ASEAN SCP Framework & Sustainable Tourism: Role of Circular Economy

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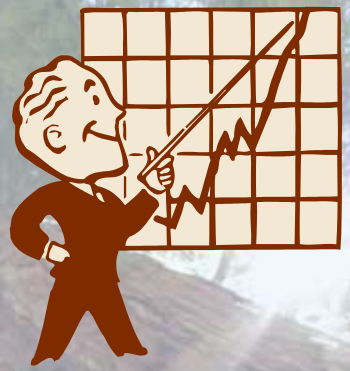
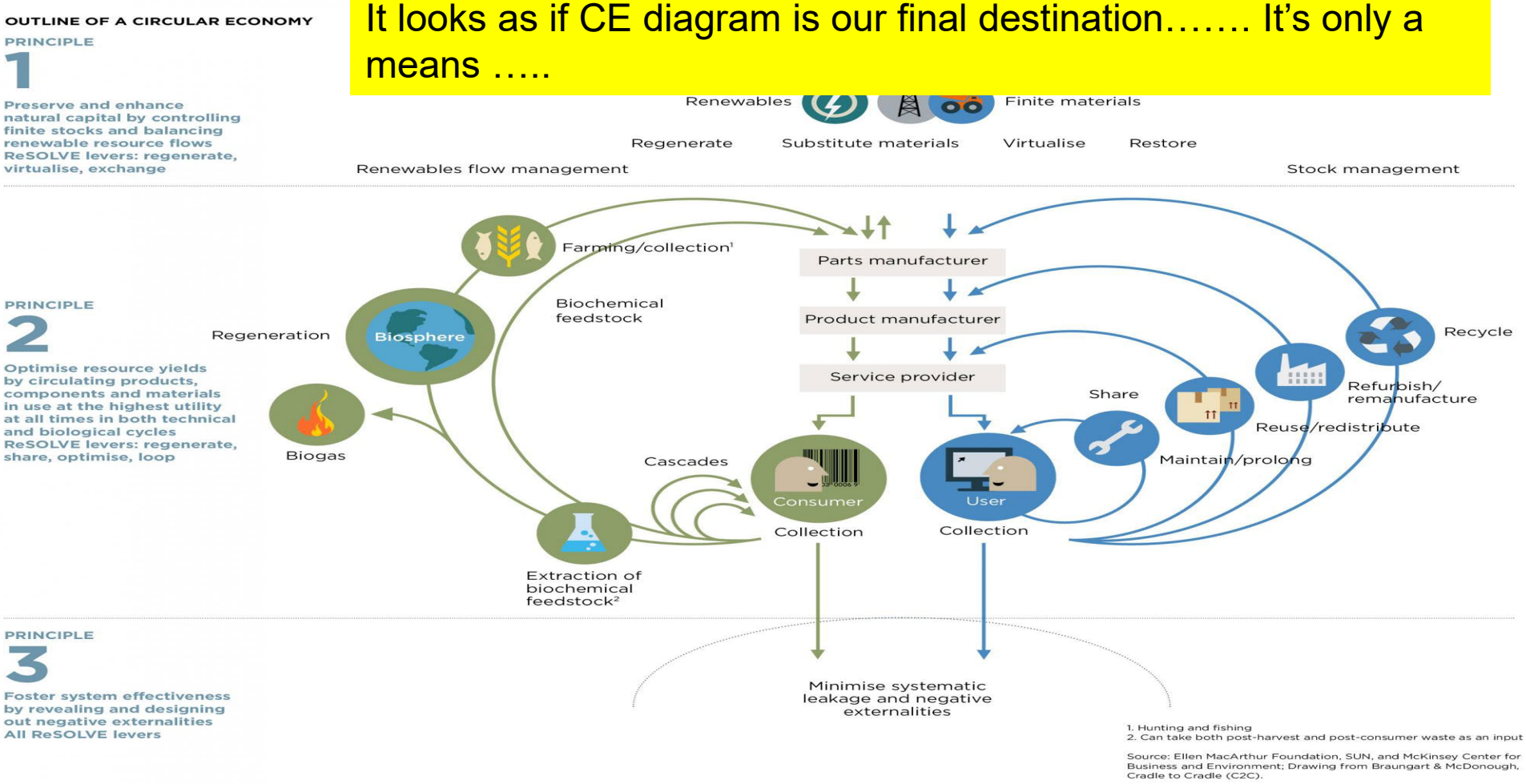
Outline of Presentation



- ASEAN SCP Framework
- Green Industry Initiative in Asia
- System Approach
- RECP applied to tourism industry
- Circular Economy implementation

It looks as if CE diagram is our final destination……. It's only a means …..



International Resource Panel

Sustainable Development is the main goal
while Decoupling is the framework behind SDGs
At this point of time ….. DPSIR approach

UN environment

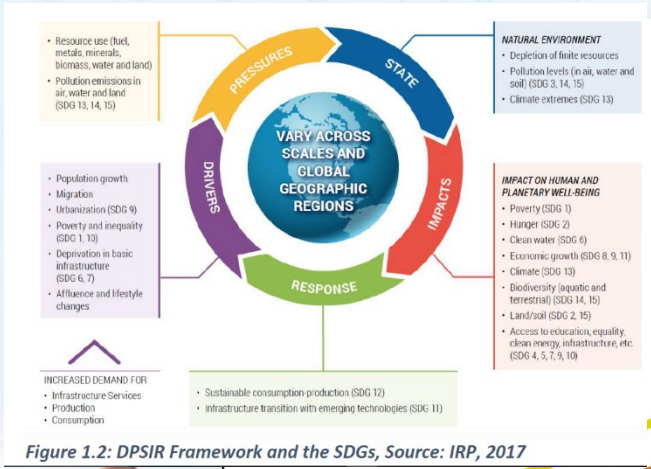
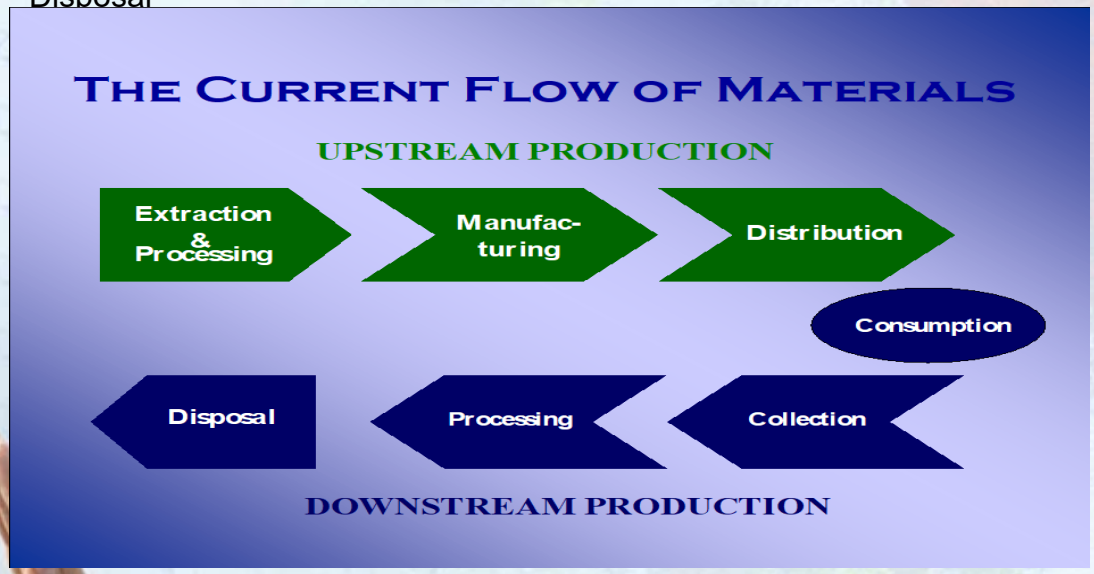


Figure 1.2: DPSIR Framework and the SDGs, Source: IRP, 2017

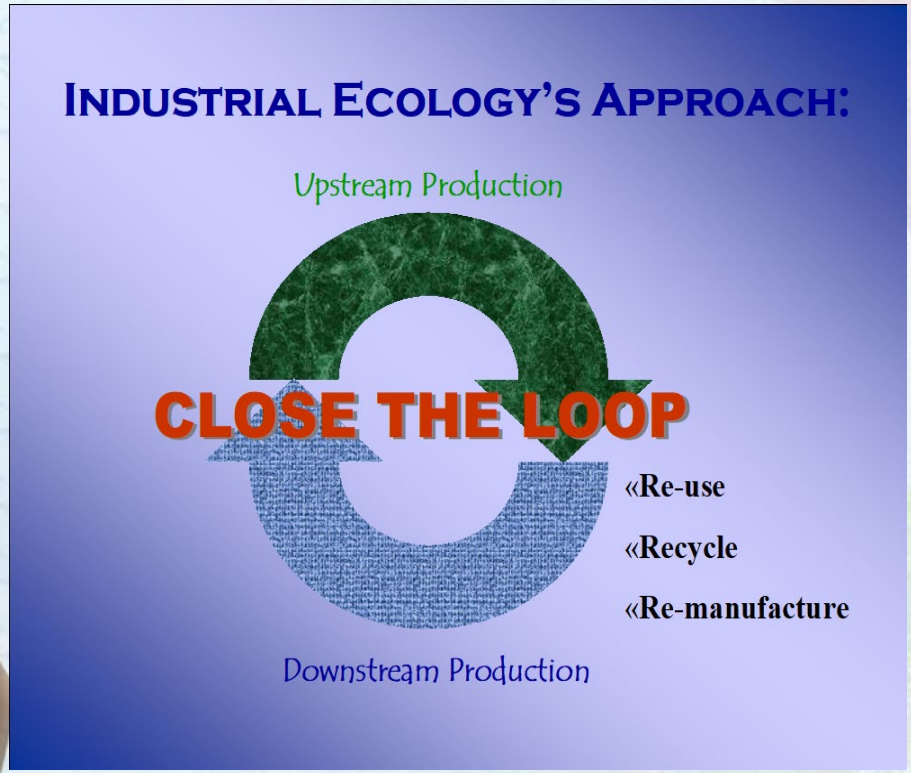
IRP 2017 Bringezu, … Chiu, … et al

… What Industrial Engineering had contributed … to the Linear Economy ….

"Mass Production & Customization to Mass Consumption & Mass Disposal"



…. Industrial Engineering can always
innovate and make continuous improvement ….
Circular Economy



Key Findings

Methodologies: **Survey and data analysis (both primary and secondary data/information)**

Key SCP priorities

- consumption of natural resources
- sustainable small and medium enterprises (SMEs), and
- waste management and recycling,

Top SCP tools

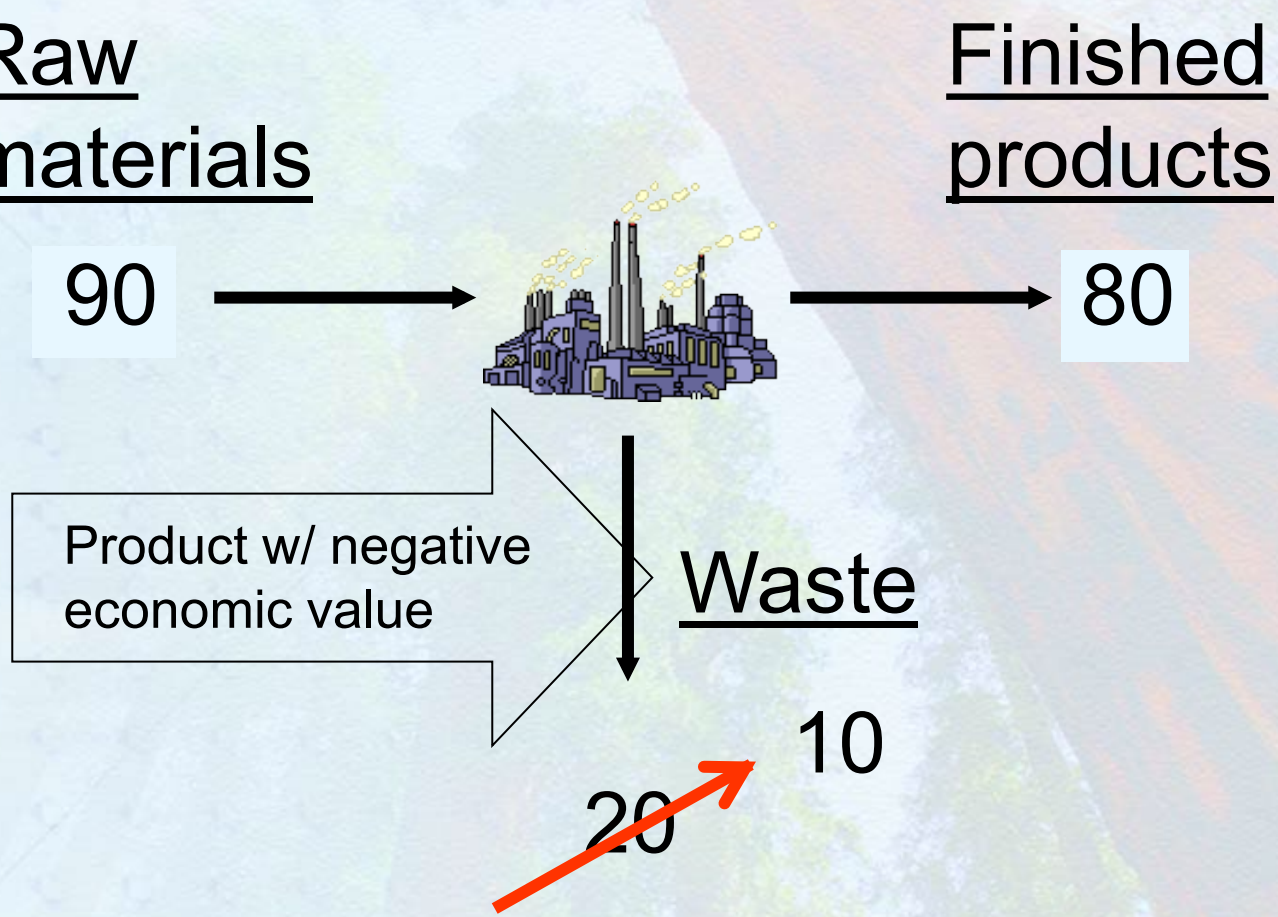
- sustainable lifestyles,
- green growth (and similar themes), and
- sustainable public procurement

****** A need to prioritize sustainable agriculture and food systems in the region and strengthen institutional capacities to support SCP implementation ********

Green Industry in Asia

- International Conference on Green Industries in Asia
  - Opportunities generated and challenges posed by a move towards resource efficient industries and sustainable production and consumption patterns
- Manila Declaration on Green Industries in Asia
  - Reaffirms the Rio Declaration on Environment and Development
  - Framework of action
- Green Industry and Greening the Industries

Material Balance Model

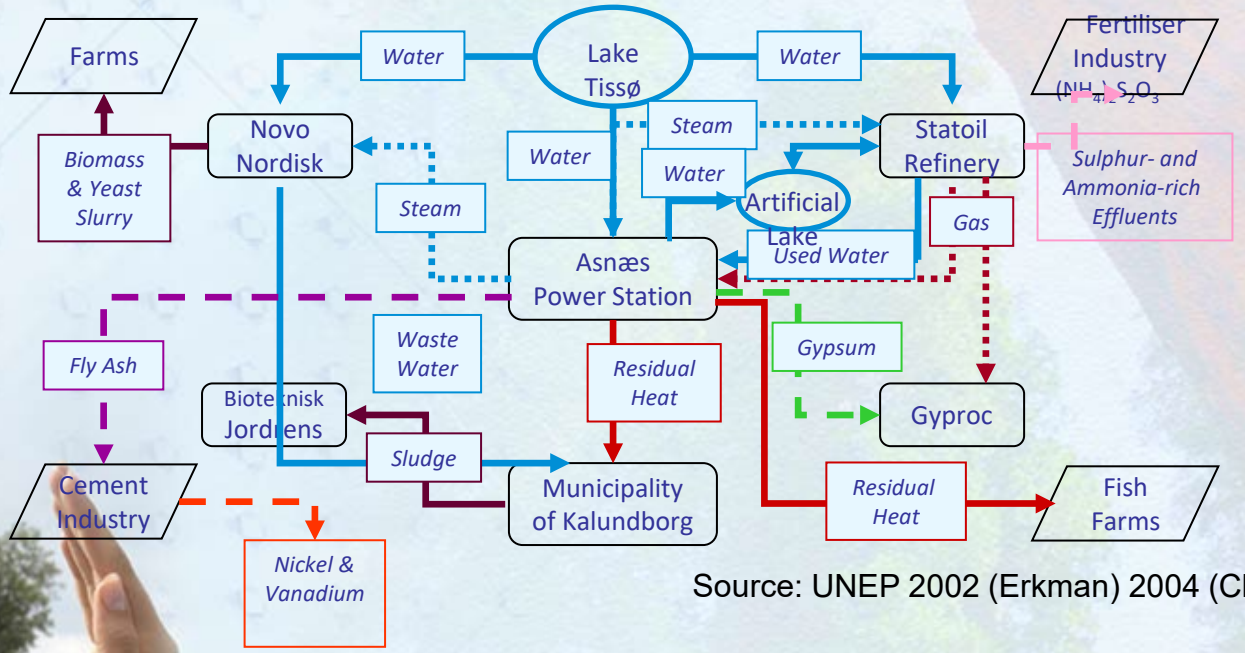


Eco City as defined …Hoi An City

- Ecocity can be defined as urban area which manages to maintain, during development process, an ecological balance, without depleting natural resources, with no environmental degradation, no harmful influence on the community health, and suitable for human living and working. In short, ecocity is a human settlement with the best living quality for its residents where natural environment is well respected.

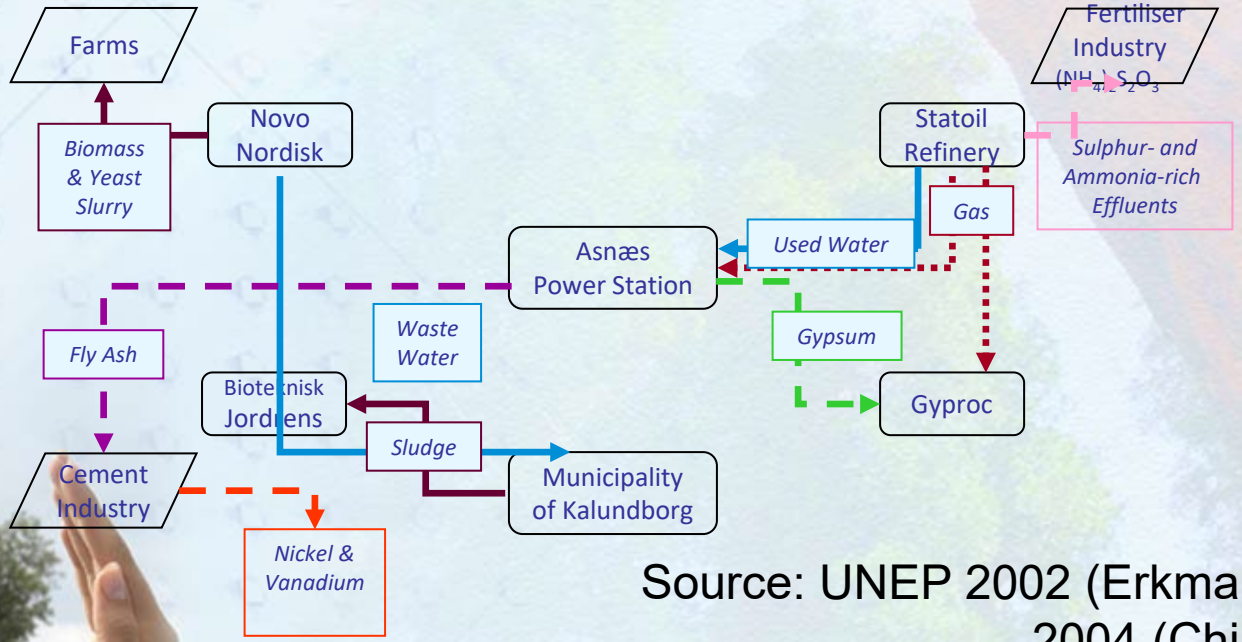
HOI AN CITY PEOPLE'S COMMITTEE
STRATEGIC VISION OF ECO CITY

Kalundborg Industrial Symbiosis



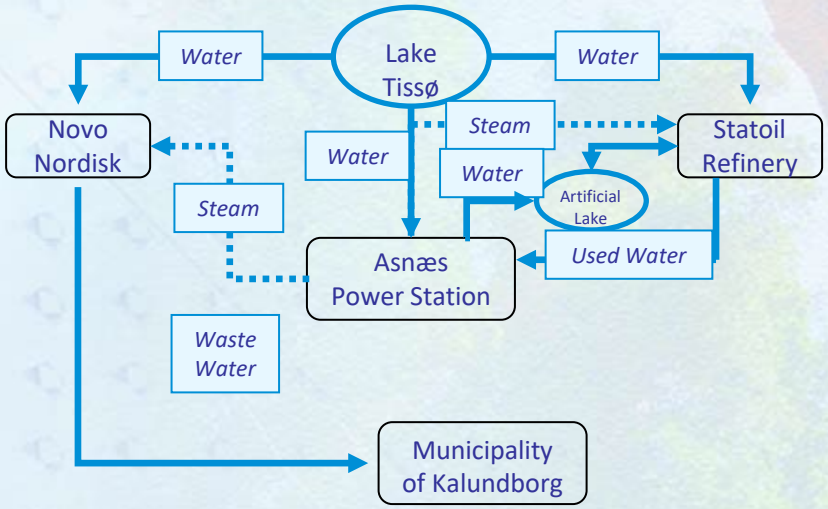
Source: UNEP 2002 (Erkman) 2004 (Chiu)

Kalundborg Industrial Symbiosis - Waste Flow



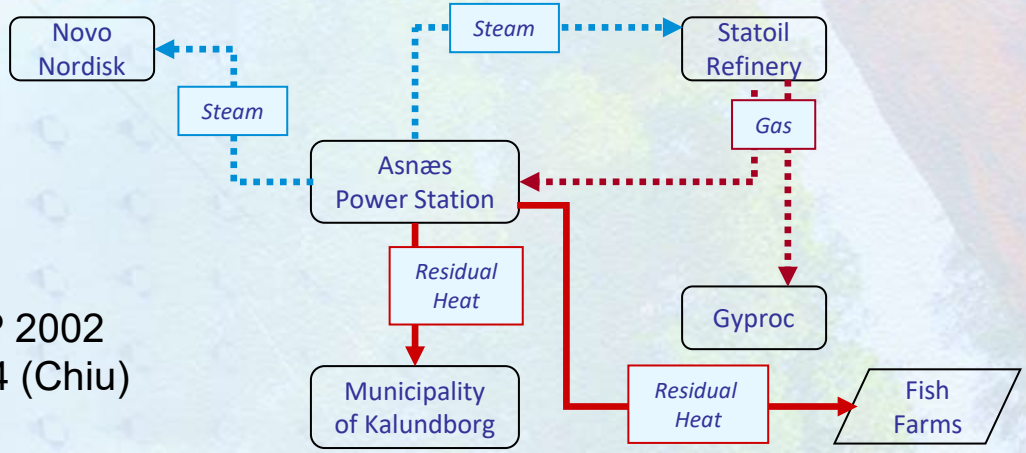
Source: UNEP 2002 (Erkman)
2004 (Chiu)

Kalundborg Industrial Symbiosis - Water Flow



Source: UNEP 2002 (Erkman) 2004 (Chiu)

Kalundborg Industrial Symbiosis - Energy Flow



Source: UNEP 2002
(Erkman) 2004 (Chiu)

Green Industry Opportunities

3R services and management to wastewater, solid waste, etc. such as MRF, Sewerage system

1M TOURISTS

HOTELS

TOUR OPERATOR

CRAFT

RESTAURANTS

RESIDENT & COM'L

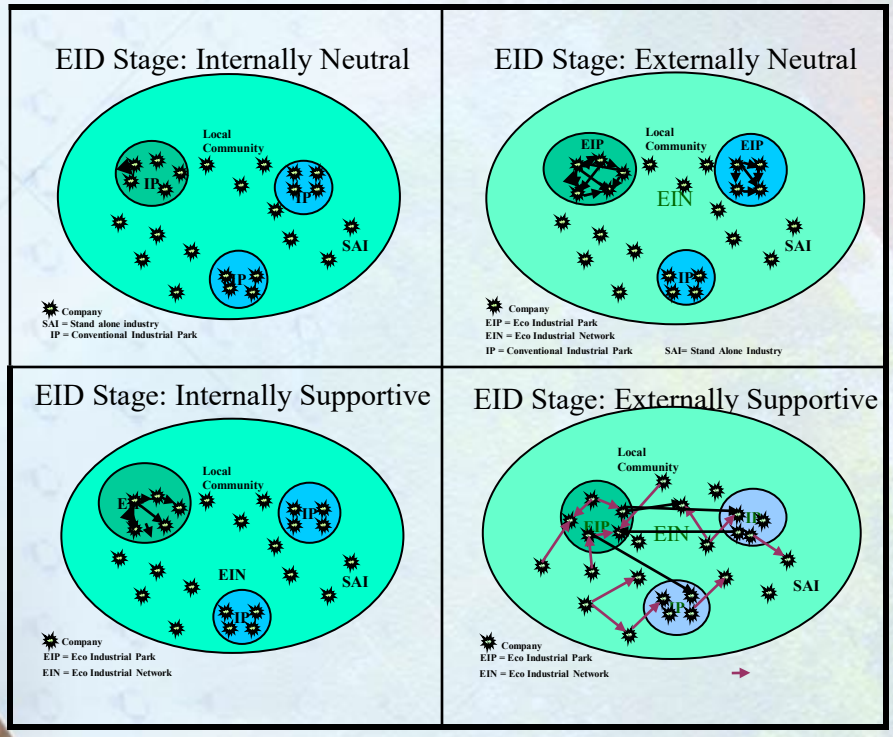
BUSES

BOATS

VEGE VILLAGE

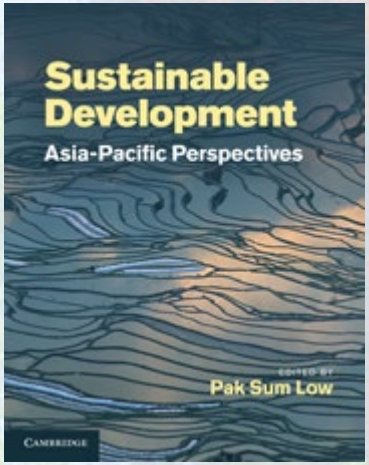
CERAMIC VILLAGE

Utilities: clean water, clean energy, etc.



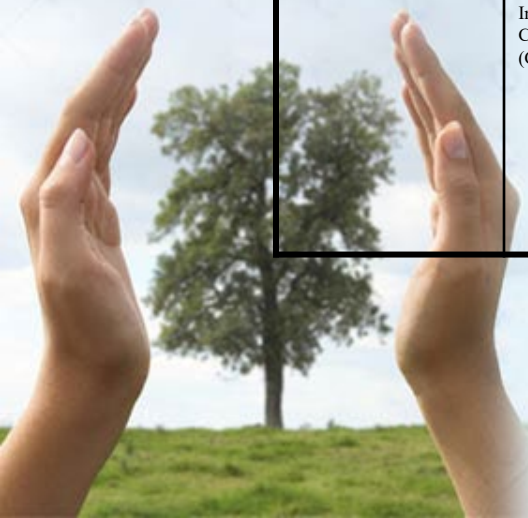
Continuum Stages Model of EIP Development in Southeast Asia

Source: Chiu, 2002-2022



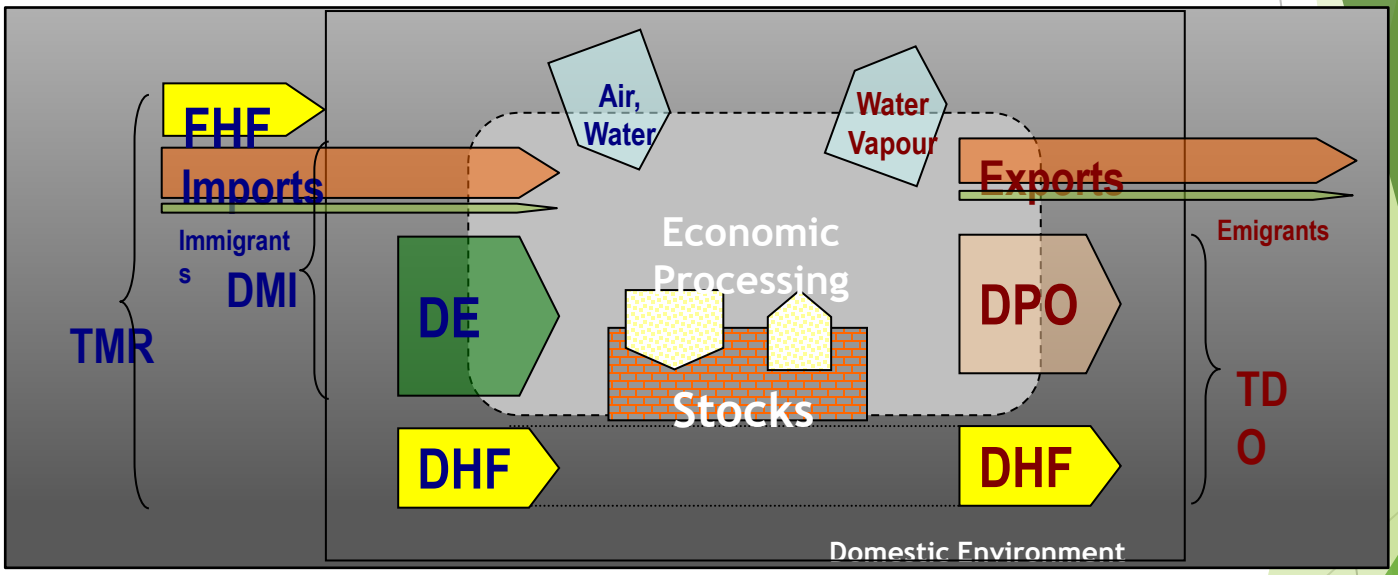
Description of the Continuum Model

Stages	Internal Neutral Industry-level Optimization	Internal Supportive Tenant Business Partner Network	External Neutral Estate-level Optimization	External Supportive Estate as asset to neighboring entities
Description	Minimizes individual industry environmental impact	Takes on supportive role on business partners' environmental performance within the industrial estate system	Minimizes environmental impact at estate level	Provides environmental services as competitive edge to regional network (e.g. neighboring estates, stand alone industries, communities)
Environmental impact of individual tenant (unit)	(0)	(+)	(++)	(+++)
Environmental impact of industrial estate (system	(-)	(-)	(0)	(+)
Economic performance of system	(+)	(++)	(+++)	(++++)
Social image of system	(-)	(-)	(0)	(+)
Programs	Cleaner Production (CP) Environmental Management System (EMS) Ecodesign Life Cycle Assessment (LCA) Environmental Management Accounting (EMA) Environmental Performance Indicator (EPI) Corporate Social Responsibility (CSR)	Greening the Supply Chain Corporate Synergy System (CSSII) Green Procurement Eco-labeling Programmatic Cleaner Production (P-CP) Programmatic Environmental Impact Assessment (P-EIA) By Product Exchange (BPX) Packaging material take back Design for Environment (DfE) Reverse Manufacturing / End of life Disassembly	Extended Product Responsibilities (EPR) Product Stewardship Material and Water Recycling Energy Cascading Co-generation Collective Utility Sharing of transportation, warehousing logistics, training, recruitment, marketing, procurement Green architecture Landscape Ecology Centralized WWTF (see Kalundborg Box) Cross Industry By product Exchange (BPX) Emergency Response System Park Environmental Management	Integrated Resource Recovery System Regional Resource Management Life Cycle Assessment (LCA) Substance Flow Accounting (SFA) Material Flow Accounting (MFA) National Policy on Circular Economy Intra- and Inter-estate Collaboration



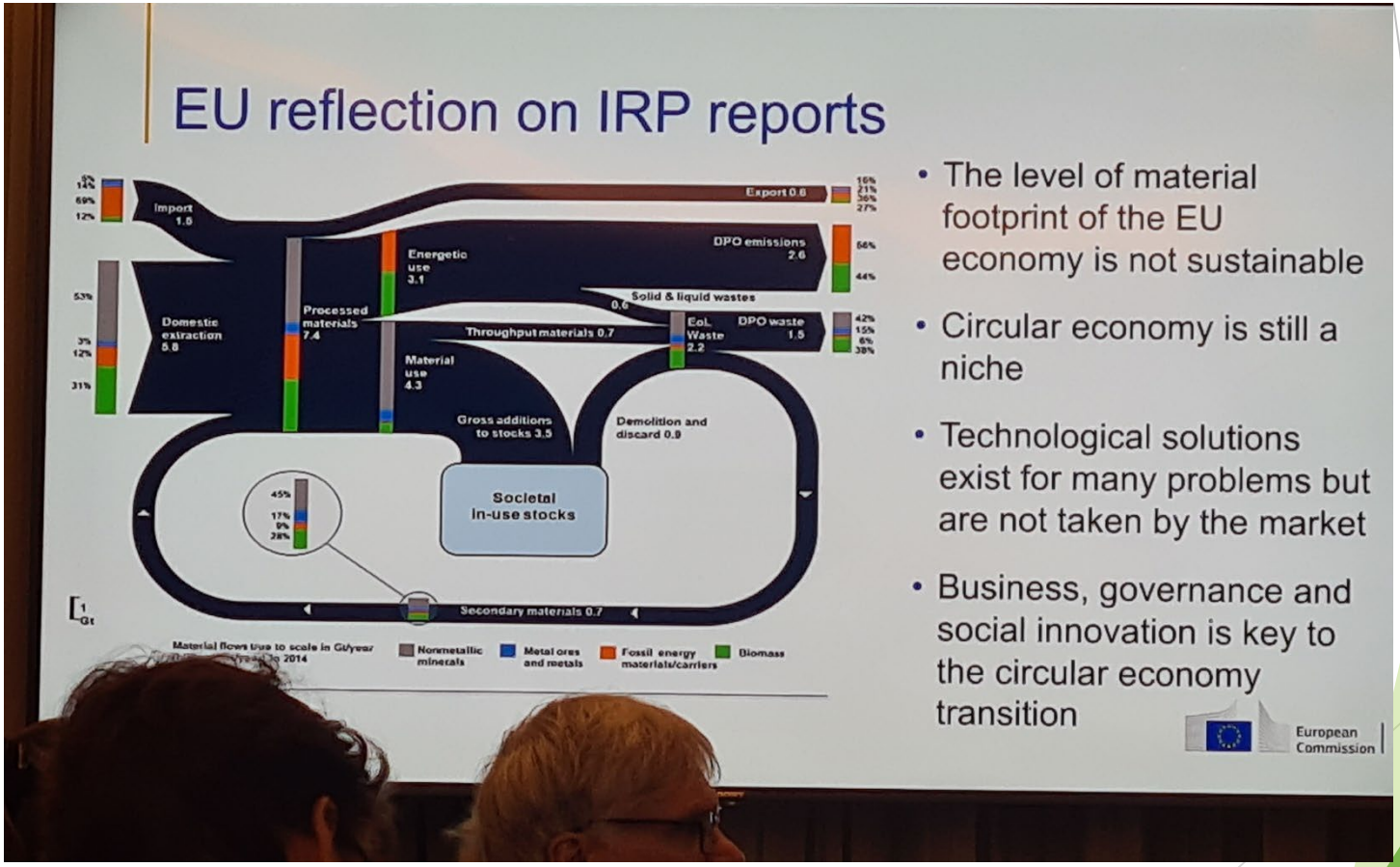
Note: (0) means neutral, no positive or negative contribution to the parameter
(+) means positive (good) impact on the environment or good social image
(-) means negative (bad) impact on the environment

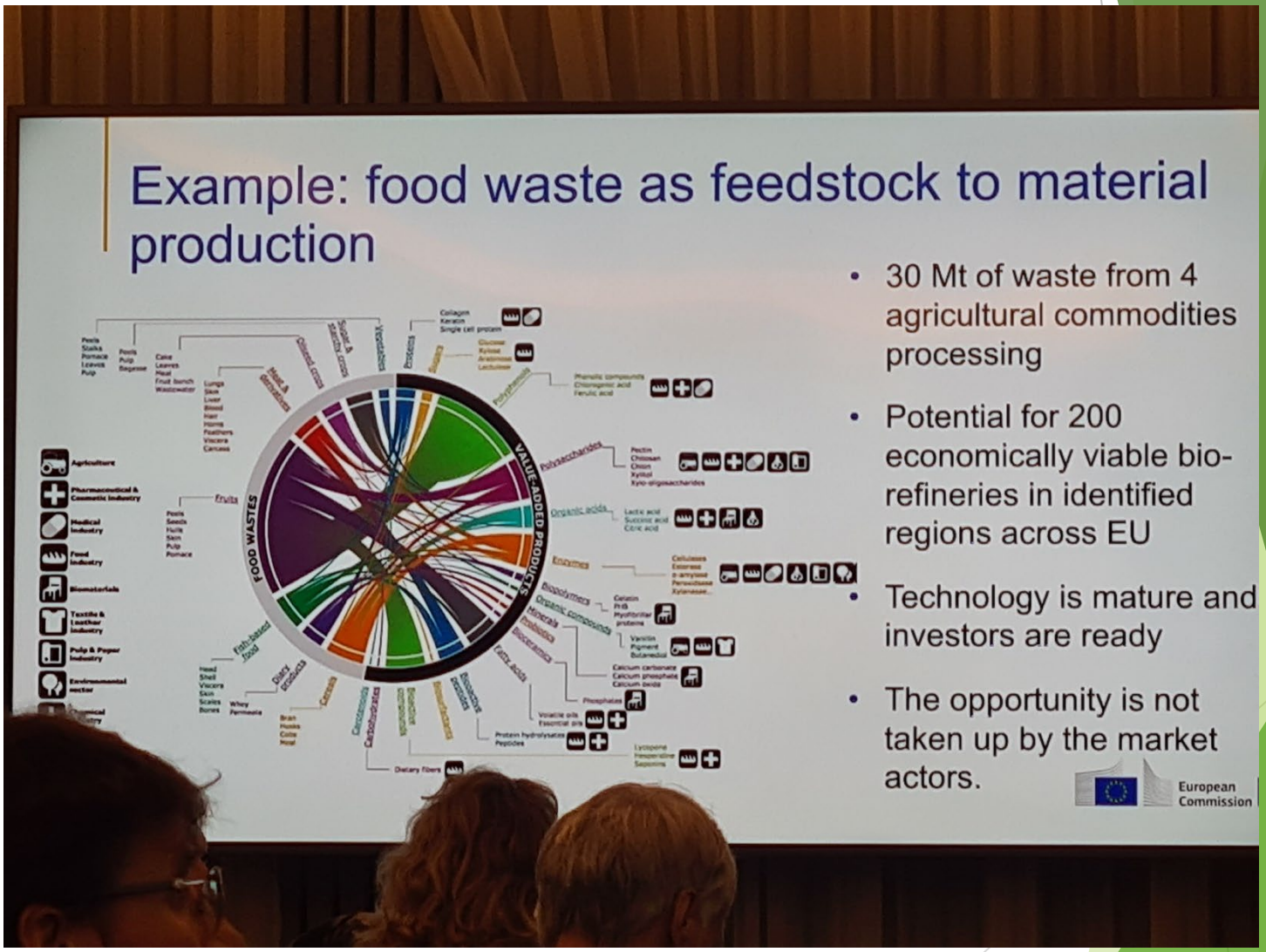
The Basic MFA Model



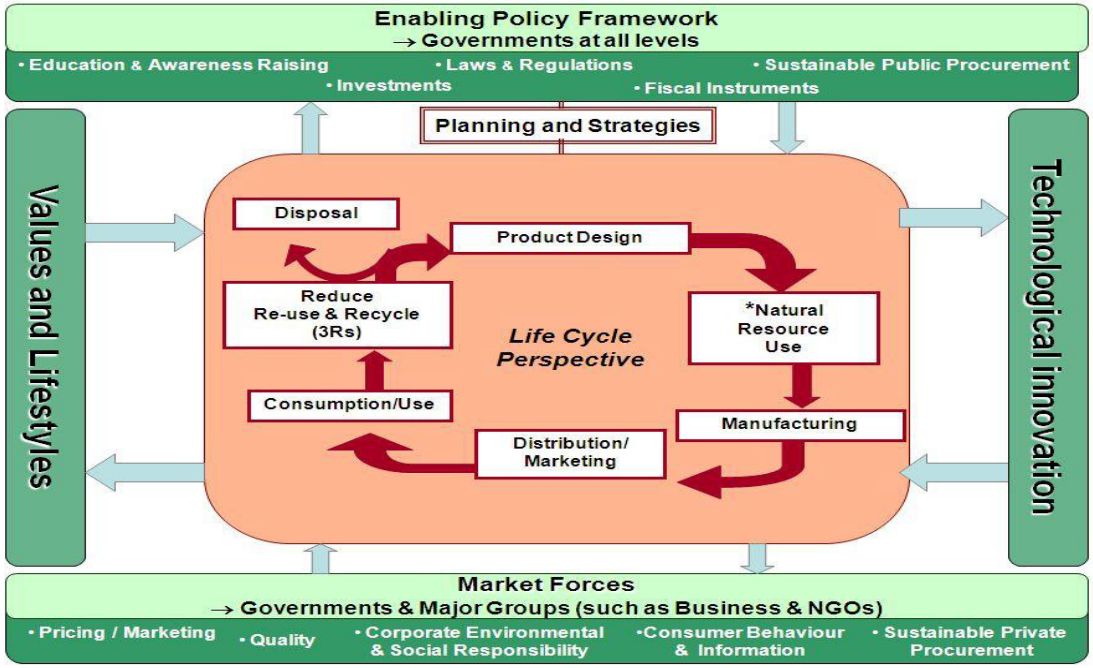
Source: WRI et al.,2000, 2016; Rapera, Chiu, et al.

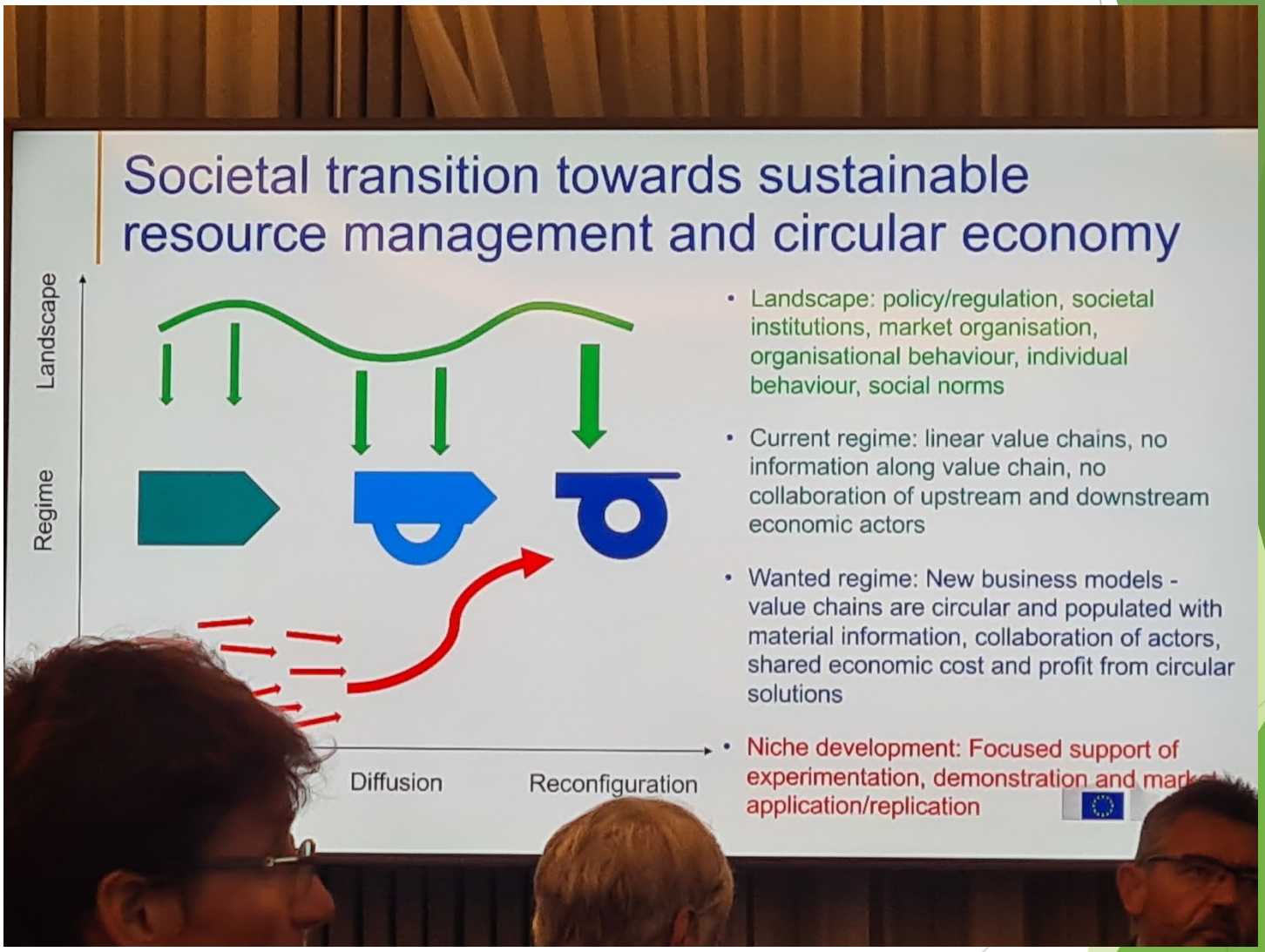
Astrid Schomaker, European Commission Director for Global Sustainable Development, Directorate General for Environment




Example: food waste as feedstock to material production
FOOD WASTES
VALUE-ADDED PRODUCTS
Agriculture
Pharmaceutical & Cosmetic industry
Medical industry
Food industry
Biomaterials
Textile & Leather industry
Pulp & Paper industry
Environmental sector
Fruits
Fish-based food
Dairy products
Cereals
Proteins
Polyphenols
Polysaccharides
Organic acids
Enzymes
Biopolymers
Organic compounds
Minerals
Probiotics
Biopreservation
Fatty acids
Bioactive peptides
Antioxidants
Antimicrobials
Carotenoids
Carbohydrates
Dietary fibers
• 30 Mt of waste from 4 agricultural commodities processing
• Potential for 200 economically viable bio-refineries in identified regions across EU
• Technology is mature and investors are ready
• The opportunity is not taken up by the market actors.
European Commission

Marrakech Process




Societal transition towards sustainable resource management and circular economy
Landscape
Regime
Diffusion
Reconfiguration
• Landscape: policy/regulation, societal institutions, market organisation, organisational behaviour, individual behaviour, social norms
• Current regime: linear value chains, no information along value chain, no collaboration of upstream and downstream economic actors
• Wanted regime: New business models - value chains are circular and populated with material information, collaboration of actors, shared economic cost and profit from circular solutions
• Niche development: Focused support of experimentation, demonstration and mark
application/replication