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Increasing resource efficiency through environmental innovations - The case of ICT products

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**The 3rd International Conference on Eco-Efficiency
Modeling and Evaluation for Sustainability: Guiding Eco-Innovation and
Consumption**

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- Aim: Development of a policy mix to increase resource efficiency and to minimize environmental impacts of consumption
- Steering capabilities of national governments / EU under globalized product life cycles
- Focus: EU / industrialized countries → what can OECD countries do to govern impacts of „their“ consumption?
- Example: ICT Products
 - priority waste stream (EU);
 - variety of problems & market failures;
 - example for globalized production and consumption patterns
 - example for unequal spatial distribution of environmental impacts and shift of environmental burdens

Deficit Analysis / Market Failures along Globalized ICT Product Life Cycles

→ Why are resources (private goods) not allocated efficiently?

Multitude of problems; most critical in this example:

- Information deficits (states, producers, consumers, recyclers);
- Weak and asymmetrical internalization of environmental impacts;
- Bounded authority of governments (authoritative reach);
- Perverse incentives from existing regulation.

Deficit Analysis / Market Failures along Globalized ICT Product Life Cycles

- 1) Information deficits from globalized product life cycles:
Intransparencies along the product life cycle

Actors	Examples for Information Deficits
Producers	Criticality of raw materials (mid- to long term shortages vs. short term focus on reporting years) Material composition of pre-products
Consumers	Environmental impacts of their own consumption (lack of awareness)
State (Regulator)	Material composition of products Origin of material used in products Criticality and environmental impacts of raw materials
Recyclers	Material composition of products Use of hazardous materials

Deficit Analysis / Market Failures along Globalized ICT Product Life Cycles

2) Weak and asymmetrical internalization of environmental impacts;

Developing countries:

No internalization of impacts e.g. from mining and disposal in developing states

→ No price signals for producers to avoid environmental impacts

→ No financial incentives (price signals) for producers to use secondary material

Developed countries:

Attempts to internalize parts of environmental impacts, e.g.

Waste Regulation: implicit incentives to export end-of life products to developing world

Deficit Analysis / Market Failures along Globalized ICT Product Life Cycles

3) Bounded authority of governments (authoritative reach);

Developing states:

- e.g. informal mining and recycling sector,
- lack of enforcement capacity

EU:

- impacts take place outside authoritative reach of the EU
 - spatial divergence of consumption and impact precludes direct influence
- lacking enforcement capacity (e.g. Basel Convention)



Deficit Analysis / Market Failures along Globalized ICT Product Life Cycles

4) Inappropriate existing regulation

- focuses almost exclusively on end-of life side
- Does not take into account globalized life cycles (assumes that end-of life products stay where they were used and are not exported)

Perverse incentives from existing regulation

- Recycling as cost factor / implicit incentive to get rid of old products
- Illegal exports of e-waste; loss of resources ('low tech recycling')

Possible Access Points for a EU Policy Along the Globalized Life Cycle

Life Cycle Stages that take place in the EU:

- market access of products
- public and private demand & use
- (disposal) partly in developing countries; already regulated in EU (WEEE)

→ Exploring how regulation (market access) and demand side measures would work together?

Kinds of Environmental Innovations & Proposed Policy Mix:

Technology Change	Diffusion / Market Penetration
Radical	Strong
Incremental	Weak

P O L I C Y M I X :

(Jänicke 2010: 219)

Knowledge & Information
as pre-condition: Information and
Certification Requirements

Demand side pull:
Government
Procurement

Regulative push:
Setting minimum
standards

Instrument 1: Information Generating Instrument: Information & Certification Requirements in Supply Chains

- Aim: avoiding knowledge deficits from globalized product life cycles
- Basis for further policies & policy instruments
- Comparable to REACH
- Producers / Importers have to provide a data sheet (content of products; origin of materials) → Precondition for market access
- Possibly combined with certification scheme (e.g. FSC, Kimberley)
- Possibly combined with labelling (→ consumer behavior)
- Might be formulated as requirement under the Eco-Design Directive
- Instrument can be combined with ban of certain materials



Instrument 2: Public Innovation Procurement

- Aim: create public demand / economic incentives for radical technological innovations
- Public procurement based on resource efficiency criteria:
 - Top-runner approach: public procurement focuses on procuring the technologically leading products (→ e.g. Top 10% of products identified through information & certification requirements)
 - Technological competition between firms determines the procurement standards / the “speed” of technological innovations
 - Procurement standards can be formulated more encompassing than existing approaches (based on environmental impact assessments; including radical technological change)
- Contribution to EU’s discussion on demand-side innovation instruments

Instrument 3: Setting Dynamic Standards (Regulation)

- Aim: better products (higher material efficiency) and diffusion of innovative products into mass market
- Setting dynamic minimum standards
 - according to specific product groups, using information generating instrument
 - e.g. restricting the use of specific, problematic materials or
 - demanding minimum quota for the use of secondary material
- Adherence to standard as precondition for market access
- Standards might be formulated according to the public procurement standard (e.g. 20% less).
- Possibly formulated as requirement under the Eco-Design Directive
- Market exclusion of “bad performers”

Conclusion:

- Globalized product life cycles contribute to intransparent flows of material and limited government authority (no direct influence on impacts)
- Existing regulation does not take into account globalized life cycles and needs to be supplemented
- Market access and public demand as possible access points for a EU policy mix
- Information as crucial precondition for regulation and innovation
- Demand side measures (public procurement) to push innovation (target: best performers)
- Regulation (minimum standards) to eliminate inefficient products
- Combination of influencing demand and dynamic standard setting as new policy mix for higher resource efficiency