# Eco-innovation and Industry 4.0

Sooksiri Chamsuk

UNIDO Regional Office in Thailand


9. Eco-friendly Chair


method
ALL-PURPOSE
method
GLASS + SURFACE
method
DAILY CLEAN
method
BATHROOM CLEANER
method
DAILY GRANITE


recover
100% recycled apparel


grace
simple
RB004


โฟม อายุ 1,000 ปี
พลาสติก อายุ 450 ปี
แล้วคุณ อายุเท่าไร?
grace

# Eco-innovation: Concept

" the production, assimilation or exploitation of a novelty in products, production processes, services, or in management and business methods, which aims, throughout its lifecycle, to prevent or substantially reduce environmental risk, pollution and other negative impacts of resource and energy use", OECD 2008

Innovation is the introduction of a new product, production process, organisational changes or developing a new source of supply for raw materials/inputs. It may involve the opening of new markets and/or new market structures in an industry.

(Schumpeter, 1934; OECD Manual, 2005)

# Eco-innovation: Concept

- Eco-innovation
  - emphasizes on a reduction of environmental impact whether by intention or not; and
  - Includes changes in social norms, cultural values and institutional structures

(Machiba, 2010)

# Eco-innovation and sustainable manufacturing

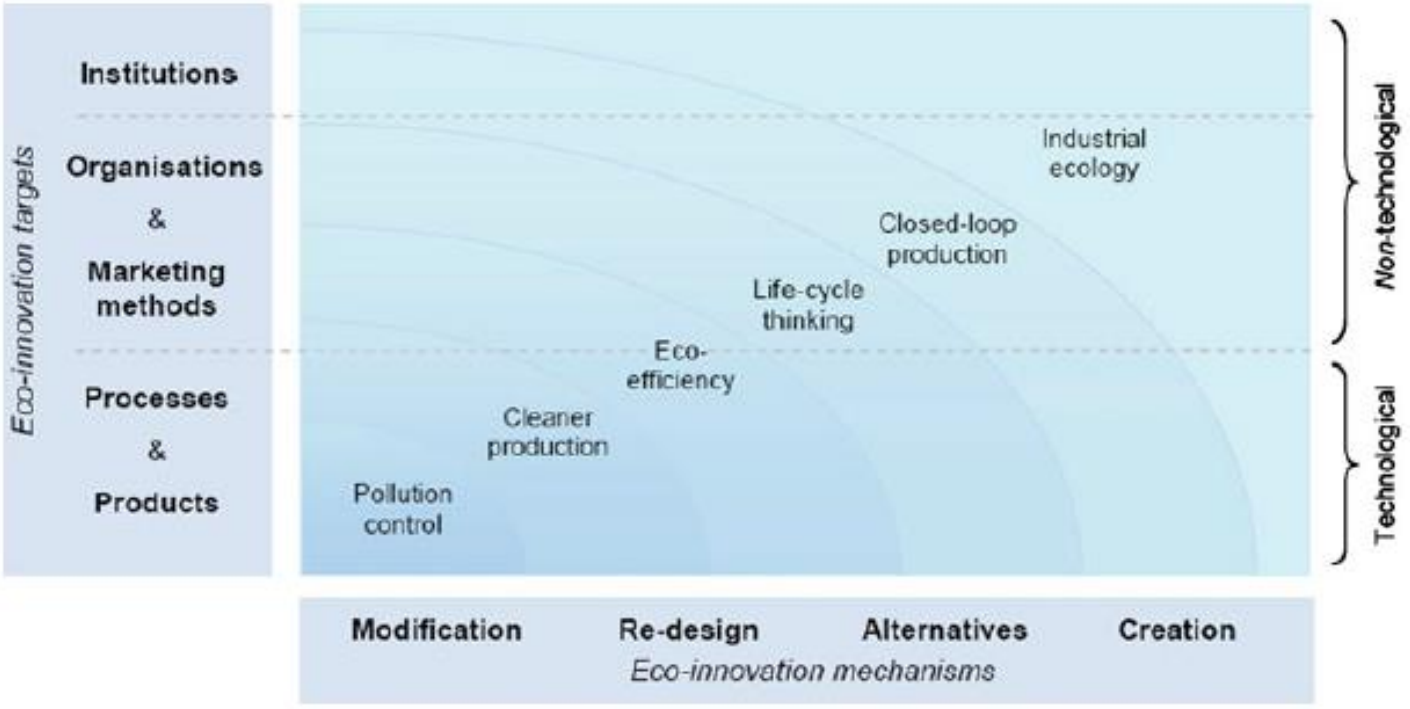
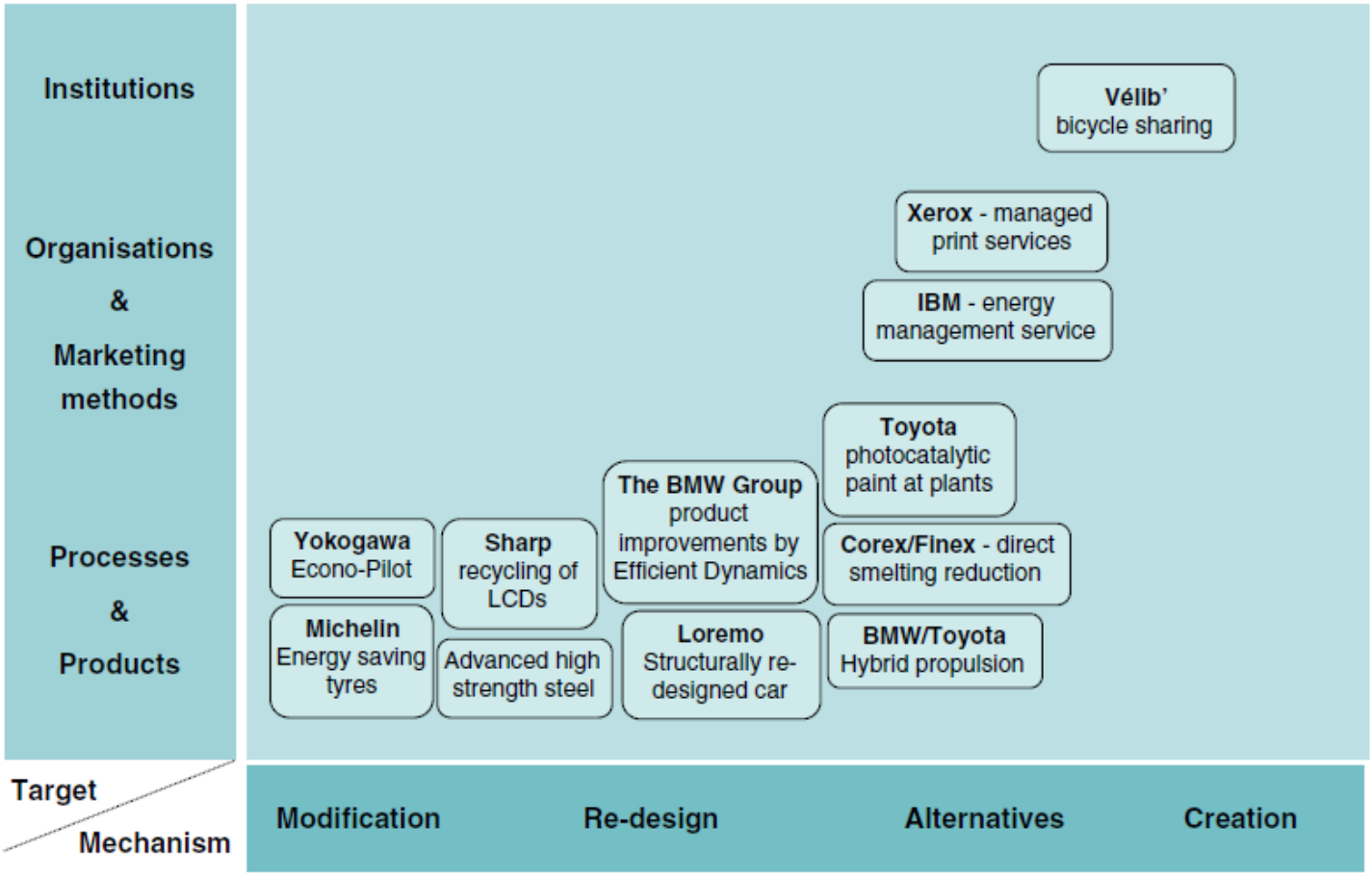



Fig. 3 Conceptual relationships between sustainable manufacturing and eco-innovation

*Source: Machiba, 2010*

# Firm level mapping



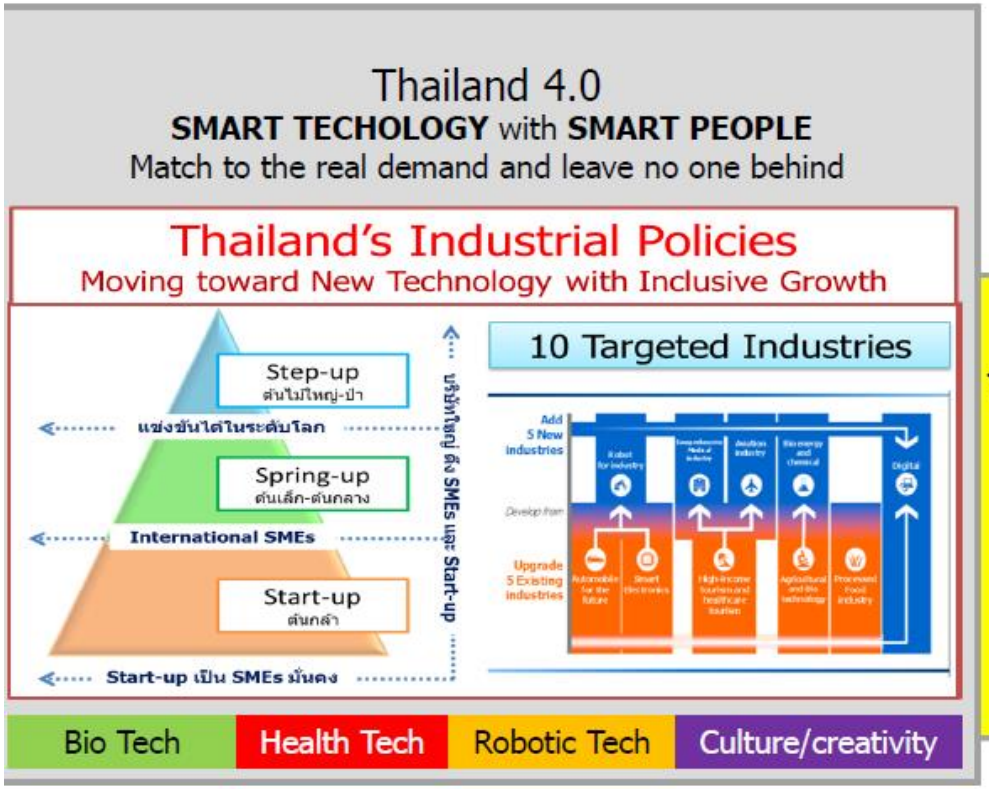

*Source: Machiba, 2010*

# Eco-innovation and environmental performance

- A study by Beltran-Esteve & Picazo-Tadeo, 2017 concludes that
  - **Eco-innovator countries– the Netherlands, Sweden, Ireland, the UK, Luxembourg >> environmentally efficient**
  - Correlation between GDP, the share of industrial activities in aggregate value added, and indicator of environmental awareness
    - **>> the wealthier the (EU) countries, the more environmentally efficient.**
- (based on data until 2013)

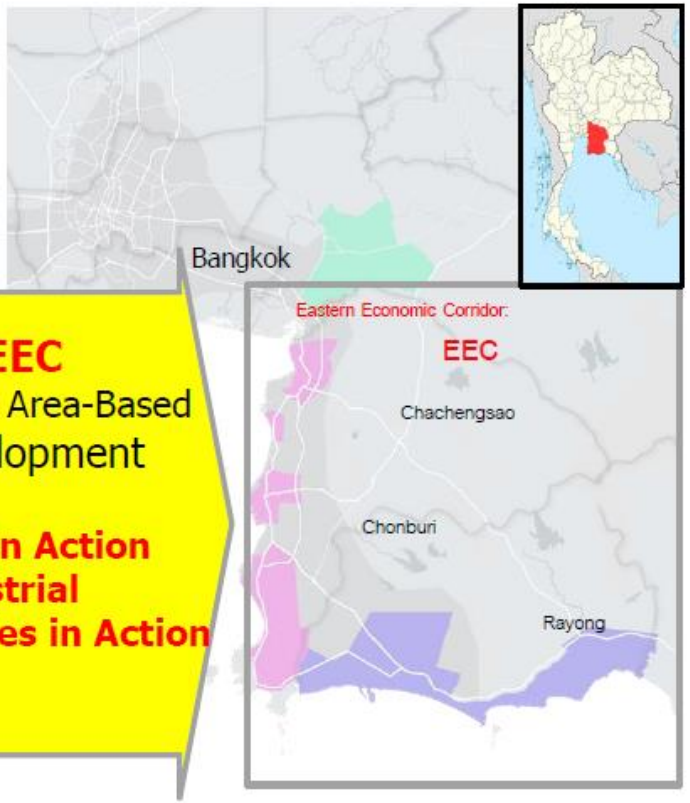
# Thailand 4.0 and Eco-innovation

# Thailand 4.0 and Eco-innovation




**EEC**
The First Area-Based Development

- **T4.0 in Action**
- **Industrial Policies in Action**




3

# Innovation and Public Policy: Government's role in innovation

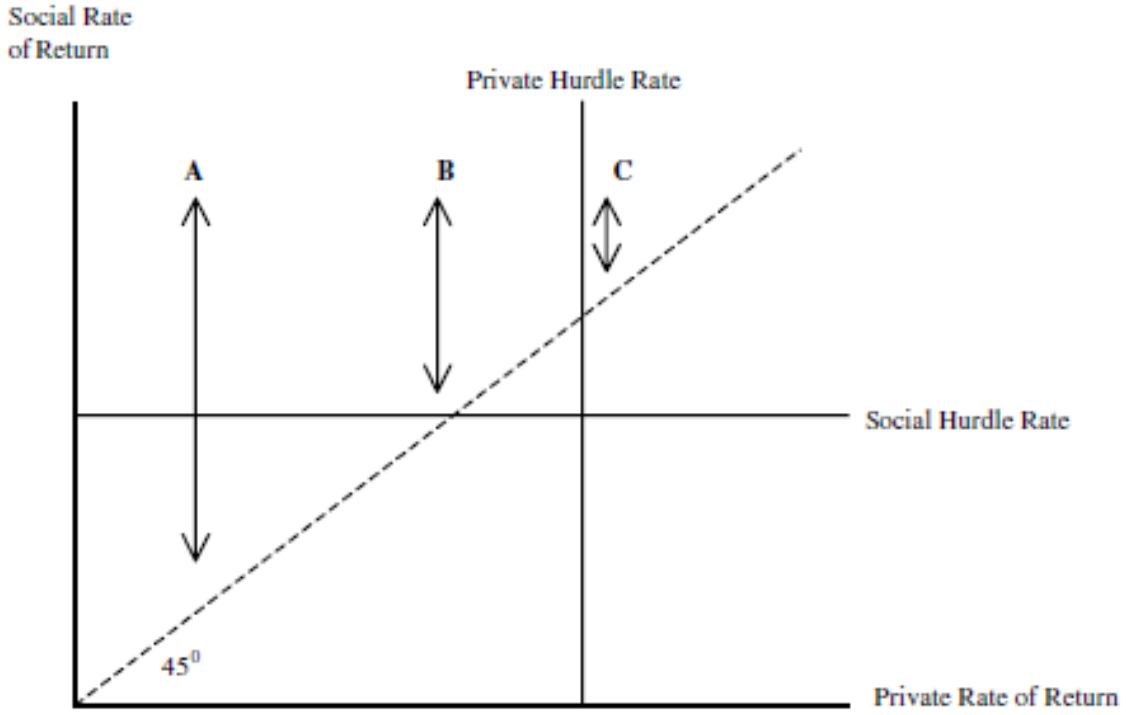



Figure 6. Gap between social and private rates of return to R&D projects.

*(Source: Audretsch et al, 2002)*

# Innovation and Public Policy: Government's role in innovation

1. Patent laws
2. Tax incentives
3. Improved environment for collaborative research
4. Subsidies to fund the research

(source: Audretch e al, 2002)

# Innovation and Public Policy: Government's role in eco-innovation

Env. benefits

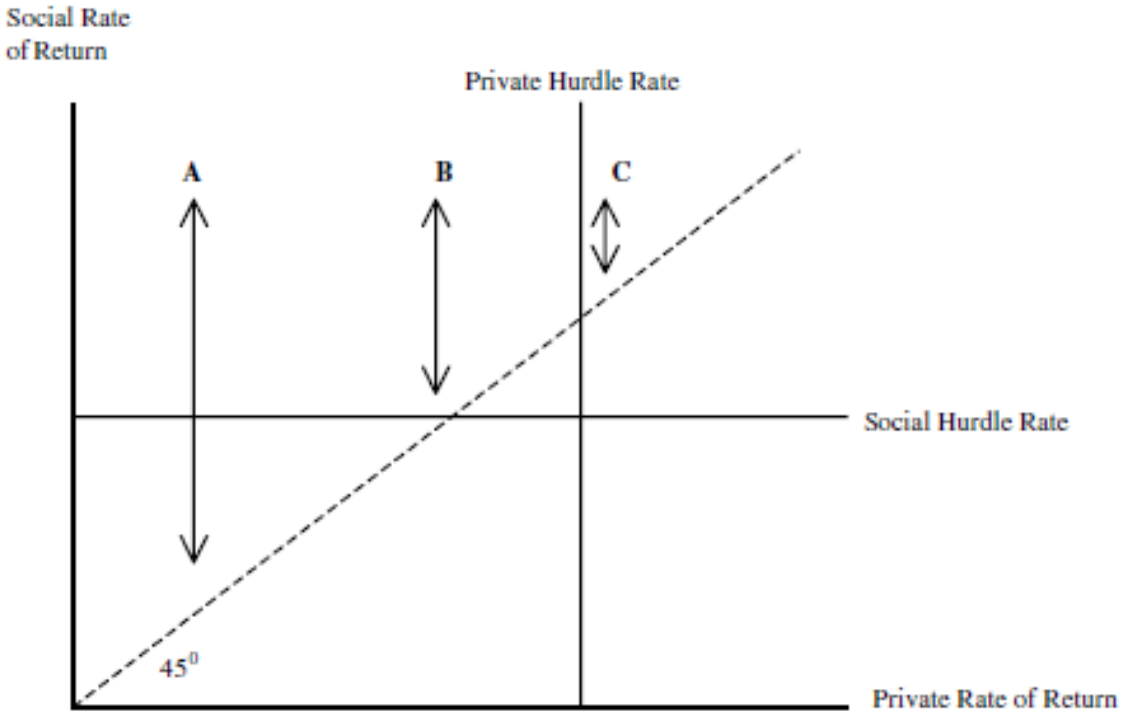



Figure 6. Gap between social and private rates of return to R&D projects.

*(Source: Audretsch et al, 2002)*

# Eco-innovation and public policy

1. Sending right price signals to enable private investments in green projects;
2. Removing barriers to sound resource management in public procurement (green procurement ie energy saving purchase);
3. Removing barriers to trade in green products and services (carbon-neutral, niche hotels);
4. Reforming public's green budgeting;
5. Linked with industrial and competitiveness;
6. Inter-ministerial, and horizontal collaboration.

(source: Beltran-Esteve & Picazo-Tadeo, 207)

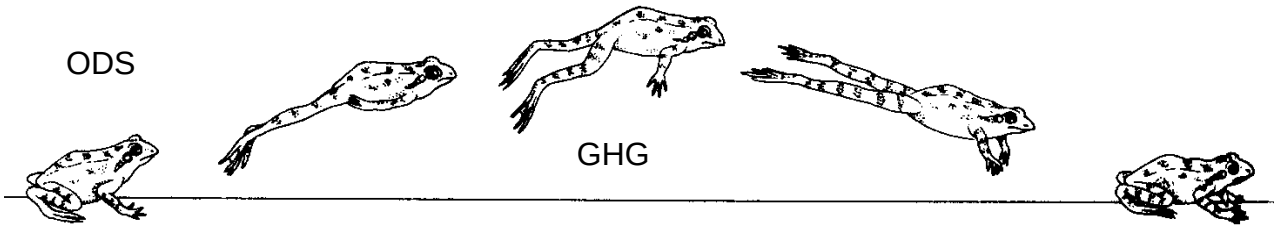
# Eco-innovation: UNIDO's Projects

1. Saving the ozone and reduction of GHG emission in fishing industry in Vietnam
2. CleanTech Accelerator for Start-ups – ongoing-Malaysia-Thailand
3. Urban-industry symbiosis- formulation

# Reduction of Ozone depleting substances and GHG emissions in fishing industry in Vietnam

# Refrigeration alternative options

- The Montreal Protocol has contributed to GHG emission reduction, ODS alternative technologies are more energy efficient and have a reduced global warming potential (GWP).
- It is estimated that since the late 1980s the Montreal Protocol has reduced GHG emissions by around 8 Gt CO2eq annually.
- (HFCs) developed and promoted as ODS alternatives, are now considered “transitional substances” because of their high GPW.



# Project in Viet Nam – Overview

Expected Outcome: Technology with low global-warning potential (**hydrocarbon system**) is demonstrated, replicated and deployed.

Aim: To introduce alternative refrigerant systems to the Vietnamese market and to demonstrate their effectiveness to policy-makers, facility owners and operators.

The mechanisms that will be put in place include:

(i) Pilot facility conversions;

(ii) Financial scheme for facility owners to convert their facilities to the new technology;

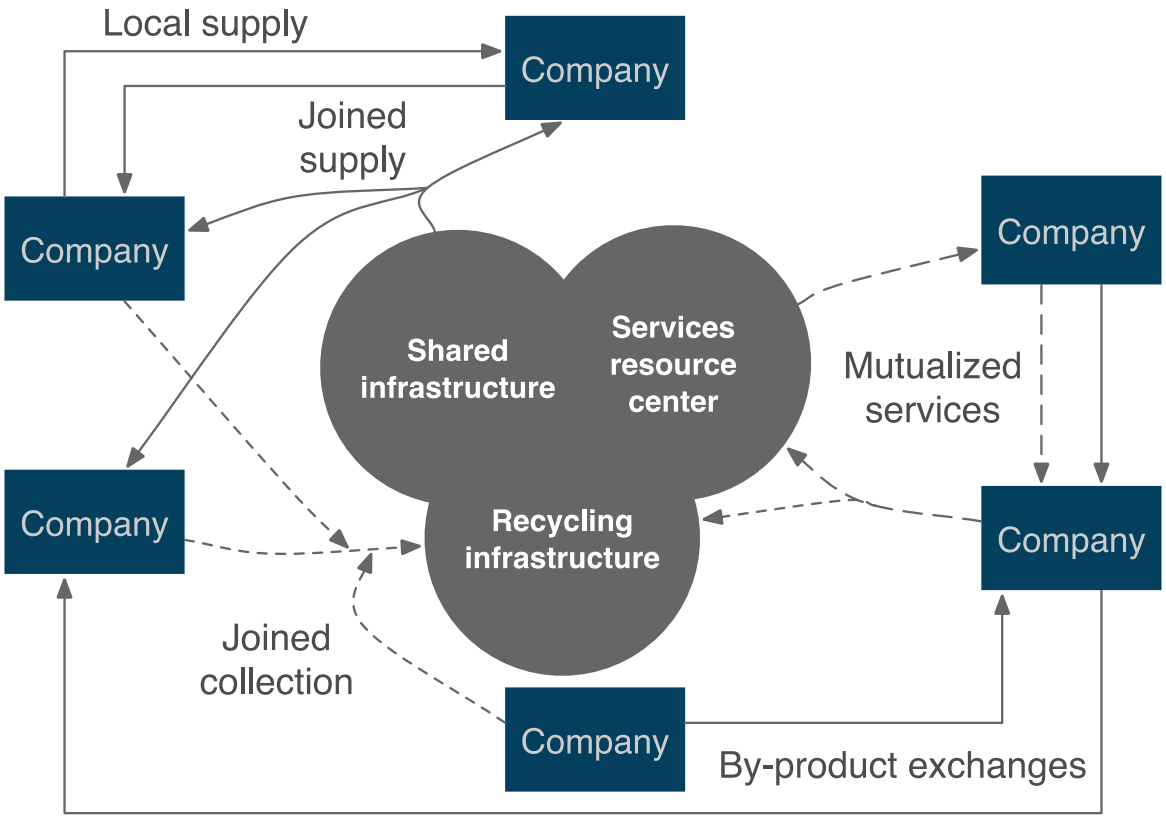
(iii) Creation of a local knowledge based on alternative refrigerants, including training and capacity building.

# CleanTech Accelerator for Start-ups – ongoing- Malaysia-Thailand


The Sustainable Development Goals and the Paris Agreement are the world's commitment to safeguarding the global commons. The United Nations Industrial Development Organization (UNIDO), with its unique mandate to support inclusive and sustainable industrial development, has partnered with the Global Environment Facility (GEF) to address the most pressing global environmental challenges of our time. Through fostering innovation and entrepreneurship ecosystems, UNIDO and GEF seek to promote affordable and scalable solutions enabling our partner countries to leapfrog to cleaner, more resilient economies.

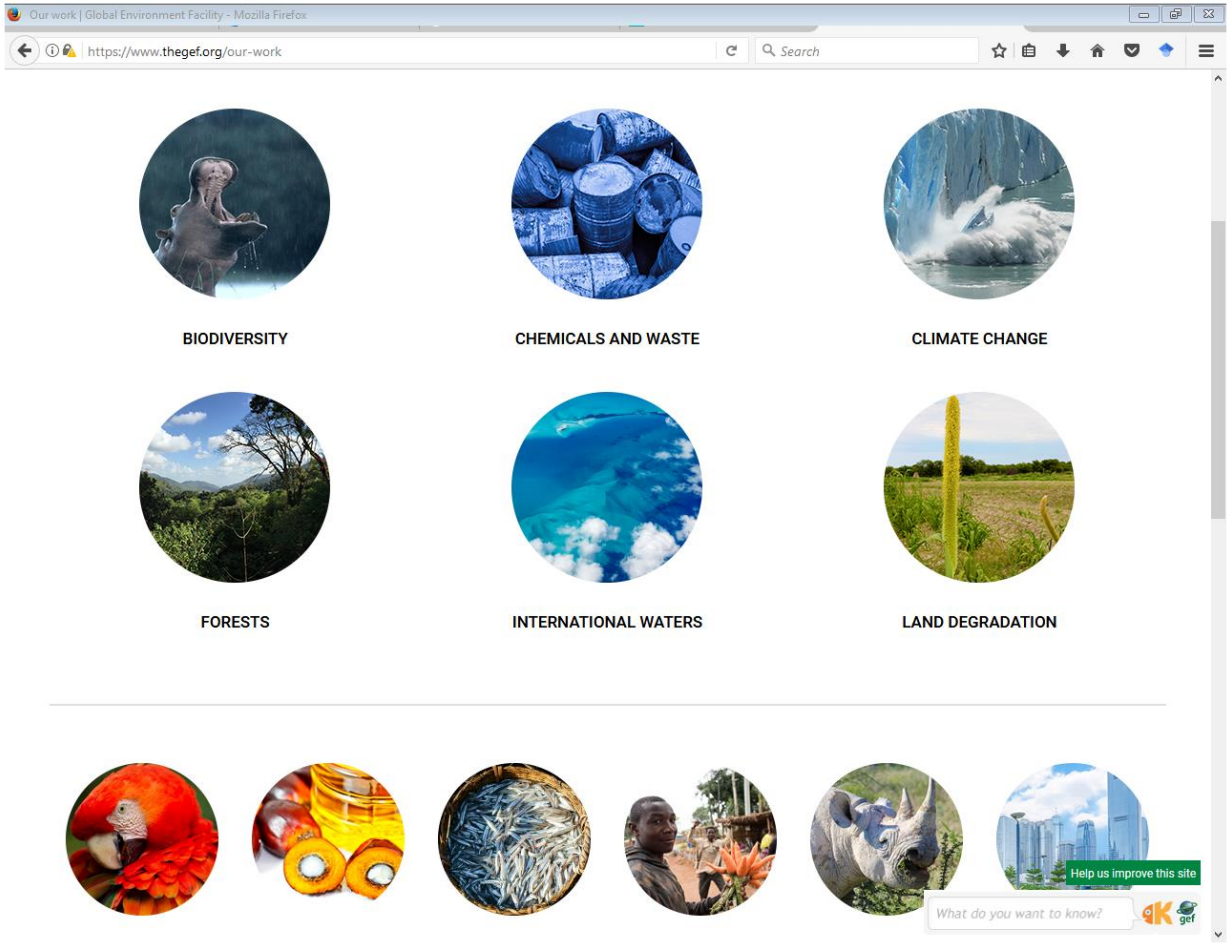

Winners of Global Cleantech Innovation awards in Thailand announced, 22 Sept, http://www.unido.org/news/press/winners-of-global-cl.html

# 3: Urban-Industry Symbiosis and Green Chemistry (Thailand, formuation)




Eco City / Eco Town
Eco School
Eco Industrial Town
Eco Family
BANK
Eco Industrial
Zone / Estate
Eco Community
Green Factory

# Financing eco-innovation: Global Environment Facility www.thegef.org



Sooksiri Chamsuk

Programme Officer

UNIDO Regional Office in Thailand

Tel: 022808691-4 ext 104 | Mobile: 66-87-0221166

E-Mail: s.chamsuk@unido.org