Shifting Infrastructure Landscapes in a Resilient Circular Economy

Dr. Mendel Giezen, 29-03-2022

source: Mendel Giezen

Circularity, Resilience and Infrastructure

CE: separation and recombination of material streams
- Plastic -Water -Electricity - Biomass- Knowledge - Metals Etc.

Infrastructuur is crucial

Facilitates and limits

Circularity has two main infrastructural shifts
- shift towards distributed technologies and networks
- shift of infrastructure governance and responsibilities
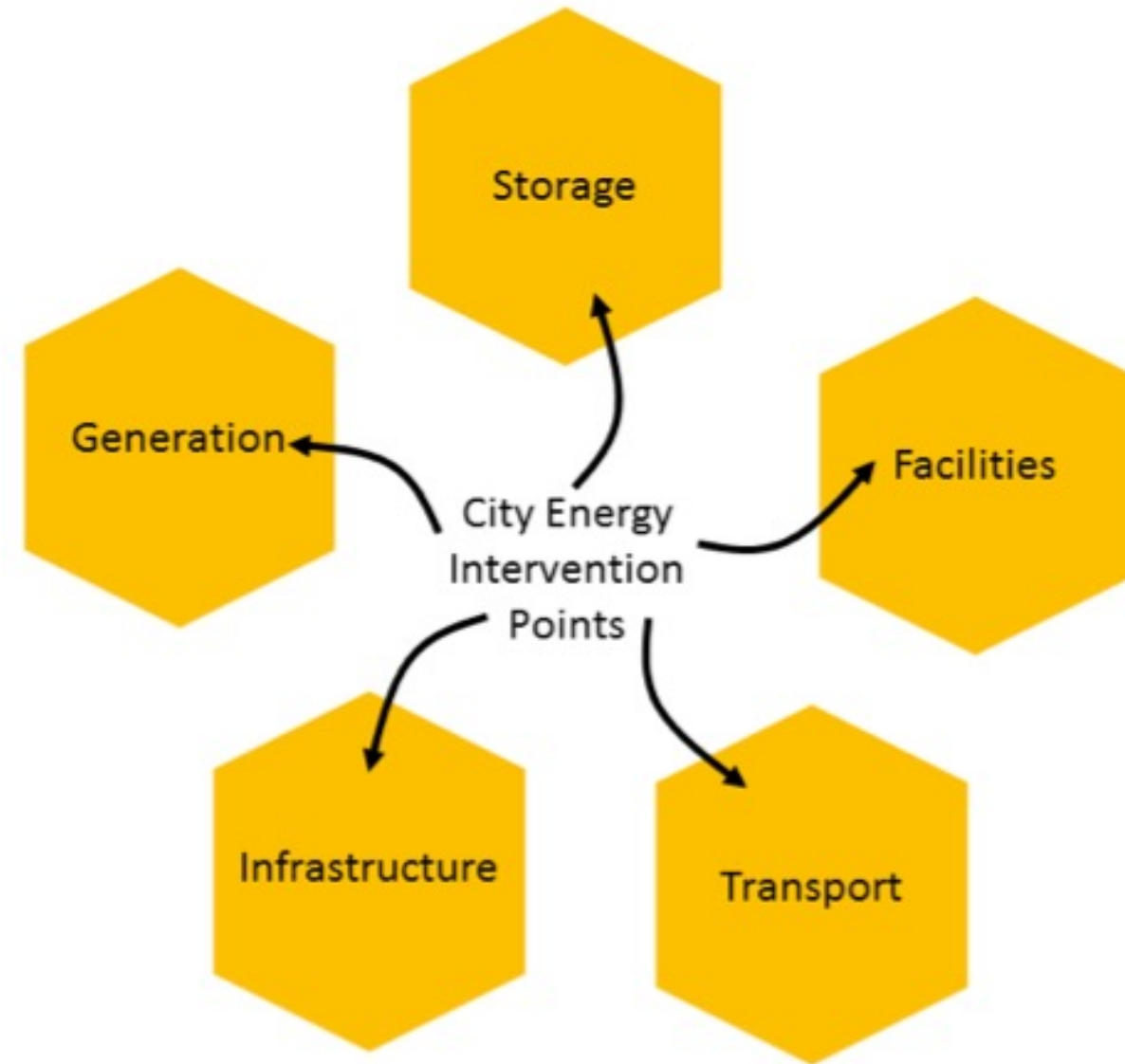
Shift 1
Shift from centralized to distributed networks

source: Mendel Giezen

Shift from centralized to distributed networks

New techniques are often distributed and fluctuating

- Solar Panels

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- Phosphate en resource retrieval

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Shift from centralized to distributed networks

New techniques are often distributed and fluctuating

- Solar Panels
- Wind Mills
- Biodigester
- Residual Heat
- Compost
- Phosphate en resource retrieval
- TEO/TEA/TED (English:TES/TEW/TED)

Shift from centralized to distributed networks

Problems:
- Scales
- Fluctuation
- Costs centralised system vs right to use own solution
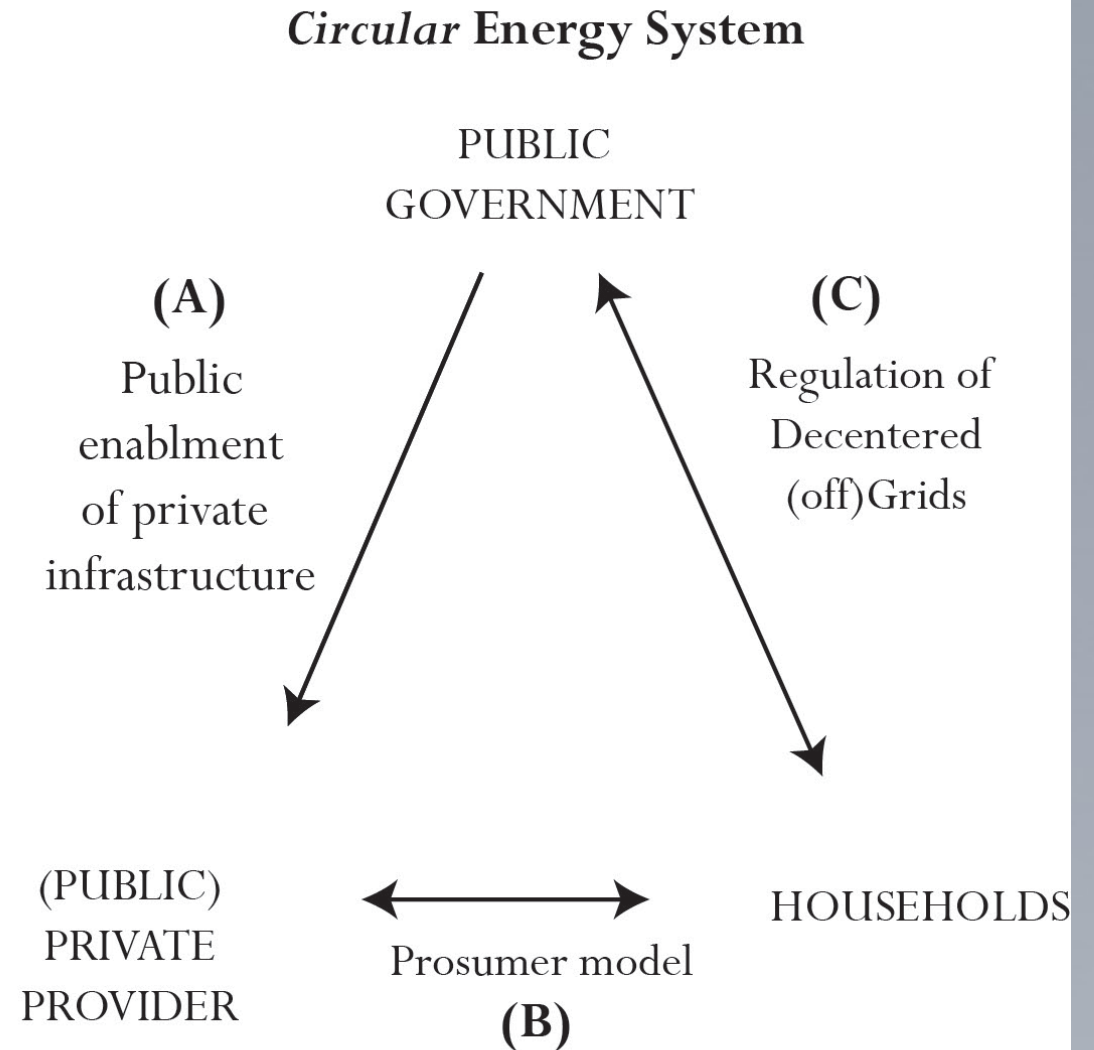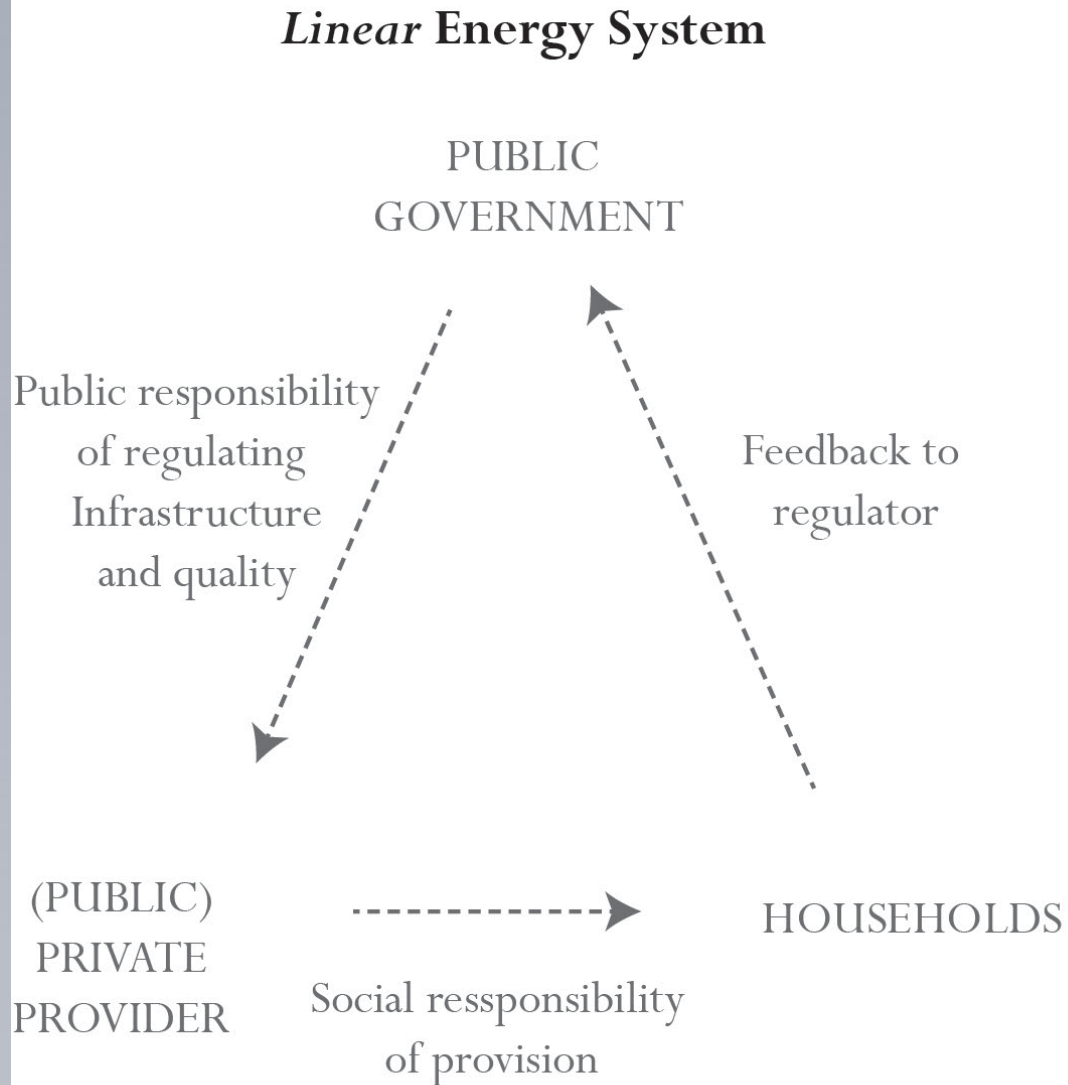- Linking of different techniques

Shift 2
Changing governance set ups of utility (public) services

source: Mendel Giezen

2. Changing governance set ups of utility (public) services

Linear Energy System

PUBLIC GOVERNMENT

Public responsibility of regulating Infrastructure and quality

Feedback to regulator

(PUBLIC) PRIVATE PROVIDER

Social ressponsibility of provision

HOUSEHOLDS

Circular Energy System

PUBLIC GOVERNMENT

(A) Public enablment of private infrastructure

(C) Regulation of Decentered (off)Grids

(PUBLIC) PRIVATE PROVIDER

Prosumer model (B)

HOUSEHOLDS

ndel Giezen

Shift in roles and Responsibilities

Quality

Security of Deliverance

Maintenance

Capacity

Interaction between systems

Differences in law and planning systems

Organisational

Shift in relations between actors

source: Mendel Giezen

Understanding the Field of Responsibility

Self-Efficacy

Formal – Individual Responsibilities
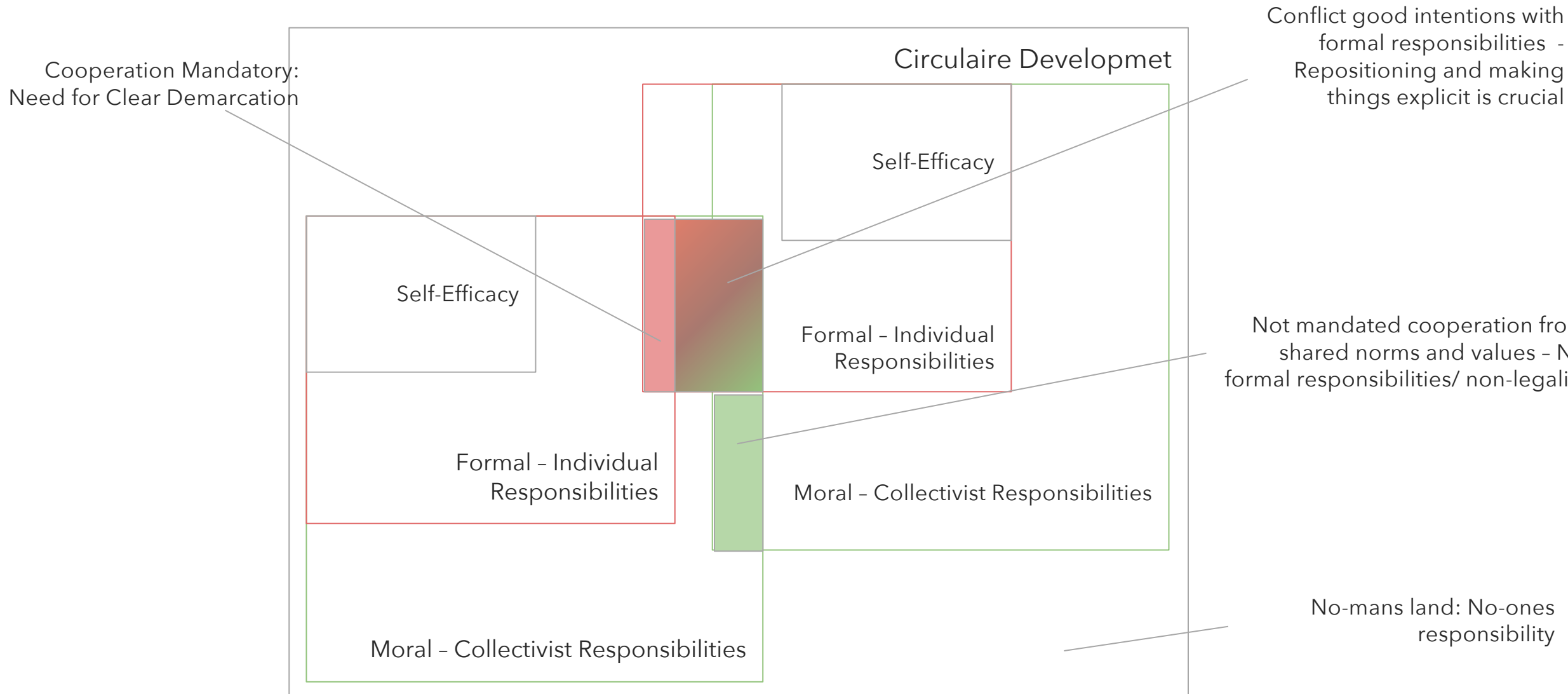
Moral – Collectivist Responsibilities

Self-efficacy: How important does an actor consider itself and its resources

What is expected of an actor and what does the actor consider its formal responsibilities

What is morally expected from an actor and what does the actor expect itself to be morally responsible for

Understanding the Field of Responsibility

Circulaire Developmet

Cooperation Mandatory:
Need for Clear Demarcation

Conflict good intentions with
formal responsibilities -
Repositioning and making
things explicit is crucial

Self-Efficacy

Self-Efficacy

Formal – Individual
Responsibilities

Not mandated cooperation fro
shared norms and values – N
formal responsibilities/ non-legali

Formal – Individual
Responsibilities

Moral – Collectivist Responsibilities

No-mans land: No-ones
responsibility

Moral – Collectivist Responsibilities

Lawrence & Suddaby

"Institutional Work: Actors and Agency in Institutional Studies of Organizations" (2009)

-Evolution in Institutional Theory

-Institution: 'an organized, established procedure' that reflect a set of 'standardized interaction sequences'.(p3)

-The product of specific actions taken to reproduce, alter and destroy them

-Conscious and Unconscious

source: Mendel Giezen

4 main types of Institutional Work

4 main types of Institutional Work

-Enabling Work

-Constructing Identities

-Constructing Normative Networks

-Changing Normative Associations

source: Mendel Giezen

Enabling Work

Water

No business case for drinking water

Accommodation of innovation driven by the technological sublime

Energy

Business case for many distributed technologies clear (Windmill, Solar, etc)

Accommodation of innovation driven by sustainability ambitions and expected inevitability

Enabling Work

Heat is a currency between Water and Energy

-Particular thermal heat from water flows

    - Space and time matter - Close by

    -Adaptable and responsive heat/energy grid

Redesign of the energy network to accommodate new distributed systems (Liander)

    -More expensive than the traditional system (Why?)

Redesign of the municipal heat grid to open grid (Municipality)

    -Allow multiple suppliers and consumer choice

    -More expensive

Introduction of thermal water solutions near or in households (Waternet

    -Reduction of energy cost households

    -Whose responsibility is this then?

Constructing new identities

Circularity requires a redefinition of what it means to be infrastructure provider

-Integration of departments within the organisation

-Interaction with other organisations (e.g. thermal energy from water)

-Who is responsible for quality and service security (e.g. drinking water or electricity)

-From provider to network organisation, from provision to enabling

Constructing Normative Network

Circularity requires the alignment of multiple actors

-creates an interdependency between actors across fields

-How to include all citizens? (Is it necessary, remain for specific groups?

Response to perceived external pressure

-Self organizing citizens (in the NL the participation society)

Constructing networks is done through experimentations

Changing Normative Associations

Circularity requires new associations

-Separate minerals from feces - are people willing to change their behaviour

    -Mimicry potential

    -Expectation of government to provide

-Smart grids require loss of civil autonomy

-Within the organisations a move from the engineer perspective to a co-creation perspective and the acceptance of tacit layman knowledge.

# Placing the results in a Social Systems Boundaries perspective

Internal reorganization in response to changes in Transactional and External

-Reconstructing identities

-Changing Normative Associations

Focus on the Transactional

-Constructing normative networks

   -integration as requirement for CE

Passive Acceptance of the External

Internal   Transactional   External
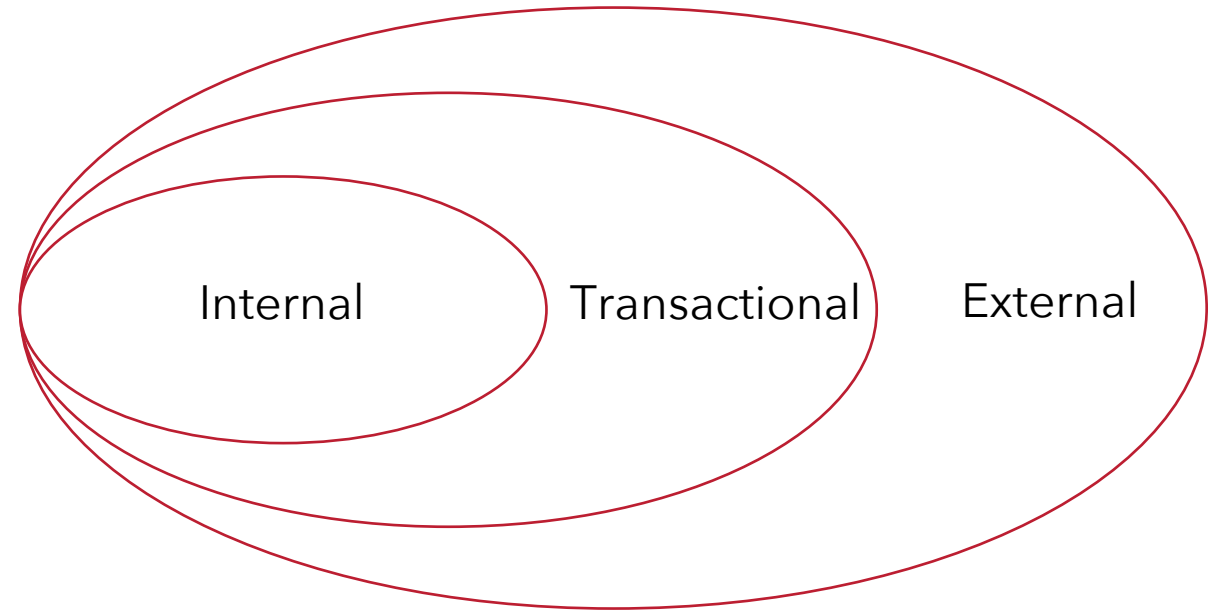
Conclusions

Active Work of Institutional Restructuring in Infrastructure Governance in response to CE and Resilience

There is a need to understand the field of responsiblities to identify shortfall, overreach and possiblities/necessities for cooperation

Most work aimed at internal system in response to (expected) shifts in transactional and external environments

The increase in decentralized solutions do not only lead to technological challenges but also to organizational ones. New roles and responsibilities

Generating knowledge and the creation of networks through projects of experimentation are crucial at this phase of the transition