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Is the waste sector rigged to meet today's megatrends?

Conditions for transformative innovation in waste management

1st Meeting of the EU Platform on Municipal Solid Waste Regulation & Governance 16.11.21

Agenda

A. Megatrends and conceptual building blocks
B. Illustrative case from Norway
C. Reflections on readyness and the road ahead

A

Megatrends and conceptual lenses to innovation in waste

Is the waste sector rigged for today's megatrends?

Sustainability

Digital transformation

Is the waste sector rigged for today's megatrends?

- Need for creating infrastructures and sustainable systems for management and processing of waste
- Such systems are costly and heavily integrated across many sectors such as energy, ICT, transport, agriculture, infrastructure, consumption and renovation
- An interdisciplinary challenge

How to move up in the waste hierarchy?

Three generations of innovation policies

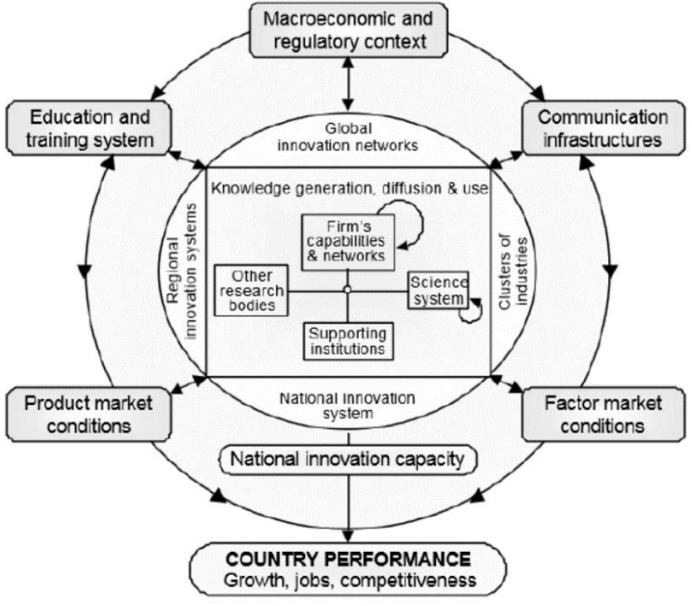
(Schot & Steinmueller 2019)

Tech push & R&D policies

- Public subsidies for knowledge development
- Policies supporting R&D & commercialization of R&D
- Policies protecting IPR's; e.g. patenting, licencing etc.

Innovation Systems Policies

- Support of knowledge and education
- Support of networks and interactions
- Support of infrastructures (roads, broadband, data sharing)
- Enabling institutions
  - Regulations, standards, legislation
  - Cultures, social norms and values



Transformative Innovation Policies (TIP)

(Weber & Rohracher 2012; Diercks et al 2019)

- **Directionality**; setting of collective priorities
- **Demand** articulation; e.g. public procurement
- **Coordination**; vertical & horizontal
- **Reflexivity**; adjust the course along the way

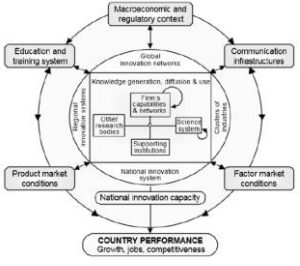
Three generations of innovation policies

(Schot & Steinmueller 2019)

1

Science push/ Linear model

2



Systems of innovation

3

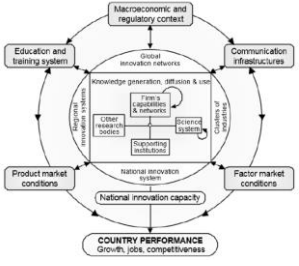
Transformative change

Support of innovation without direction / Cost efficiency

Directional innovation / Sustainability

Current examples from digitalisation in waste

RFID censors; Digitalised & optimised collection routes

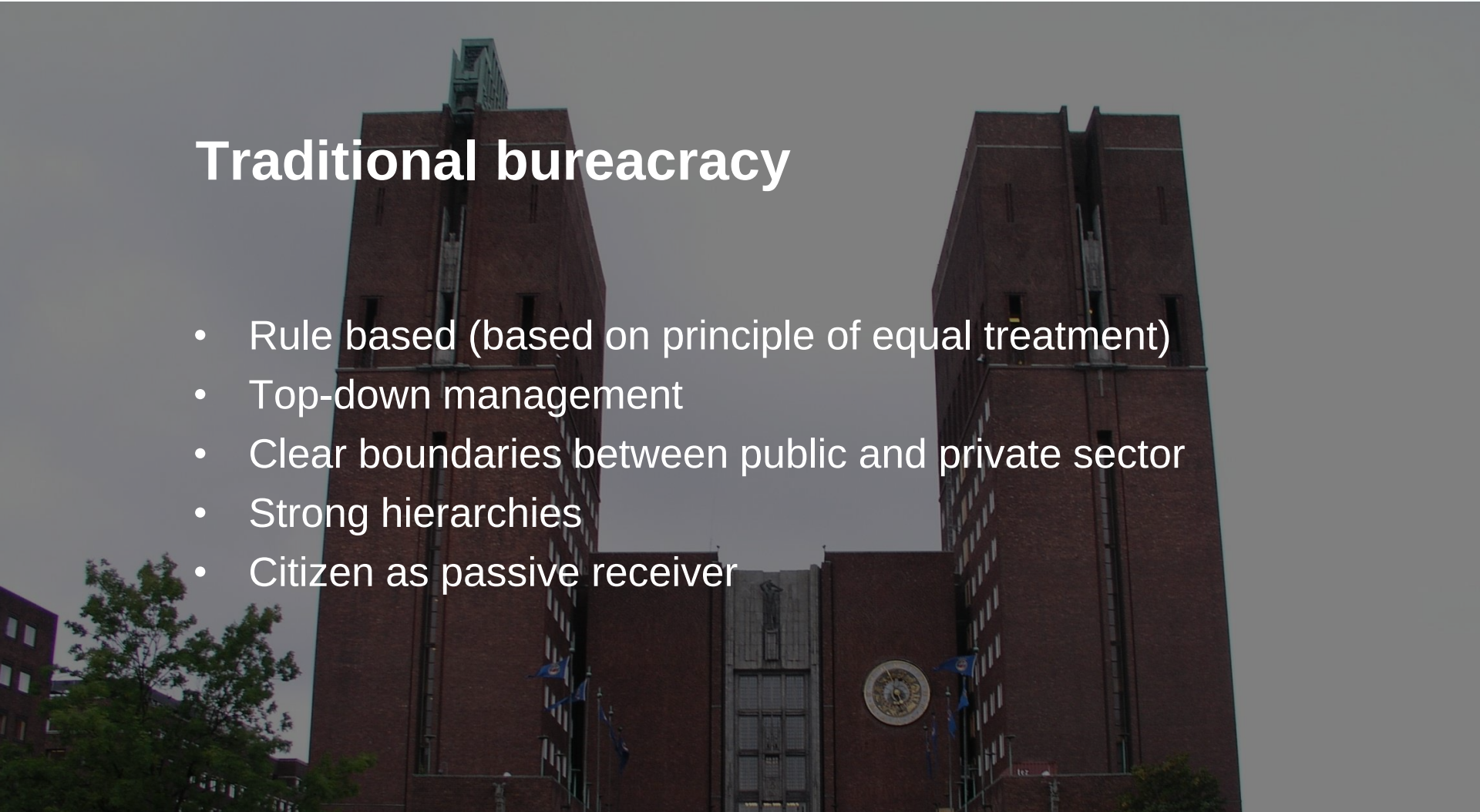


Broadband coverage; Ownership to data

Waste hierarchy aims; PAYT; Waste prevention agenda

Three governance regimes in the public sector (Hartley 2005)

- Traditional bureaucracy
- New Public Management (NPM)
- Networked governance

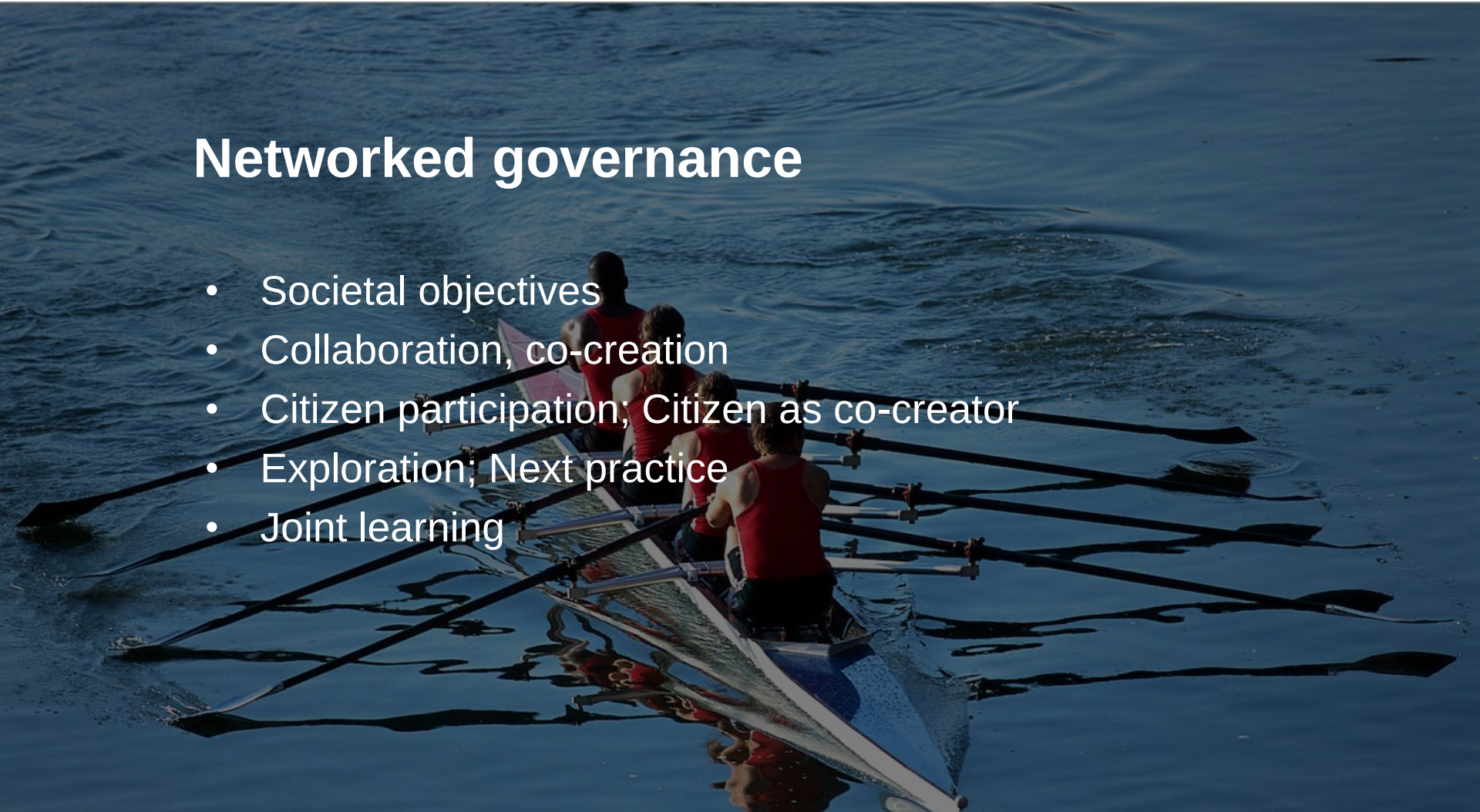


Traditional bureacracy

- Rule based (based on principle of equal treatment)
- Top-down management
- Clear boundaries between public and private sector
- Strong hierarchies
- Citizen as passive receiver

New Public Management

- Market based / competition / Transfer of characteristics from private to public sector
- Increase organizational efficiency
- Clear boundaries between policy formulation and service provision
- Outsourcing
- User orientation / Citizen as demanding customer



Networked governance

- Societal objectives
- Collaboration, co-creation
- Citizen participation; Citizen as co-creator
- Exploration; Next practice
- Joint learning

Conflicting expectations to public services and important conditions for innovation

Bureaucracy	NPM	Networked
Universal	Effective	Integrated
Democratic	User friendly	Coordinated
Traditional	Exploitation/ Best practice	Exploration/ Next practice
Rule based	Market based	Knowledge based
Solid	Cost efficient	Flexible

B

Illustrative case from Norway

Circular ambitions and achievements

Focus on sorting and recycling

New value chains from recycled materials

- Bio-fertilizer
- Biogas
- District heating

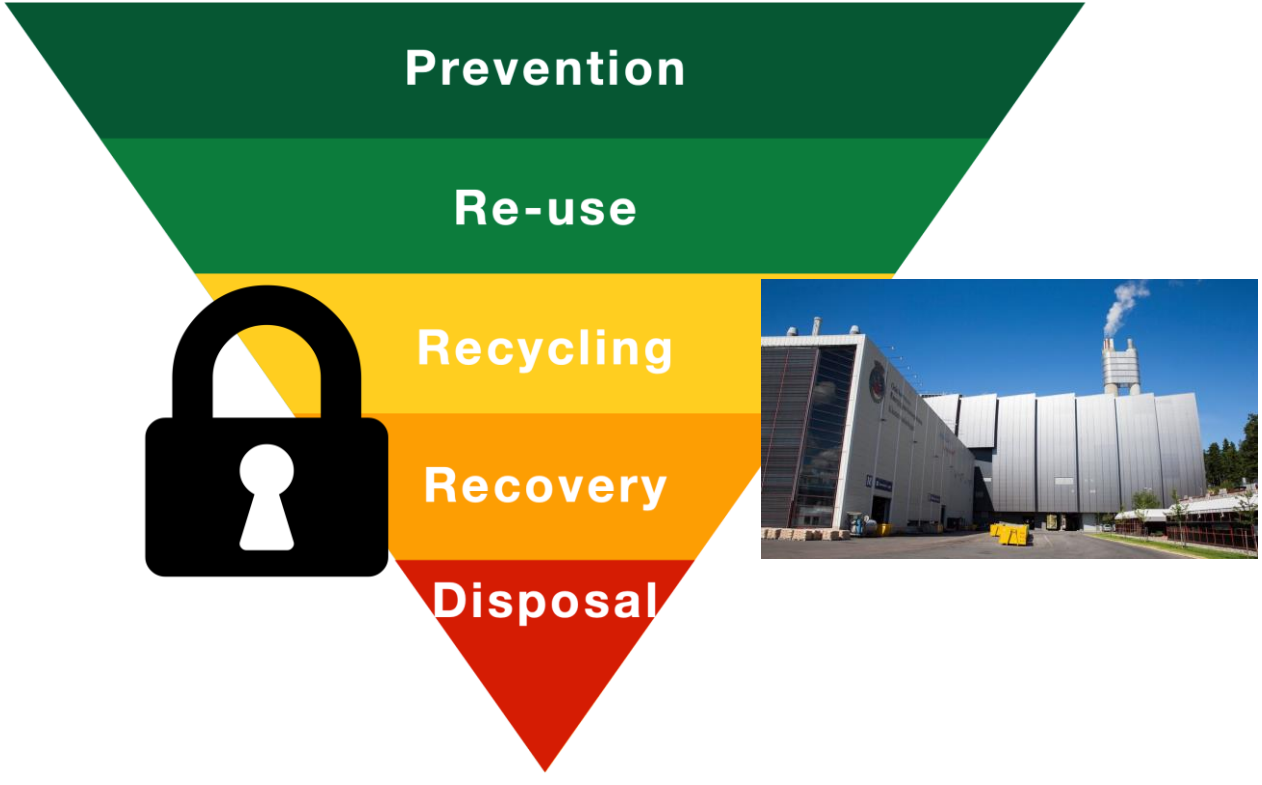
Investments in infrastructure

Optical sorting at Klemetsrud

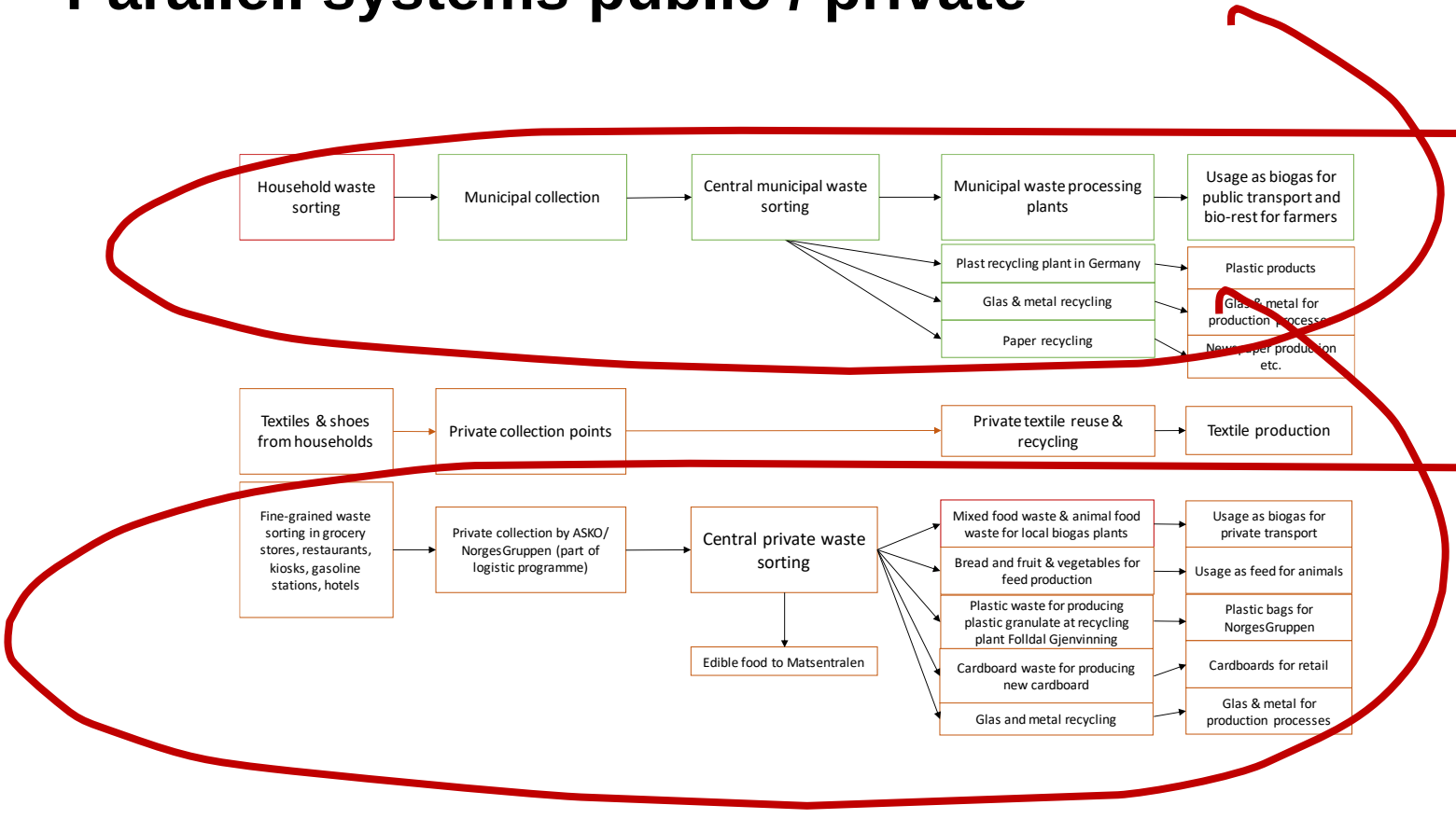
Biogas plant at Nes

Incineration plant at Klemetsrud

Investments in infrastructure cause lock-in



Parallell systems public / private



Siloes and path dependency

- Public and private sector working separately
- Public sector gives direction to innovation but organised in siloes and with respective mandates
- Public sector optimizing existing paths (sorting and recycling) rather than moving up in the waste hierarchy
- Industry and civic sector first to put food waste prevention on the agenda

C

Reflections on readyness and the road ahead

Not ready yet..

Actors / competence
- Fragmented sector
- 356 municipalities
- 87 renovation companies
- Diverse practices / 42% outsource services

Networks
- Silo-organisation prevents network effects
- Lacking ability for transformative change across public & private

Infrastructure
- Ownership > lock-in
- Prevents moving up the waste hierarchy

Institutions
- PPI > limited action space for innovation
- Inhouse or outsourcing? ‘Trench war’

Need to rethink how the sector is set up?

The road ahead

- Need to strengthen the sectors' capacity for transformative innovation
- Arranging for more coordination across public and private sector
- Need for new institutions to move beyond existing siloes
- Incentivize waste prevention through digital technologies and cost structure
- Possible tools in 'Transformative innovation policy' and 'Networked governance'

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Governance for system optimization and system change: The case of urban waste

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ABSTRACT

This paper analyses urban waste systems to explore how local authorities can resolve challenges related to climate change, urbanization and resource depletion. The paper investigates how different public governance regimes affect local authorities' ability to move upwards in the waste hierarchy. It identifies three different governance regimes – traditional bureaucracy, new public management and networked governance – and uses the insights from innovation in urban waste in three Norwegian city regions – Oslo, Drammen and Bergen – to illuminate how these regimes possess both strengths and weaknesses in how they affect system optimization and system change. The observed working practices signal that the issue of urban waste systems is perceived as a challenge of system optimization rather than system change. Viewing this as a challenge requiring system change would probably have ensured a stronger directionality and a broader anchoring of actors. Such an approach is likely to have arrived at a waste prevention mode earlier than the step-by-step-solutions implemented so far. The paper concludes that there is not one best governance regime, but a need to acknowledge their co-existence and carefully consider the characteristics of the respective regimes in order to arrange urban waste systems for long-term dynamic and sustainable city regions.

1. Introduction

More than half of the world's population lives in urban areas, and this proportion is increasing (Frantzeskaki and Kabisch, 2016). Urbanization, in parallel with population growth, has led to a transformation of rural land into urban areas, a higher consumption of natural resources and an increase in pollution and waste creation. Thus, urbanization presents a challenge for urban waste processing; waste must be managed and processed in such a way that energy is recovered, materials are recycled and reused, and waste is minimized. This challenge is already straining the abilities of many local governments, with food waste and waste from food-related products (e.g. food packaging and other non-consumable material associated with the food chain), causing huge environmental, economic and social problems (Mourad, 2016; Hodson and Marvin, 2010). In total, 1.3 billion tonnes of edible food are lost or wasted annually (FAO, 2011). Moreover, this challenge will only grow more demanding in the future, as worldwide waste production rises: it is estimated to double by 2025 (Hoornweg et al., 2013).

Although most urban areas face similar challenges, the ability of local authorities to handle waste efficiently and sustainably varies significantly – both within and between countries. The objective of this paper is to improve our understanding of why some local authorities are better than others at reducing, reusing and recycling waste; that is, ultimately, to treat waste more sustainably. In order to do this, local authorities need to introduce new and smarter urban waste systems. However, such large (urban) socio-technical systems are highly durable and path dependent, and in consequence, they are hard to change (Geels, 2002). A transition of urban waste systems implies changes in both production and consumption patterns, as well as in policies, technologies, institutions and business models. At the same time, such a socio-technical transition involves coordination across various types of actor groups and across several integrated sectors, such as energy, transport, agriculture and infrastructure (Davoudi and Evans, 2005; Weber and Rohracher, 2012; Uyarra and Gee, 2013).

This paper analyses innovation and sustainability in urban waste systems through the lens of public governance regimes. It identifies three governance regimes – traditional bureaucracy, new public management and networked governance – that influence how decisions, activities and involvement related to urban waste are made and carried out by local authorities. The paper discusses how the three governance regimes possess strengths and weaknesses in terms of "system optimization" and "system change", where system optimization is understood as changes that improve the sustainability or cost efficiency of an existing waste system, and system change is understood as changes that

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