ECO-INNOVERA

Ministry of Infrastructure and the Environment

From **Eco-Innovation** to **Systemic Innovation**

Robbert Droop

- Netherlands' Ministry of Infrastructure and the Environment
- Eco-Innovera

Eco-Innovation is .....

Ref. EcoAP – COM(2011)899

… any form of innovation ....

.... resulting in or aiming at significant and demonstrable progress ...

.... towards the goal of sustainable development, ...

.... through reducing impacts on the environment, ...

.... enhancing resilience to environmental pressures, ...

.... or achieving a more efficient and responsible use of natural resources.

- ……over and above legislative requirements
- …. includes eco-industry and other sectors
- …. includes products/processes, value-chains, and systems

Some experiences in Netherlands

Business-cases:

- Jeans for Jeans (J4J)
- Closing the gypsum chain
- Food, Paper

Chain action works ….

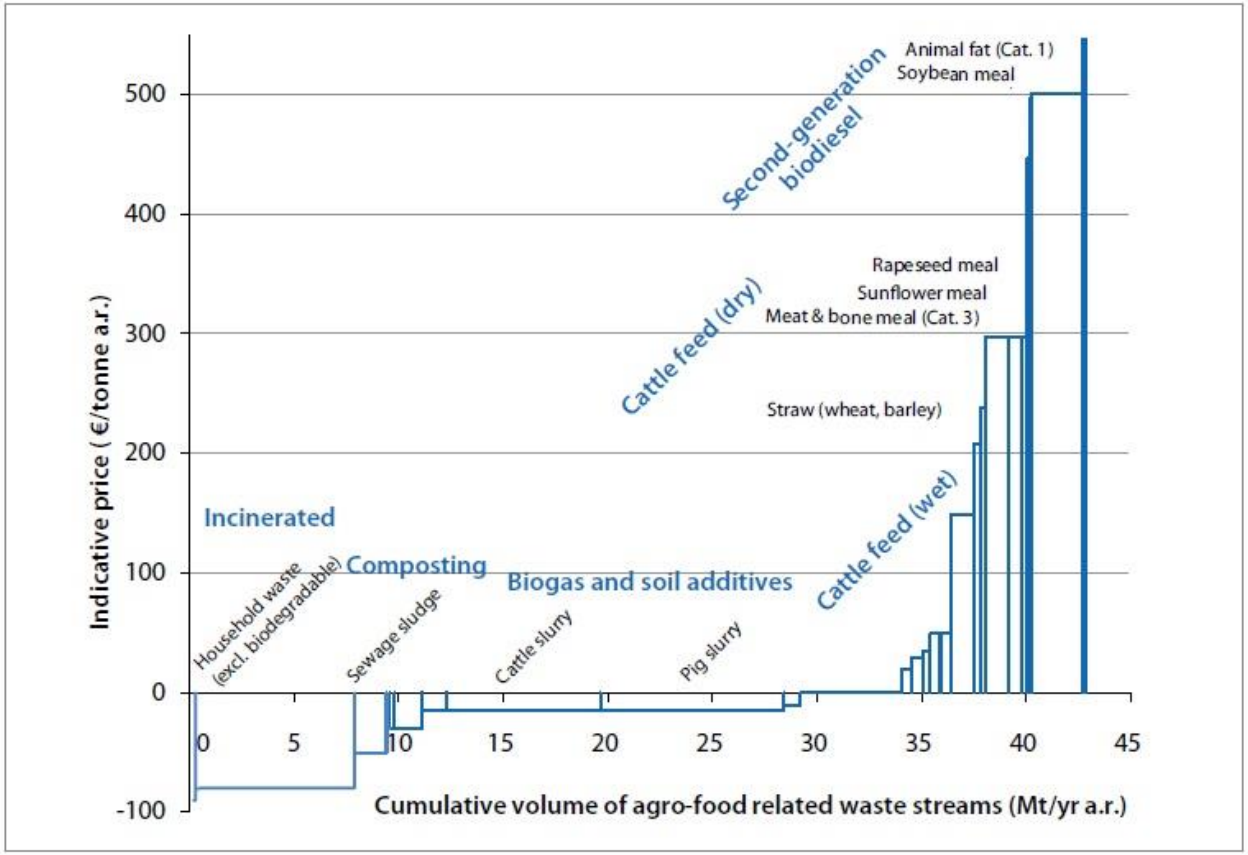
- New business
- New markets
- New revenue streams

….with frontrunners.

New entrepreneuring….

- **Sector response - Building trust**
  - Awareness - marketing approaches
  - Reporting and sharing of best practices
  - Training and capacity-building
  - Joint R&D - LCA
  - Unify certification schemes and standards
    - Including social values
    - Develop widely accepted label
    - Avoid "green washing"
- **Chain action - Leverage partnerships**
  - Clear benefits - shared objectives - LCA
  - Involve different affiliations - mutual trust
  - Joint / Coordinated R&D

NL: Current recycling of bio-waste ≈ 3.5 Bn€/y

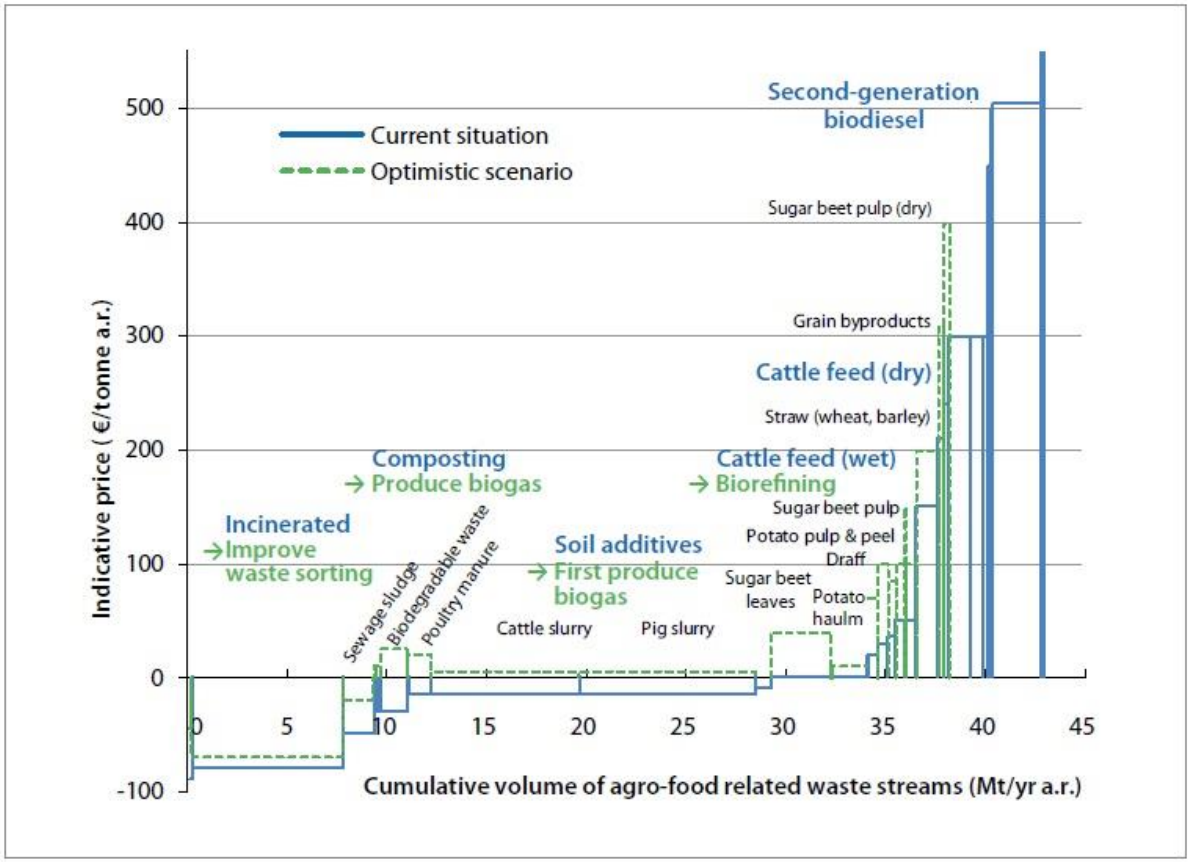


… possible additional cumulative value ≈ 1 Bn€/y

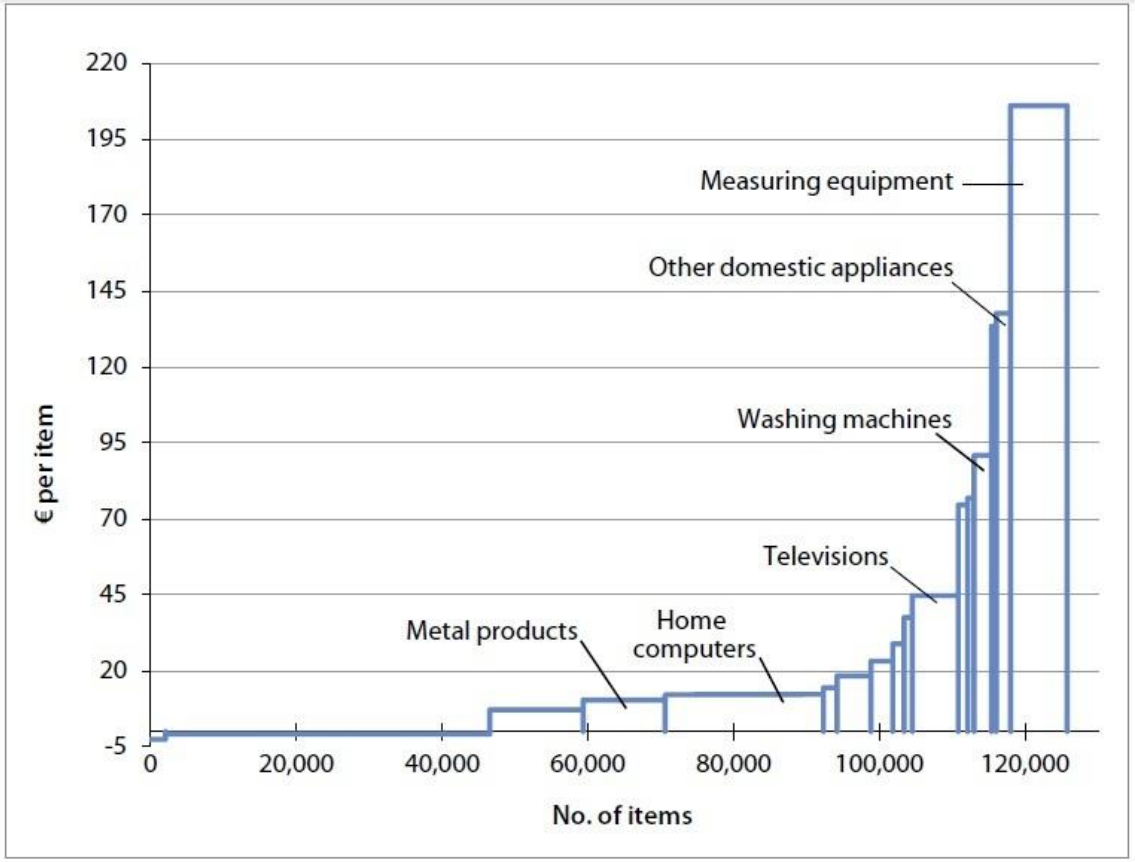
in NL

from:
- cattle slurry
- sugar beet waste
- sewage sludge

Investments:
4 – 8 Bn€



NL: Present value recycling metal-electro ≈ 3.3 Bn€/y

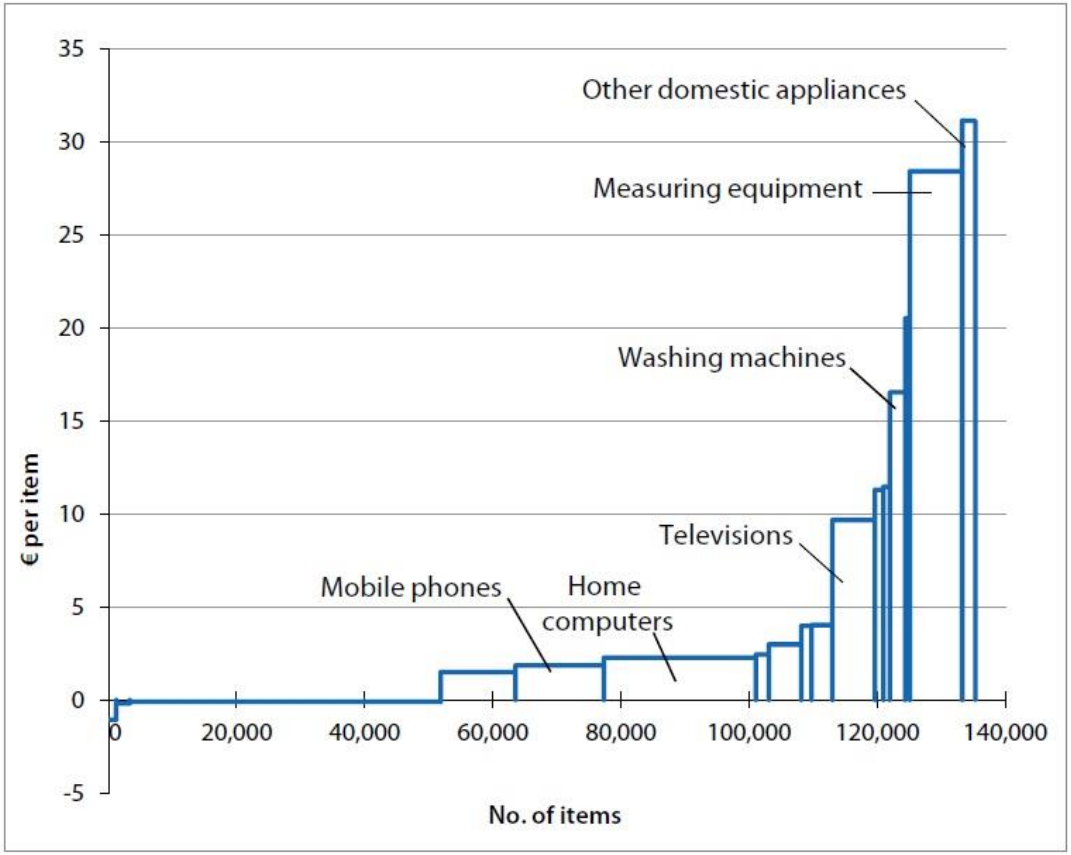


…. Additional cumulative value of recycling – metal-electro ≈ 960 Mn€/y

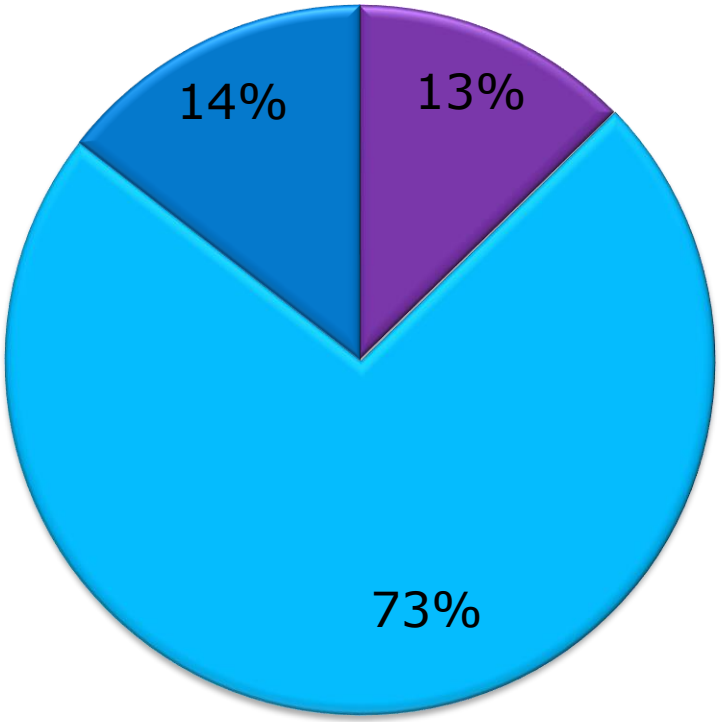
in NL

…. But less new sales ≈ 390 Mn€/y

= 570 Mn€/y additional value



Extrapolation to entire NL economy



+ 7.3 Bn EUR

+ 54,000 jobs

External effects due to CE in NL

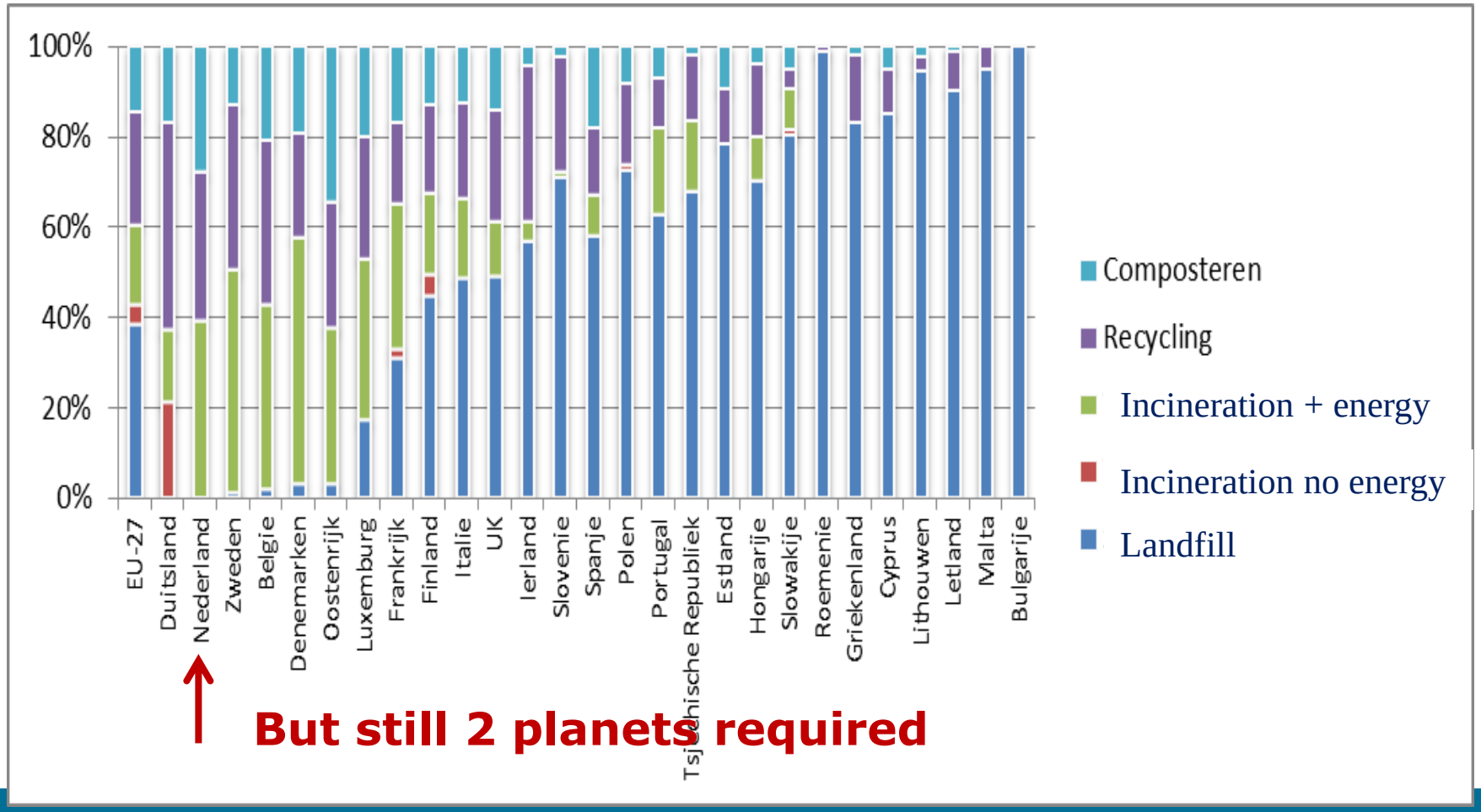
Direct

- - 10 % CO2 emissions from economic activities
- - 2 % land-use
- - 20 % industrial use of fresh-water
- - 25 % of total NL goods imports

Indirect

- Economic resilience to raw materials scarcity
- New product design and markets
- Export of new technologies
- Innovation in recycling sector
- Innovation in logistics sector
- New economic activity

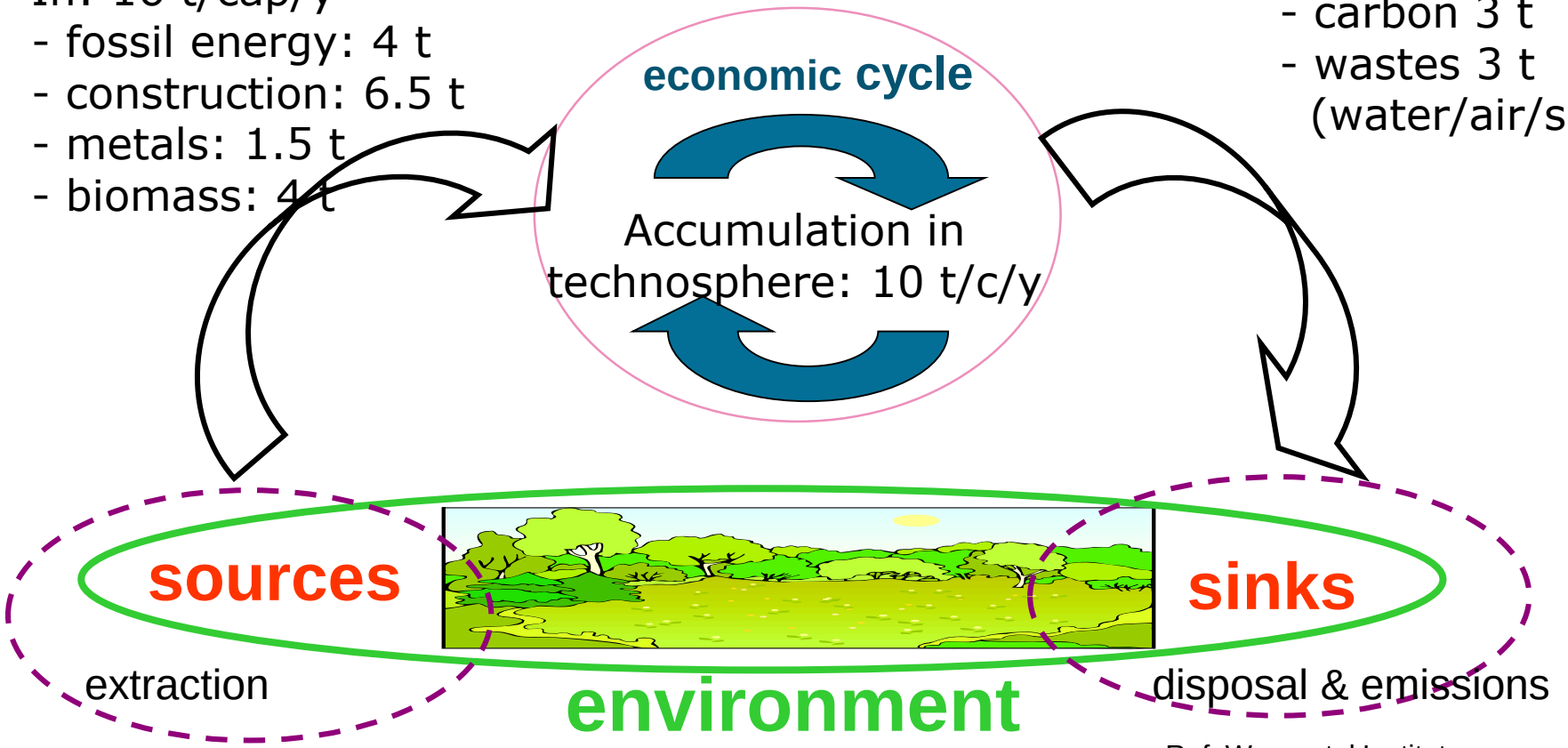
Landfill, recycling and incineration of municipal solid waste – NL among top recyclers



Materials flows - EU

In: 16 t/cap/y
- fossil energy: 4 t
- construction: 6.5 t
- metals: 1.5 t
- biomass: 4 t

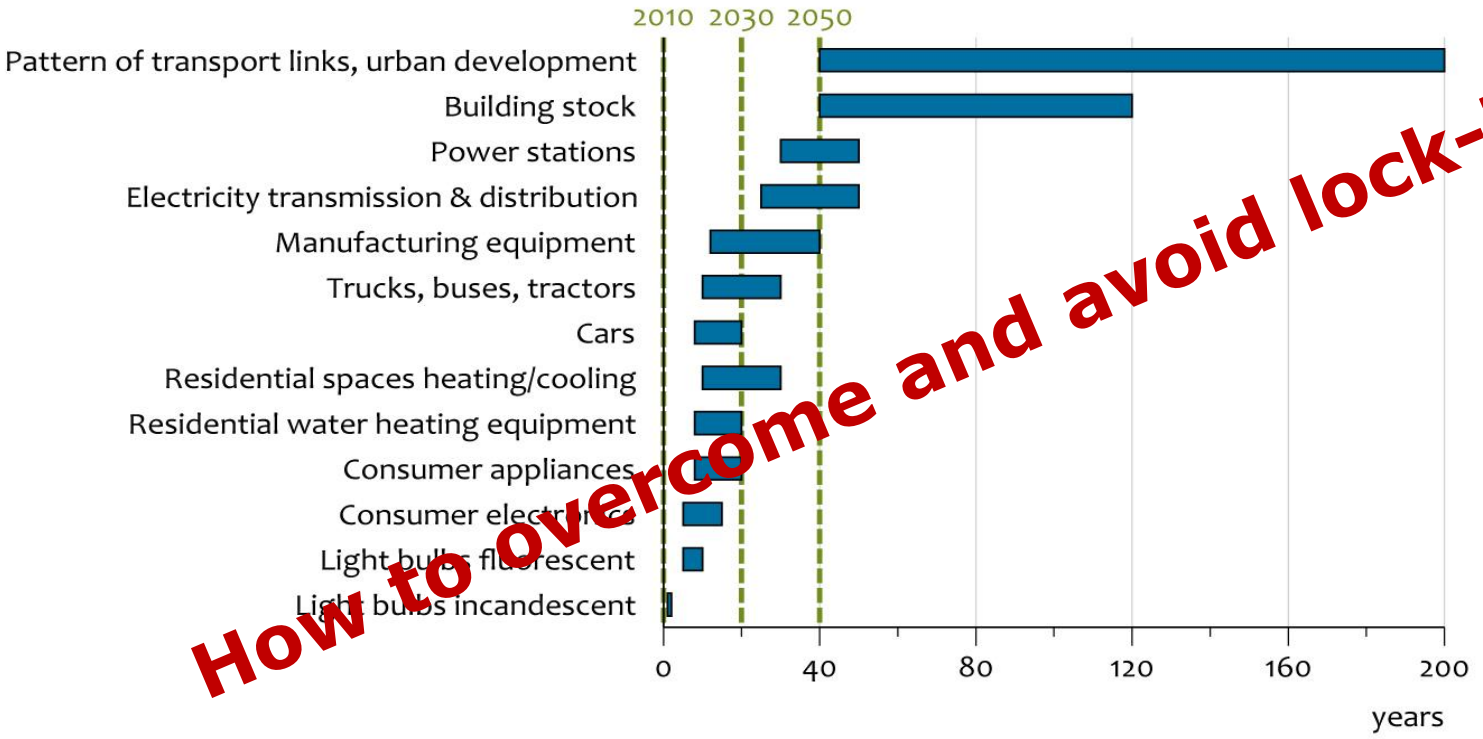
Out: 6 t/cap/y
- carbon 3 t
- wastes 3 t
  (water/air/soil)



Ref. Wuppertal Institute

System inertia is one of the links between long-term vision and near-term investments

Energy capital lifetimes



How to overcome and avoid lock-ins ?

Source: Philibert and Pershing, 2002

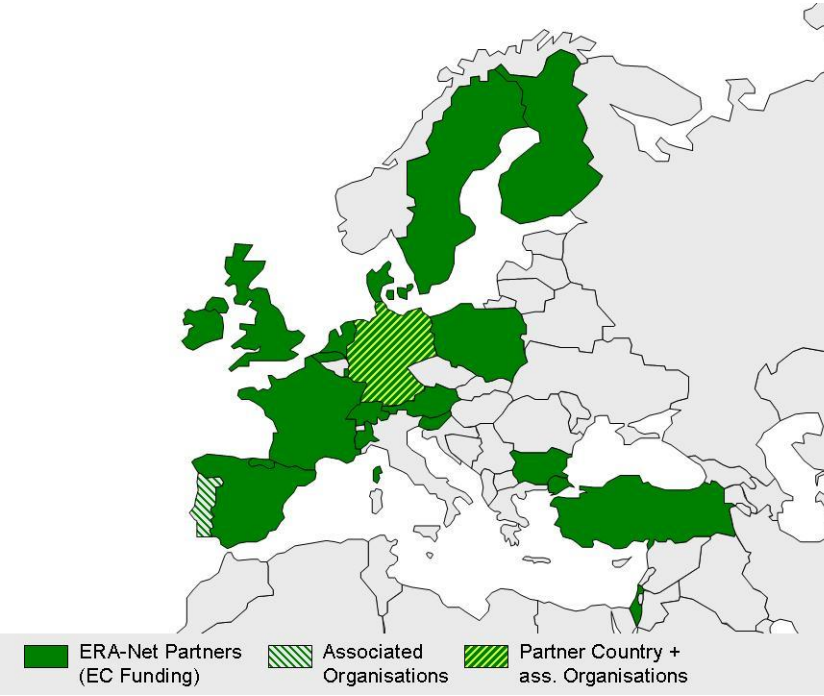
Boosting eco-innovation through cooperation in research

ECO-INNOVERA

25 partners

15 countries + 3 regions

Organizations from research, environment, and economy



Eco-Innovera suggests Systemic Eco-Innovation

- Cross-cutting activity, distinctive from any other ERA-Net
- Topical subject for policy, business and research
- Distinctive from eco-innovation business-as usual
- Potentially achieves deeper levels of innovation faster
- Speed up innovation and have more impact on society
- Interest to research funding

Why Systemic ?

- Accumulation of business critical issues, e.g. resource shortages, sustainable sourcing, climate change impacts, waste water, air quality, chemicals management
- Too big and too complex to tackle alone
- Companies need to engage beyond their borders, up their supply chains and down the value chain
- Often societal/cultural and knowledge barriers
- Governments need collaboration with and support from business

Systemic Eco-Innovation

A set of innovations (new approaches or new applications that scale) that lead to a shift in a whole system (a sector, a city, an economy) on to a more sustainable or better ecological path.

Interdisciplinary, multi-faceted: *combining behaviour, technology, policy and economy*

Radical, transformative: *creating significant change, using new approaches and applications*

Collaborative: *cross-sector, involving different players, new types of partnerships, shared vision*

Changing whole value chains and business models

Taking place in a wider societal context

Examples of Systemic Change

- From horse-and-carriage to individual car-mobility
  to mobility services
- From extensive to intensive agriculture
  to urban farming
- From polluting industry to eco-parks
  to combined working & living
- From individual washing machine
  to centralized washing facilities
  to self cleaning clothing
- From manufacturing and owning
  to access and use

Technology
Enterprises
Governance
Policy
Science
Education
Culture

Barriers to Systemic Innovation

- Value of recyclables too low - Predictable quality/quantity
- Competing waste treatment
- Legislation on (imports of) waste materials
- Culture change in companies
- Cooperation with stakeholders in the chain
- Sustainable sourcing unknown/uncertain

- ➢ Re-invention and design-for-repair/re-use/upgrade unwanted
- ➢ New business models unknown/uncertain
- ➢ Lack in education & training & research
- ➢ Risky investments
- ➢ Social acceptance is doubtful
- ➢ **Who takes the initiative?**

Towards systemic eco-innovation

Tools in legislation

Supporting Green Economy / Industrial Symbiosis

- Knowledge on material-flow-analysis
- Knowledge on supply–use-storage
- Raw materials passport and database
- New business models for CE
- Networks for IS

& new tools and partnerships

New tools in support of Systemic Eco-Innovation

- Function-based R&D
- Integrating technology, ecosystem, and society
- Transition management (process, partnership, diversity, experiments, competition)
- Mobilize the "motors-of-innovation"
- **New LT strategic vision open for change**

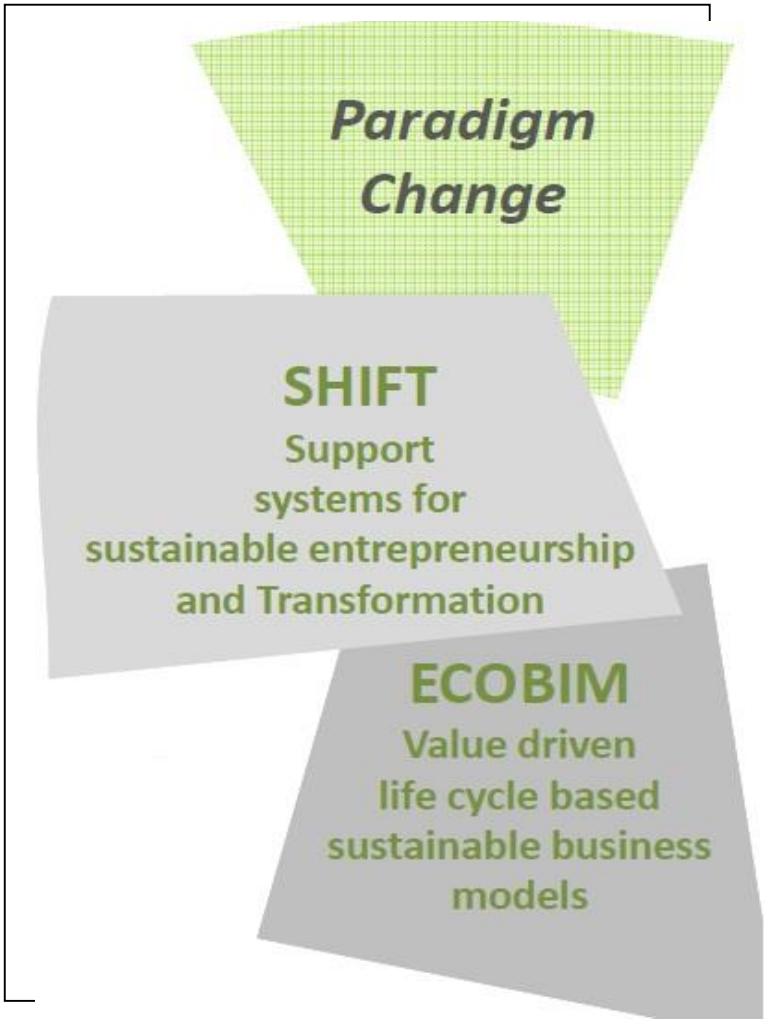
Eco-Innovera calls–for–tender 2012-2013

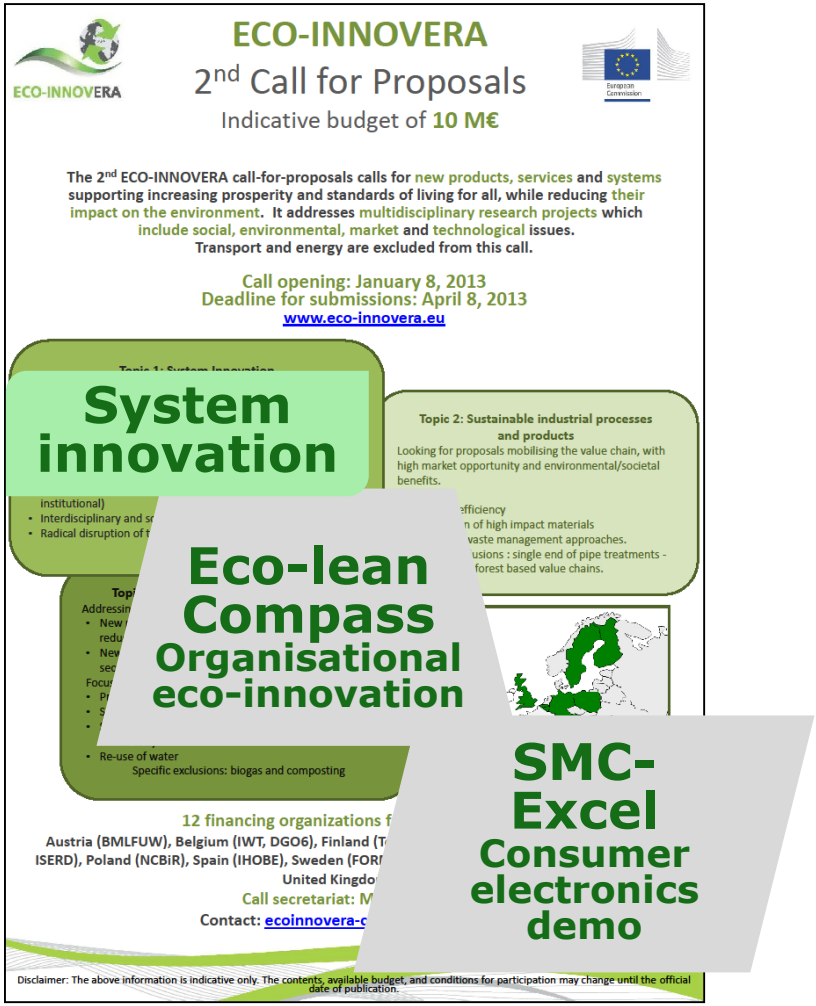
Systemic Innovation:

- Function-based rethinking/reinventing/redesign
- Different models of production and consumption
- Major business opportunities for novel, transformative approaches to supplying goods and services

- With focus on:
  - New supply chains/substantial reconfiguration of existing supply chains - Radical disruption of the economic model
  - Multiple innovations with large diversity
    (mixtures of technological/societal/institutional)
    (mixtures of diverse approaches and resolution-strategies)
  - Interdisciplinary and socio-economic contributions

Eco-Innovera calls–for–tender 2012-2013





Research →Application → Pilot → Market-Replication → ……..

In FP7:

- Impacts in economy, science, behaviour
- Growth and jobs
- Life-cycle approaches; resilience
- Behavioural change, user engagement
- Multidisciplinary consortia:
  - industry, SMEs, human sciences
- Dissemination
- Society driven (EIPs, JPIs, JTIs, ETPs, ...)
- Paradigm change

In H2020:

- Increase RE
- Circular economy
- Energy efficient economy
- Transition through eco-innovation
- Business models, industrial symbiosis
- Product service systems, redesign C2C
- Behavioural science
- Networking, demo, user driven
- Systemic approaches

Key notions

System ambitions and inertia

- Challenges require new approaches and massive acceleration by 2020-2030 to reach sustainability targets
- Interim solutions 2020-2030 may easily create lock-in
- Diversity as a strategic aim
- Function-based redesign has potential
- and potentially threatens vested interests.
- Focus and flexibility by 2050 needs vision, strategy, planning and resources
- Operating space for research, policy and entrepreneurs

Final Conference ECO-INNOVERA

Boosting Eco-Innovation
through Co-operation in Research and Development

17th and 18th of September 2014

Eigtveds Pakhus Conference Centre
Copenhagen, Denmark

https://www.eco-innovera.eu/final-conference

Ministry of Infrastructure and the Environment of the Netherlands

Robbert Droop

robbert.droop@minienm.nl

http://www.government.nl/issues/environment/documents-and-publications/reports/2013/10/04/opportunities-for-a-circular-economy-in-the-netherlands.html

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Coordinator: e.echeverria@fz-julich.de
www.eco-innovera.eu