



Solution Architect for Global
Bioeconomy & Cleantech Opportunities



arvi
Material Value Chains

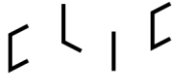
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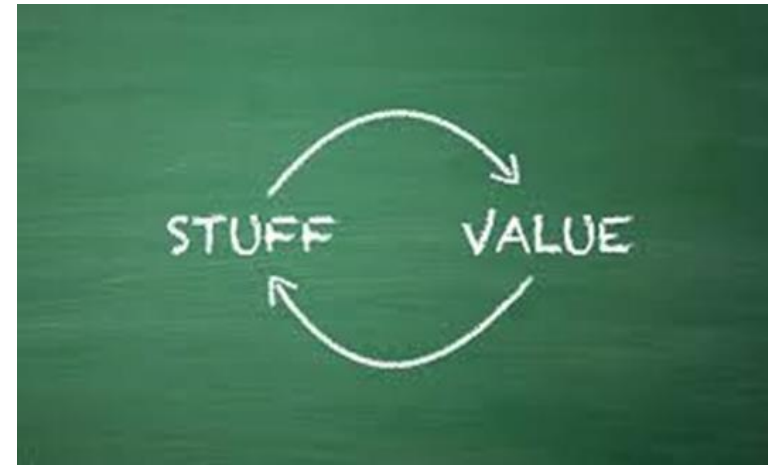
Kiertotalous liiketoimintana: systemisyyden haasteet ja mahdollisuudet

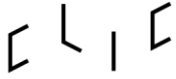
Circular economy and waste management as business: Systemic approach



— THE SHIFT IN THE SOCIETY AND MARKET: WASTE IS A VALUABLE RESOURCE

- **The shift and change** is happening globally, but...
 - The pace of shift varies in different locations
 - The shift is dictated and shaped by diverse actors, institutions and technologies
- **The shift happens in systems:** understanding of complex systems is required
 - *The aim of this theme was to investigate systems comprising various actors and mechanisms of influences; the networked business and the market realities of local business environments consisting of various parties and differing business processes.*
 - *Case studies: Finland/Europe; Brazil, China, US*
- **The shift changes business processes** of the networked business:
 - At which process phase does waste have value? What is waste?
 - Where does our business get revenue from?
 - How would potential transitions affect our business
 - How would they affect our customers', partners', or competitors' businesses.





Circular economy and waste management as business

AGENDA

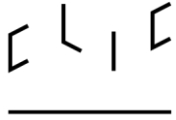
1. THE CONTEXT FOR BUSINESS:

- **SYSTEMIC CONTEXTS**
waste business ecosystems
- **CONTEXTUAL DRIVERS AND BARRIERS**
global and local barriers

2. THE MEANS FOR BUSINESS:

- **BUSINESS OPPORTUNITIES**
identified along ARVI
- **BUSINESS MODEL**
elements for value propositions, value creation and value capture



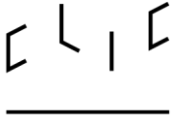


THE SYSTEMIC CONTEXT FOR BUSINESS:

- Systemic environment
- Business ecosystems and value networks

Due to the interconnectedness of *technologies and market and societal actors*, waste management and CE businesses are shaped by many interrelated organizations, individuals, and institutions that reciprocally influence each other.





GLOBAL SYSTEMS – LOCAL VARIATIONS

Business ecosystems for waste management or CE: two local variations

- Finland
- Brazil

Ecosystem: includes policymakers, users, private companies, the government, customers, suppliers, regulators, the municipality and also the informal sector.

Value creation and capture:

- Value capture differs significantly in different locations.
- Many global environments lack the ecosystem-level value capture processes and structures and thereby business models are often more company-centric than collaborative by nature.

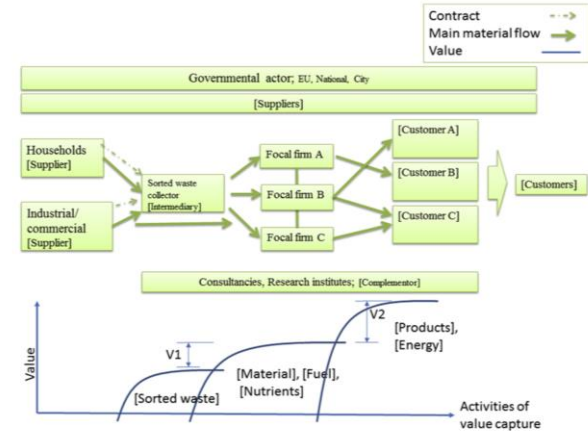


Fig. 1. Value capture in the waste business ecosystem in Finland: actors, structure, and process.

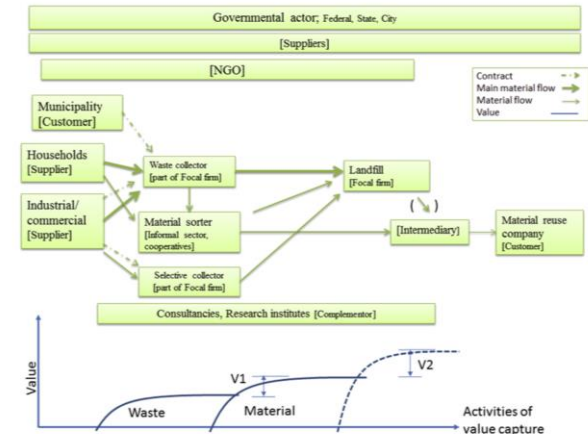
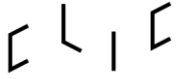
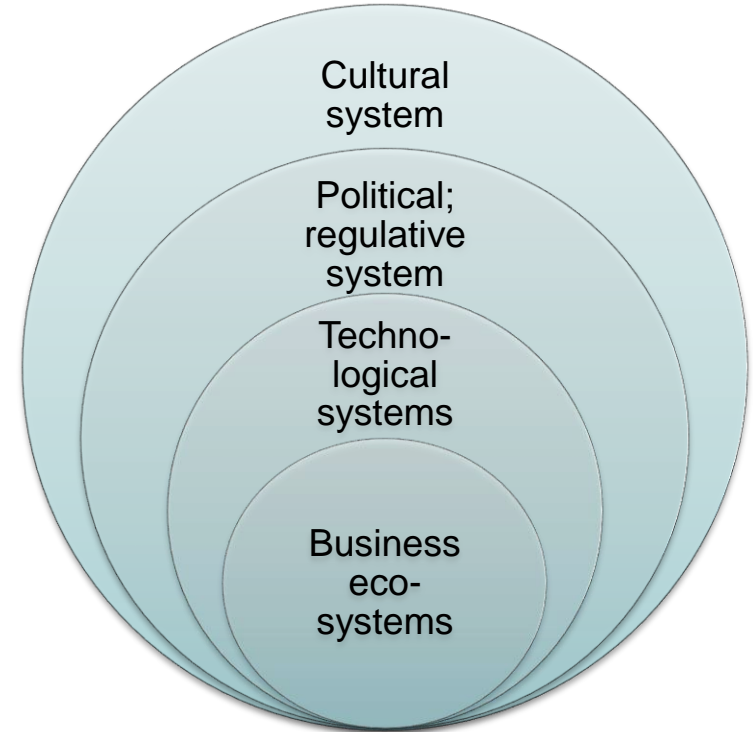


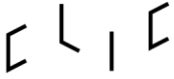
Fig. 2. Value capture in the waste business ecosystem in Sao Paulo, Brazil: actors, structure, and process.



DRIVERS AND BARRIERS ORIGINATING FROM THE SYSTEMIC CONTEXT

- Drivers and Barriers suggested by Institutional Theory: Beliefs, Conventions, Norms, Regulations, etc.
- Cultural drivers and barriers: Understanding of the need to reduce pollution and balance consumption of natural resources to their availability.
- Regulative/political drivers and barriers: Regulative drivers widening the scope from recycling to other product lifecycle phases can help to achieve more benefits from CE.
- Barriers and drivers vary significantly across global business environments:
 - Europe: Waste management infrastructure with a focus on source separation supports recycling
 - China: Informal sector has influence locally. Manufacturing facilities create global demand for recyclables
 - US: Minimal source separation and low commodity prices changing the landscape for recycling business.

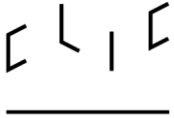




IDENTIFIED BUSINESS OPPORTUNITIES

- *Information-based and smart technology-based opportunities*
 - Real-time analysis of incoming material (e.g. Copper smelters; Ash data sharing online, “marketplace for ash”)
 - Intelligent waste collection systems
- *Adding value through design and process management*
 - Ecodesign
 - Branding based on recycling
 - Extensive ‘deposit-system’
- *Adding value through improved technologies*
 - More efficient waste sorting technologies for plastics; clean plastics; challenges in cable recycling
- *Global opportunities*
 - Solutions for increasing waste sorting in the beginning of the cycle
 - Waste-to-Energy solutions
 - Small scale bioenergy facility for shantytowns
 - Collaborative joint solutions with collaborative BM: Collection + logistics + modern technology landfill services





BUSINESS MODEL IMPACT

Value proposition: What is in it for the customer?

- B2B context: recycled materials, better alternatives for waste management.
- For consumers – contribution to sustainability?

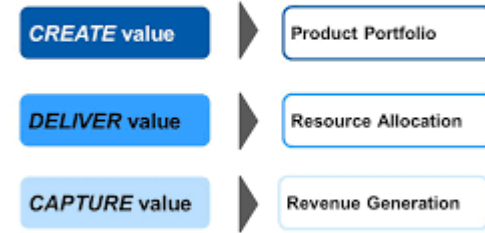
Value creation and delivery

- Securing the acquisition of suitable waste with new partners.
- New processes and technologies require new competencies.
- Value networks can change when the customer is simultaneously a supplier.

Value Capture: Diversifying methods

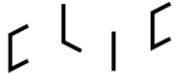
- Integrators: combining end-product sales with service fees for "waste" intake.
- Manufacturers: Realizing material efficiencies through cost reduction.

What is a BUSINESS MODEL?



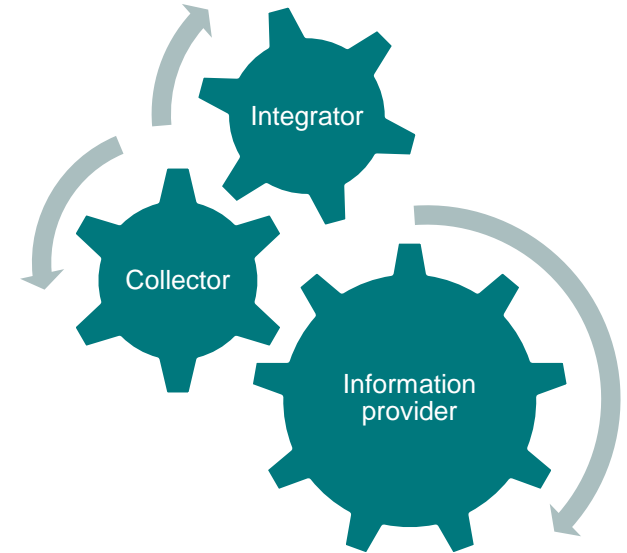
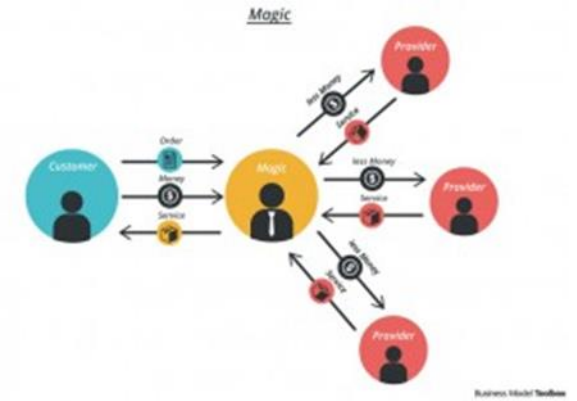
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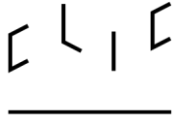




LESSONS LEARNT, SUMMARY AND TOWARDS THE FUTURE

- The global shift generates new global business opportunities but also a need to understand the complex systems driving waste business and CE in local and global environments
 - Implications to firms
 - Implications to policy makers and government
- E.g. potentials in reduce/reuse?
- E.g. collaborative business models?
- Competences to understand the system and dynamics are increasingly needed:
 - Firms need to constantly update their understanding of how to adapt to existing waste management and CE ecosystems, change existing ecosystems, or create new ecosystems in order to make successful business in the field of waste management and CE.





KIITOS!

KYSYMYKSIÄ ja KOMMENTTEJA?



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