“Transition towards a circular economy from a business perspective

Jacqueline Cramer
Ambassador Circular Economy
• Growth of world population and increase of consumption and production lead to growing scarcity of some key resources, more volatile prices and severe environmental impacts

• Increasing concentration of world population lives in urban regions: 1950 30%, by 2050 66%
We move from a linear economy... ...To a circular economy
1. Water as a resource

Four aims:

1. Safeguarding security of water provision, water quality, safe/healthy drinking water
2. Adaptation to climate change
3. Closing water cycles
4. Establishing relation between water use and use of energy, nutrients and waste streams
2. Energy as a resource

Aim:

To combat climate change and guarantee security of energy supply by:

- Energy-efficiency measures
- CO$_2$ reduction, Carbon Capture, Storage and Utilization
- Renewable energy: solar- and windenergy, ATES, geo-thermal, bio energy, surplus heat, hydrogen and other energy sources, combined with smart grids and new energy infrastructure
3. Raw materials as a resource

Aim: to reduce scarcity and environmental impact and increase security of supply
This generates direct financial benefits...

- **USD 380-630 billion/yr** cost savings in EU¹
- **7.3 billion EUR/yr** market opportunities in the Netherlands²
- **83,000** potential extra jobs in the Netherlands³
- **2.9–3.7 trillion USD** in 2030 by increase of resource productivity worldwide⁴

... But also indirect benefits

- Improvement of security of supply
- Development of new knowledge
- Trigger for innovation and new businesses
- Decrease of environmental burden

---

1. E. MacArthur Foundation
2. TNO
3. Rabobank
4. McKinsey
Learning: precondition for change and innovation

- **Single-loop learning**: acting within the *existing* business practice, policies and standards
- **Double-loop learning**: critical reflection on fundamental values, policies and operational procedures (Argyris & Schön, 1996)
Change-processes at local, regional, national, European and global level
Netherlands: One of the frontrunners

2016: Nationaal programme Circular Economy: The Netherlands circular in 2050

- Cooperation; chain/sector approach
- Interventions
- Biomass/food; building sector; plastics, consumption goods and manufacturing industry
Transition management
(Geels, 2002; Loorbach & Rotmans, 2006)
• All relevant actors should be included
• Multi-level perspective
• Long term objectives attuned to short term actions
• Room for experimenting and learning
• Involvement of frontrunners
• Joint, coordinated effort to build a new, circular economy
Two main implementation strategies

1. Green deals and Sector agreements (private initiatives or public-private partnerships)

1. Regional/municipal initiatives
Example: Concrete Agreement about 300 partners will sign
CO$_2$-reduction: 49% (2030)
Circularity: 100% (2030)
Natural capital: net positive value
The Metropolitan Area Amsterdam

The mission is to be frontrunner in finding smart solutions for the limited availability and overconsumption of resources. At the same time we realize employment, innovation and new businesses.

Scale: action required at the scale of the Metropolitan Area of Amsterdam

Synergy: action relevant for companies, regional governments, knowledge institutes and citizens

Densely populated area (2.3 million people)
There are different barriers for radical change

- Institutional (vested interests)
- Organizational (no coordination)
- Legal (legislation hampers innovation)
- Economic (focus on current business models; external costs not included in prices)
- Behavioural (reluctance to change attitude)
- Technical (incremental innovations prevail)
Levels of circularity: 10 R’s

Order of priority

High

- **Refuse**: prevent raw materials use
- **Reduce**: decrease raw materials use
- **Renew**: redesign product in view of circularity
- **Re-use**: use product again (second hand)
- **Repair**: maintain and repair product
- **Refurbish**: revive product
- **Remanufacture**: make new product from second hand
- **Re-purpose**: re-use product but with other function
- **Recycle**: salvage material streams with highest possible value
- **Recover**: incinerate waste with energy recovery
Redesign: through redesign products can be brought back into the cycle with high value creation
Many ways to reintroduce a product in the economy

- Repurpose
- Redesign/reuse
- Repair
New business models are also being developed: sharing and leasing redefine product ownership.
Circular procurement can help stimulate circular products

Targeted approach

- Choose 2-3 procurement initiatives to start with and expand this number the coming years
- Include as launching customer 1-2 startups in your approach
- Anchor this approach in the structure and culture of your organization
Ladder of circularity: the MRA gives priority to the options that are as high as possible on the ladder

Levels of circularity

High
- Refuse
- Reduce
- Redesign
- Re-use
- Repair
- Refurbish
- Remanufacture
- Re-purpose

Low
- Recycle
- Recover (energy)
The MRA has started with high value recycling of 9 priority resource streams

- Biomass
- Construction- and demolition waste
- Electronic and Electric waste
- Mattresses
- Metals
- Servers of ICT sector
- Non wearable textile
- (Incontinence) diapers
- Plastics
The approach of material streams is tailor-made

**Collection of insights**

- Insight in current situation on the basis of meetings with experts and documentation

**Brainstorm about solutions**

- Brainstorming sessions about high value recycling of material stream

**Consultation of the market**

- Market consultation about business interest and (if needed) support of government and other parties

**Design of action-plan**

- Design of action-plan aimed at implementation
High value recycling needs the appropriate scale

Municipal level

Regional level
Case 1: Circular demolition and construction in Amsterdam West of 470 houses: local

95% resource reuse; climate neutral, green
Case 2: high value recycling of biomass stream
Biodegradable household waste, sewage-sludge, agro-food, public greenery and waterplants
Example: High value recycling of waste streams from the food industry (multipurpose biorefinery): sub-regional
Example: High value recycling of public greenery: sub-regional
Production of resources for the paper- and chemical industry
Case 3: Textile recycling (non wearable): regional
Case 4: Closing the loop of plastic waste: supraregional
Case 5: Electronic/Electric waste: subregional (dismantling) and regional (recycling)
Case 6: Incontinence materials/diapers :regional
Case 7: Metal recycling: regional
Case 8: Servers of ICT sector: regional
Case 9: Closing the loop of mattresses: national
Closing the loop at regional level is tailor-made, but there are 7 generic preconditions for change

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proper balance</strong></td>
<td>Finding a proper balance between closing loops at local or higher level</td>
</tr>
<tr>
<td><strong>Decrease of incineration</strong></td>
<td>Attuning decrease of incineration and development of circular activities</td>
</tr>
<tr>
<td><strong>Sufficient supply and clear demand</strong></td>
<td>Taking care of sufficient supply to be recycled and clear demand for recycled material</td>
</tr>
<tr>
<td><strong>Quality of product</strong></td>
<td>Securing the quality of product use and recycling</td>
</tr>
<tr>
<td><strong>Legal &amp; technical barriers</strong></td>
<td>Taking away legal and technical barriers</td>
</tr>
<tr>
<td><strong>Lack of coordination</strong></td>
<td>Orchestrating and communicating the transition process towards circular economy</td>
</tr>
<tr>
<td><strong>Financial/organisational innovations needed</strong></td>
<td>Developing and applying new financial and organisational arrangements</td>
</tr>
</tbody>
</table>
The Amsterdam Economic Board is a cooperation between regional governments, companies and knowledge institutes.
Key objectives for 2025

- Improving security of supply of resources by reducing the import of raw materials with 30%
- Redesigning min. 20 product-/material chains
- High value recycling of at least 40 priority resource streams (on average: recycling rate of 90%)
- Creating at least 3600 new jobs, 150 start-ups and 480 million extra turn over
- Decreasing environmental burden by 35% average
Think global, act local