (Massarutto, 2010)
  - 207/225 €/t in Austria (EEA, 2005a).

Contributions paid by packaging waste EPR systems for sorted urban waste





Some policy lessons

- Arguments in favour of legal barriers protecting PROs are still relevant (but probably fading)
  - "Infant industry" ⇔ protect investments involving sunk costs
  - Risk of free riding ⇔ ensure that all producers participate
  - Enforcement of "public service obligations" that implicitly arise from the centrality assumed by recycling in the SWM system
- Causes of success revisited
  - CCO vs PPP
  - Emphasis on producers vs. on industry
- Optimal balance cannot be assessed once forever
  - As any second best optimum, involves some trade-off
  - Conditions may change according to geography, intermal market characteristics, history etc
  - Careful micro-institutional analysis needed ⇔ no easy answer
- Need to ensure a resilient policy design
  - Requirements change ⇔ avoid lock-in
  - Avoid "resting on laurels" on good results achieved

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