Solid Waste Management – Learnings from the Netherlands

Knowledge Sharing Session – LDE and ADB – 21 May 2024, 3-4 pm

Universiteit Leiden
The Netherlands

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Leiden-Delft-Erasmus Centre for Sustainability

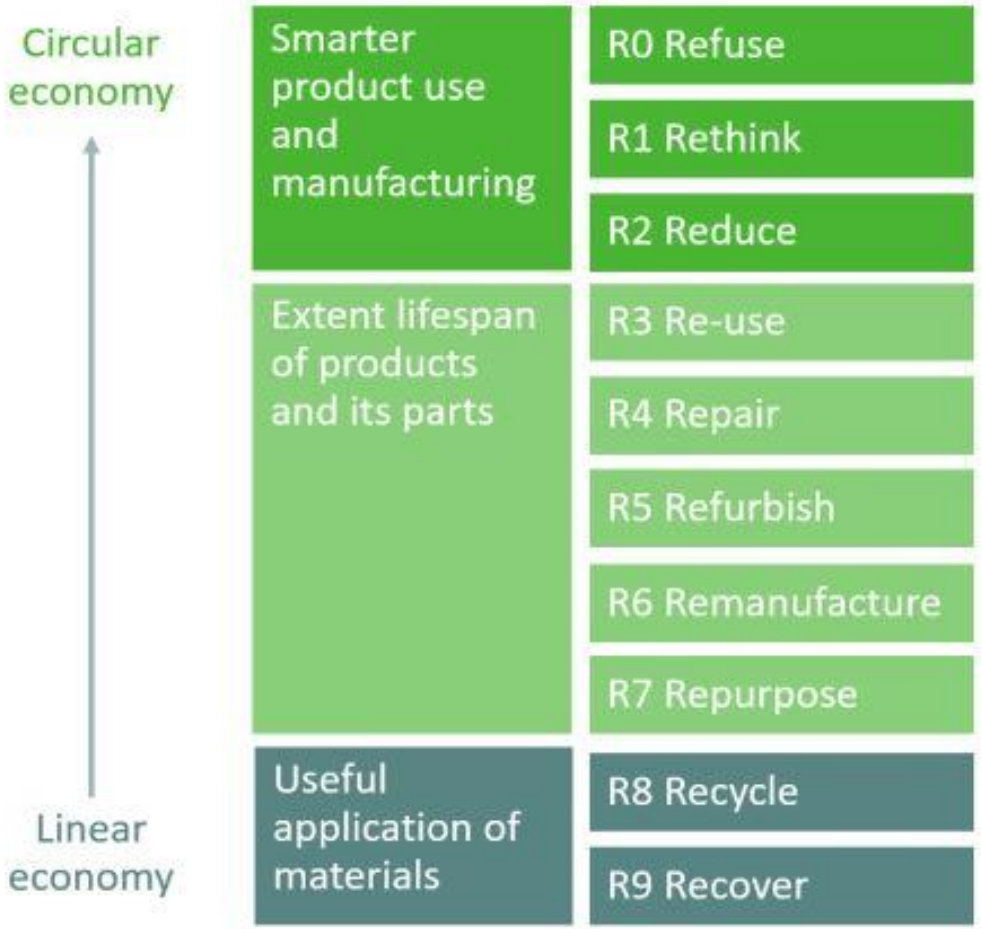
Focus: Research & Education

Environmental-economic system analysis (Leiden)	**Business models (EUR)**
Technology & design (TUD)	**Governance, regulation & transitions (All)**

Application: innovation with practice

- **Circular industries**
- **Cities and regions**
- **Agro-food**

https://www.centre-for-sustainability.nl/home



Paris becoming a bicycle instead of car city

Brick re-use after WWII, Germany

Building waste granulate for road foundation (downcycling)

Waste to energy

But you have to start somewhere - waste management development in NL

- **1970's – few laws and policies, no enforcement ->**
  - illegal dumping
  - investment in treatment not profitable
  - Leading to soil pollution scandals putting a high pressure on government

- **1980s – waste laws, start of planning and enforcement**
  - State support for building hazardous waste incineration (too risky for industry)
  - Waste management planning
    # Waste hierarchy became leading (prevention, re-use, recycling, incineration, landfill)
    # Per waste stream minimum quality standards for treatment – otherwise no permit
    # (Initially) stringent capacity planning to avoid overcapacity for e.g. incineration)
    # Extended producer responsibility
    # Economic incentives making incineration and landfill expensive (taxes)
  - Enforcement program

Waste management development in NL

- **1990s – strategic waste programs on prevention and re-use**
  - Identification of priority wastes (e.g. building and construction, electronics, packaging, plastics)
  - Targets for reduction and re-use set by government, backed by parliament
  - Roundtables with industry on HOW to realise these targets -> support policies per waste stream (e.g. deposit system for cars, electronics)
  - As indicated, **Extended Producer responsibility** was crucial (funds collection and recycling), next to generic **taxes** on landfill

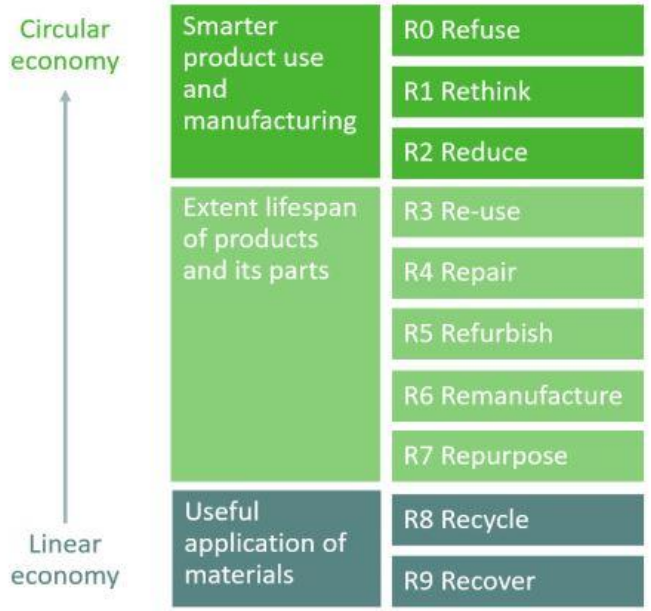
- **Result:**
  - We went down from 35% landfill in 1985 to 2-3% now
  - With 77% recycling, Netherlands is best in class in Europe
  - Including waste to energy we have no 93% recovery

- **We must now make the step from recycling to circularity**

However, we still have problems

- **Waste to Energy and down-cycling is not a circular economy**

- **We dropped capacity planning end 1990s**
  - Like in normal markets, entrepreneurs would take risks of creating overcapacity
  - Too many incinerators were build
  - Incinerator owners now import incinerable waste from other countries
  - There is a serious risk that prevention and re-use is frustrated to fuel the hungry incinerators



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What is the difference with other countries?

- **My other experiences**
  - Ireland (1996-1998)
  - Argentina (1998)
  - Circular electronics ToR for Swiss Ministry of Development Aid for Africa and Asean countries (2024)
  - Work in many other countries including Indonesia, China, Thailand

- **What we typically see: a low level of maturity at all levels**
  - (1) Institutional, Policy and Legislative Framework
  - (2) Normative requirements and verification/enforcement mechanisms
  - (3) Professionally functioning collection and treatment system
  - (4) Adequate waste volume monitoring

What could be solutions?

- **Use creative and low-investment solutions**
  - Cement kilns for incineration of certain high calory waste
  - See what the informal sector does right and how you can improve that

- **Extended producer responsibility can solve a lot**
  - Funding of (1) Policy institutions (2) Enforcement (3) Collection and Treatment and (4) Monitoring
  - Particularly internationally working producers are used to this in other countries and generally are sensitive to be seen as compliant with initiatives of actors like UNEP, the EllenMacArthur Foundation, and so on

- **Seems largely a governance problem, not a technical problem and only in part an investment problem**

What are important priorities?

- **Get some of the basics right (controlled collection, landfill)**

- **Key waste streams may include**
  - Plastics
  - Waste of Electrical and Electronic Equipment
  - ..

Some relevant programs at LDE

- **Academic MSc and PhD programs**
  - MSc Industrial Ecology (Leiden & TU Delft: environmental-economic system analysis)
  - MSc Integrated product design (TUD, circular design)
  - MSc Global Business and Sustainability (EUR, business perspective)
  - MSc Governance of Sustainability (Leiden: policy & governance)
  - MSc Societal Transitions (EUR: transition management)

- Interdisciplinary and transdisciplinary integration
  - **Interdisciplinary thesis labs** – students from different MSc's work jointly on the same problem (e.g circular hospitals; circular aerospace, etc.)
  - **Transdisciplinary projects** – e.g. 20 companies, 5 universities with 8 PhDs on circular electronics

What capacity development can we support?

- Various excellent universities doing waste related work including
  - KMUTT, Bangkok;
  - deLaSalle, Manila;
  - UNPAD, ITB, Universitas Indonesia, Indonesia
  - Tsinghua, CAS, Chinese Agricultural University, China;
  - and many more
- What can we do?
  - Twin LDE and Asian partners in the field of education and research
  - Support ADB with integrated socio-economic/environmental sustainability assessment (key strength of LDE)
  - Networking

Some practical ways of twinning

- Twinning education:
  - Minor sustainable development practice block in January: 10 NL students, 10 Asian students at Asian host university (we did this in the past with UI in Indonesia and Isabella State University in the Philippines)
  - Support MSc thesis exchange
  - Interdisciplinary thesis labs (MSc thesis students from different programs work on a common subject; graduate in the own education program; we do this nationally now; need funding for additional supervision)
  - Hosting MSc students (e.g. paid by Erasmus Mundus)
  - Support in co-developing BSc and MSc programs with regional University staff ('Design week'; 'Master class')

- Twinning research:
  - Hosting guest PhDs from Asia on joint projects (e.g. with a national stipend from CSC or LDPD)
  - Joint research programs/projects (often a bit complex – EU does not fund outside EU)
  - Organising one week Summer / Winter schools with regional University staff / PhDs
  - Setting up PhD programs with Asian partners alongside major investment projects (e.g. Nusantara, Indonesia)

Thanks for your attention!

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Other options for collaboration?

- Development of innovative assessment methods
  - LDE is very strong in environmental-economic accounts, scenario planning, dynamic modelling
  - Working along with ADB and national partners on innovative models for integrated socio-economic and environmental assessments is very interesting

- Networking
  - Twinning LDE with local partners we know well
  - Also beyond LDE – I am president-elect of a main scientific society in socio-economic and environmental-assessment methods, the International Society of Industrial Ecology (ISIE)
  - ISIE is having its next main conference in Singapore in June 2025