

# Extended Producer Responsibility (EPR) when consumers care for environment

**1st International EIMpack congress**

**30 November 2012**

**Lisbon**

- With an EPR, producers have to meet a take-back requirement :
  - Producers have to collect and treat the waste associated with its products.
- An EPR is an optimal policy :
  - if producers bear the social marginal cost of waste management.

- If the final market is not competitive, is the EPR an optimal policy ?

1. Assumptions on products, consumers and producers.
2. Comparison between social optimum and private market equilibrium with an EPR.
3. Optimal Policy.

## Assumptions on products

- Differentiation by environmental quality of packaging.
- Two materials to produce packaging :
  - **One recyclable, the other not.**
- The degree of recyclability indicates the part of recyclable material in packaging.

## Assumptions on consumers

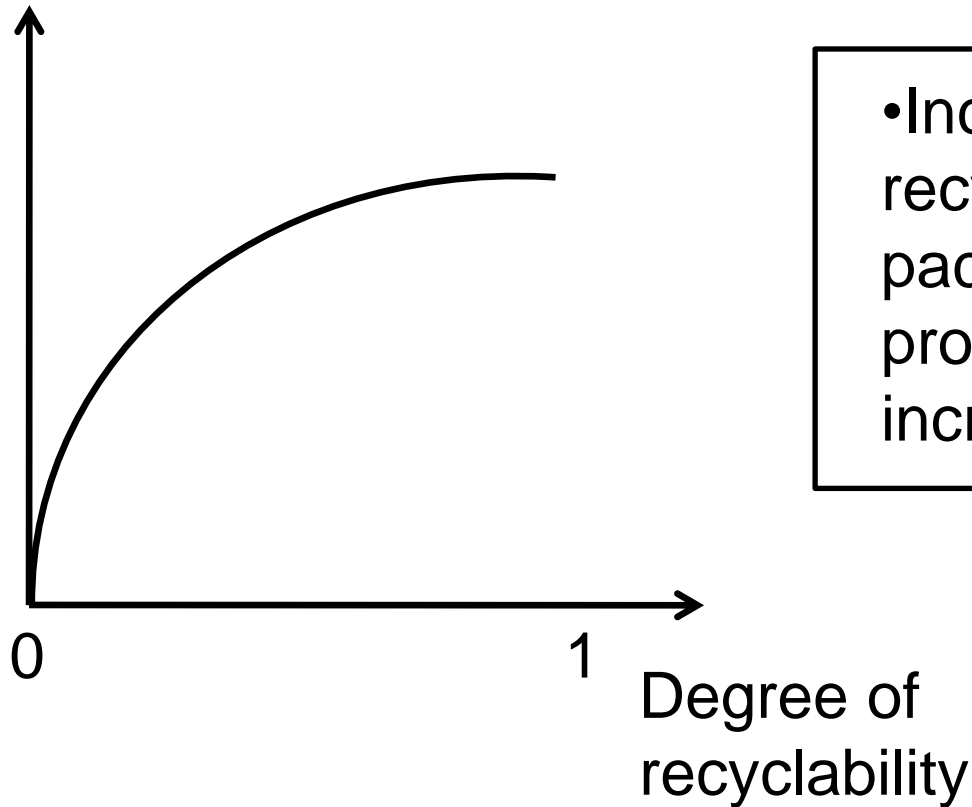
- Each consumer buys only one good from one producer.
- Consumers prefer packaging with high degree of recyclability.
- Consumers differ in their willingness to pay for environmental quality of packaging.

## Assumptions on producers

- There are two producers.
- Each producer chooses a different degree of recyclability.
- Producers bear :
  - the production cost of packaging,
  - the waste management cost of packaging.

# Production cost

Cost of  
production

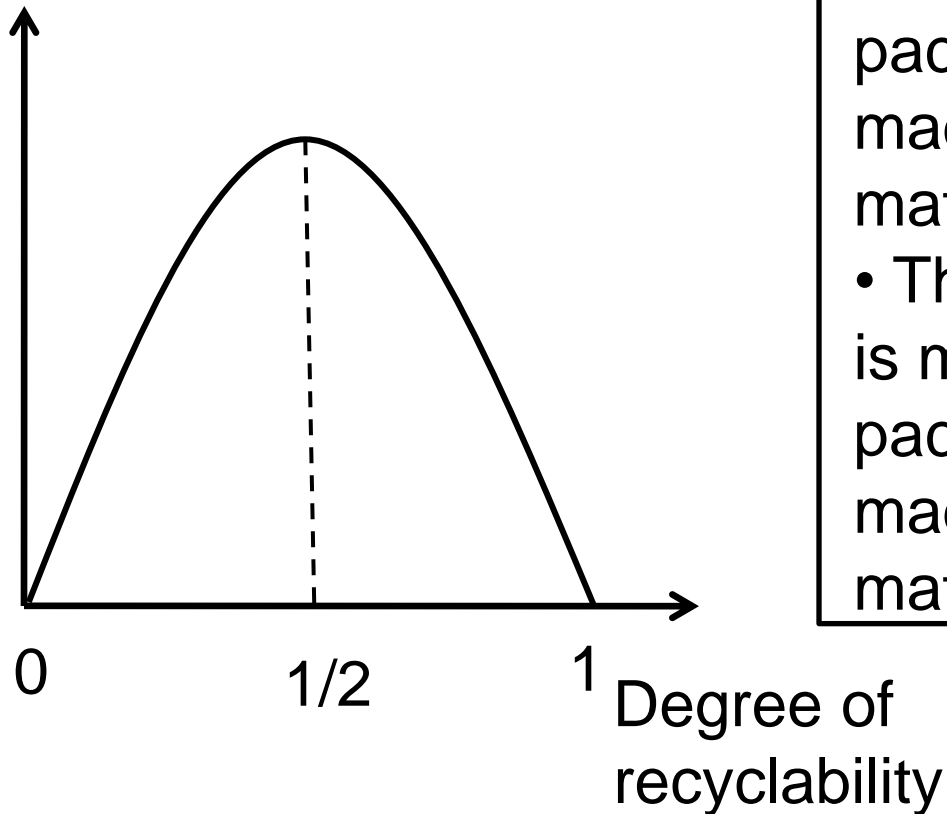


- Increasing the recyclability of packaging increases production cost at increasing rate.



# Separation cost

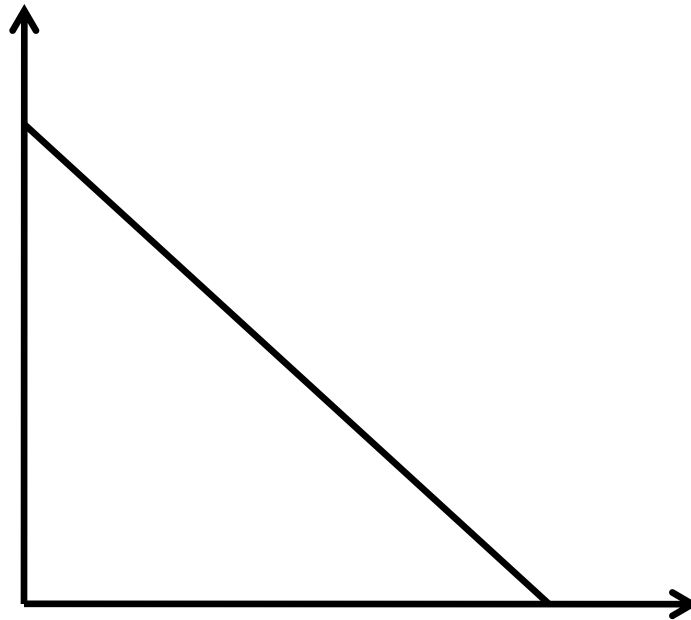
Separation cost



- The separation cost is zero if the packaging is only made up of one material.
- The separation cost is maximal if the packaging is equally made up of the two materials.

# Treatment cost

Treatment  
cost



0

1 Degree of  
recyclability

- The treatment cost is zero for recyclable material.
- The treatment cost is linearly decreasing with the degree of recyclability.

- If producers bear the social marginal cost of waste management :
  - **Packaging is too much differentiated.**
- An EPR which equals the social marginal cost is not an optimal policy.

- The rate of EPR has to be different according to the step of waste management :
  - Producers have to bear a cost less than the social marginal cost for waste separation.
  - Producers have to bear a cost more than the social marginal cost for waste treatment.

# Thank you for your attention

- Social Optimum

$$\rho_L = \frac{b + 3a + 4(w - d)}{8(c - d)} \quad \rho_H = \frac{3b + a + 4(w - d)}{8(c - d)}$$

- Private market equilibrium with EPR :

$$\rho_L = \frac{5a - b + 4(w - d)}{8(c - d)} \quad \rho_H = \frac{5b - a + 4(w - d)}{8(c - d)}$$

(a,b) : willingness to pay  
d : separation cost

w : disposal cost  
c : production cost

- Separation tax :

$$t_d = d + 2(d - c)$$

- Disposal tax :

$$t_w = b + a + w + 2(w - c)$$

(a,b) : willingness to pay      w : disposal cost  
d : separation cost              c : production cost