Circular Economy

Innovation and Partnerships for Inclusive and Sustainable Industrialization

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Our cities!
Our waterways and oceans!
In today’s economy

• **65 billion tons of raw materials per year** (22kg/person/day) are extracted, harvested and used

  - Only 7% of these materials are reused or recycled
    - About **8 million tons of plastics** enter the oceans every year
    - **300 tons of gold** is buried in **50 million tons of electronic waste every year**

• **40 % of GHG emissions** are attributable to materials management

• **Waste of**
  - Resources
  - Economic value
  - Business opportunities
  - Environment as a resource: Soil / water / air
Our world!
Our consumption? heaps of, often, toxic waste!

That’s one small step for man

And one giant heap left behind!
Our production? eliminate planned obsolescence

- Frequent cosmetic changes in products
- Non-durability a feature
Our products? difficult to disassemble, repair, reuse, recycle!

Disassembly from 3 to 20 minutes, **with special tools**
Innovation: design for disassembly (DfD)

Less than 10 seconds by hand!
Innovation: substitute critical or hazardous materials
Innovation and partnerships: remanufacturing in South Africa

- Automotive industry in the country
  - produces over 600,000 vehicles per year;
  - supplier employment in 2014 was 80,000,
  - parts and components exports to EU, Africa, US, Brazil, Japan, Australia, South Korea, India and China

- Engines for major brands such as Toyota, Ford, VW, GM, Audi, Chevrolet, Isuzu, Opel, Mazda, Nissan and Land Rover
- Alternators, invertors, starters, compressors, etc.

Probe re-manufactured, approved replacement parts and the highest quality approved repair facility
Innovation and partnerships: the value chain
Innovation and partnerships: digitalization

A digital eco-system that multiplies value

Developing a platform for digital machining that brings true value isn’t something you do on your own. Connectivity builds on interoperability with the industry around you, meaning open APIs*, standards and partnering up.

The Sandvik Coromant network consists of partnerships across CAD/CAM, machine tool makers, logistics, network and cloud. The product of these interconnected partnerships: increased value for you.

*Application Programming Interface
Innovation: GEF-UNIDO Global CleanTech Innovation Programme

Green building materials
Innovation: GEF-UNIDO Global CleanTech Innovation Programme
Innovation: cleaning up recycling in craft villages

Reduce open burning in the plastic recycling craft villages of Phan Boi and Minh Khai by introduction of Best Available Technologies (BAT) and Best Environmental Practices (BEP)
RECPnet members help produce more efficiently since 1994

65 independent
Resource Efficient
Cleaner Production centers
in 50 countries

www.recpnet.org
Innovation and partnerships: Circular economy of the Coffee husk

Coffee sector generates large amount of by-products, mainly coffee pulp

Current pyrolysis systems...

Traditional Production (Charcoal)  Industrial Production

... are not appropriate and/or too expensive for tropical farming

New pyrolysis technology, a climate positive Technology

- is affordable
- is compliant with international quality standards
- is scalable for big producers & small farmers
- can be integrated in existing drying systems
Innovation and partnerships: Circular economy of the Coffee husk

Coffee sector

Pyrolysis Technology

- The technology meets EU emission standards for burners:
  - A constant heat source allows obtaining better coffee quality and less coffee waste
  - Coffee hard shells used for compost production
- Pilot projects in 2 sites in Viet Nam
- Upscaling the dissemination of the technology in Vietnam and the region with the private sector (Neumann Group, Nestlé, etc.)

Public-Private Partnership for innovation facilitated by UNIDO
Innovation and partnerships at Eco-Industrial Parks

Company level

Individual RECP solutions

- Resource Efficient Cleaner Production (RECP):
  - Materials efficiency
  - Water efficiency
  - Energy efficiency

Industrial Park level

Collective RECP solutions

- Operation & Management of:
  - Common Infrastructures
  - Resource Supply (Water, Energy, Materials)
  - Environmental & Social Services

City level

Urban Symbiosis

- Waste Management
- Recycling industries
- Corporate Social Responsibility

Inclusive and sustainable industrialization and sustainable cities
Viet Nam Industrial Zones moving towards Eco-Industrial Parks

- Reduced use of water (20%) 6 million m³ per year
- Minimized GHG emissions (182,000t per year)
- Reduced release of U-POPs (90%) 2.43 g/a TEQ
- Reduced wastewater pollution (COD, BOD, TSS)
- Shared environmental infrastructure
- Improved competitiveness and profitability
- Higher-quality jobs created
- Improved workers health and safety
- Increased quality of life for communities
- Better access to new technologies and finances

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<tr>
<th>Industrial Zone</th>
<th>Province</th>
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<tr>
<td>Khánh Phú</td>
<td>Ninh Binh</td>
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<tr>
<td>Hòa Khánh</td>
<td>Đà Nẵng</td>
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<td>Trà Nóc 2</td>
<td>Cần Thơ</td>
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An international framework for Eco-Industrial Parks (EIP)

Joint work

Time-line of collaboration

2013  2014  2015  2016  2017
EIP Performance assessments

- **Colombia:** 2 Industrial parks
- **Morocco:** 2 Industrial parks
- **Senegal:** 1 Industrial park
- **Mauritania:** 1 Industrial park
- **South Africa:** 2 Industrial parks
- **China:** 2 Industrial parks
- **Viet Nam (joint):** 4 Industrial parks
- **India:** 4 Industrial parks
- **Bangladesh:** 1 Industrial park
- **Turkey:** 4 Industrial parks
- **Ethiopia:** 4 Industrial parks
- **Morocco:** 2 Industrial parks
- **Senegal:** 1 Industrial park
- **Thailand:** 3 Industrial parks
- **Bangladesh:** 1 Industrial park

Total: 35 IPs
To implement circularity

Through **systemic** interventions, so as to reap the **environmental, economic and social benefits for inclusive and sustainable industrialization**, we need **innovations and partnerships**, and a **joined up agenda** among:

- Developed, developing and transition economies
- Policy and decision makers at international, national and sub-national levels
- Public and private actors
- Research, academic, education and training, technical and support institutions
- Society at large

Thank you for your attention

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