

Sustainability Research Institute

FACULTY OF ENVIRONMENT



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The role of governance in accelerating transition towards more integrated, service-oriented infrastructure operation

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Igov Workshop

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Engineering and Physical Sciences
Research Council



Current infrastructure operation challenges:

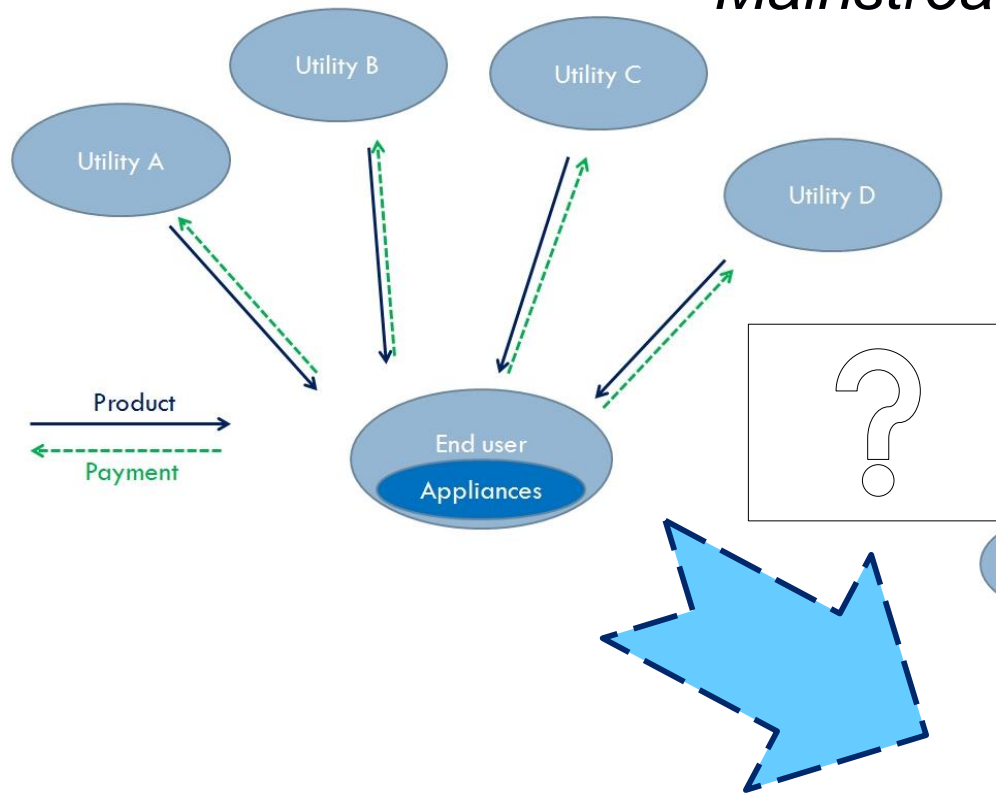
1. Governance based on **unmanaged growing demand** is both inefficient and unsustainable;
2. Current design and operation **do not integrate the end-users**, in terms of their crucial role in selecting and using technological options, and the variety of their wants and behaviours; and
3. **Separate and parallel delivery** of different infrastructure streams prohibits the development of potential joint solutions, or even substitutions, between infrastructure systems.

Aim & objectives; “Towards MUSCoS”

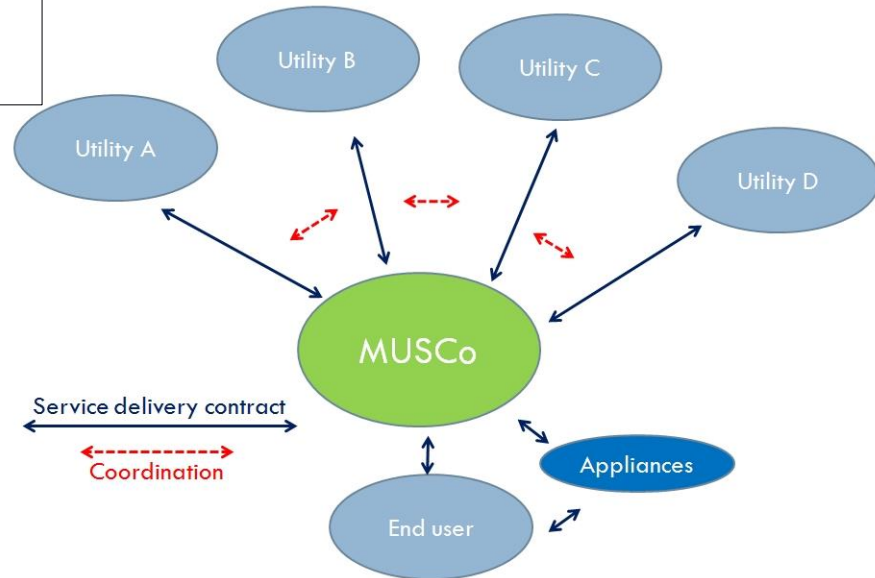


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Mainstream



Alternative



Case Studies



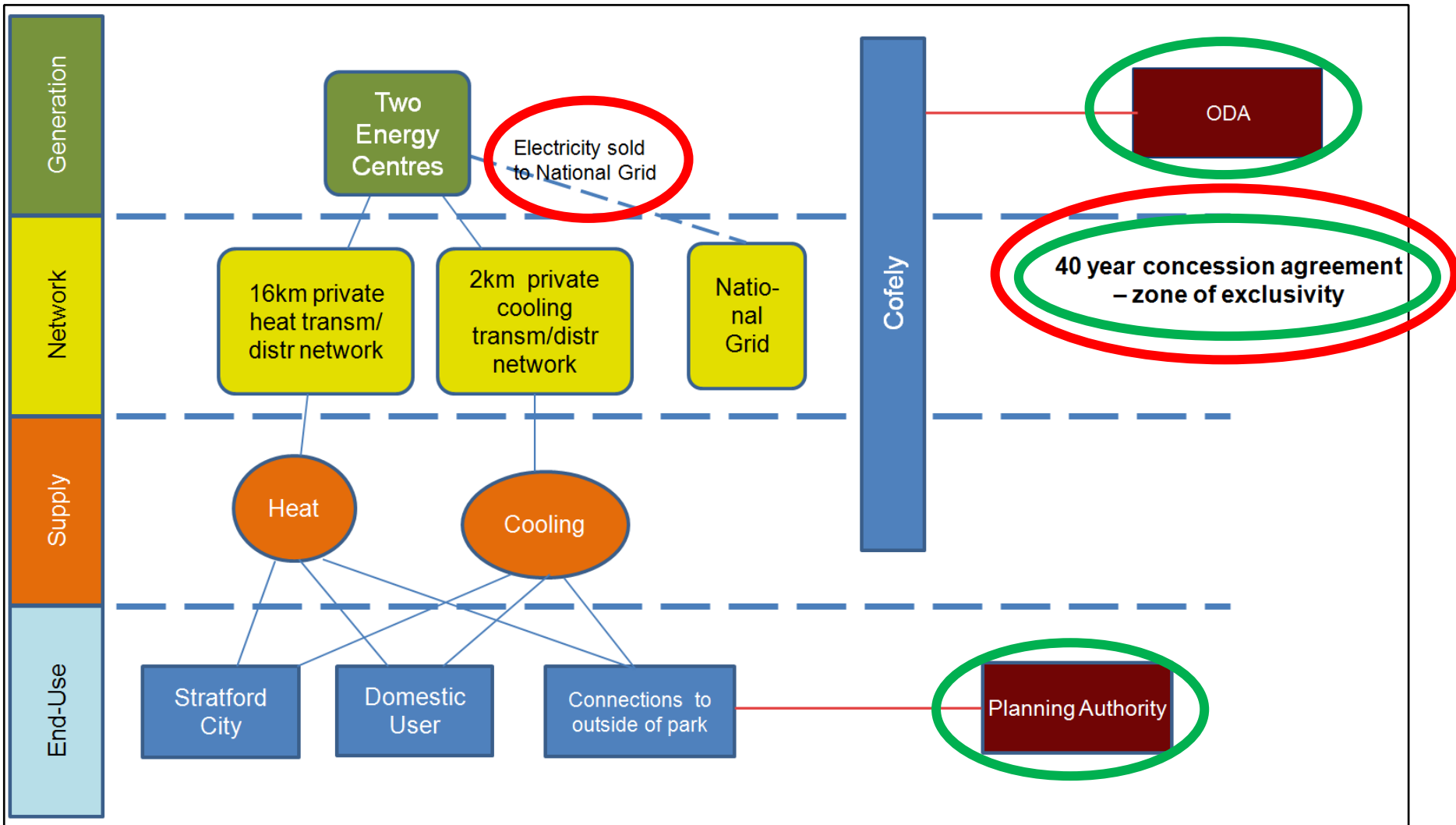
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Case Study	Key features (including main technologies)	Location	Utility Sector	Initiator
Woking Borough Council	A Special Purpose Vehicle, retrofit of council property savings recycled to finance low carbon energy generation (via CHP) and retrofit of social housing.	Woking	Energy	Local Authority
Olympic Park Energy Centre	The largest CHP Plant in the UK providing heat to the Olympic park. Commissioned by Olympic Development Agency to meet sustainability goals.	London	Energy	Government Agency
Yorkshire Water Water Saving Trials	Water company funded water saving device roll out. Pilot trial to provide evidence on water saving potential and demonstrate action on demand management.	Scarborough and Wakefield	Water	Utility Company
Kimberley Clark Water Recycling Scheme	“Long loop” recycling of effluent from paper mill re-used as process water following intensive treatment. Novel financing mechanism (piggy-backing on a high payback scheme).		Water	Private sector
Eco-Island	Retrofit and low carbon energy schemes. Instigated by Eco-Island Community Interest Company (CIC). Operation of energy generation (small scale wind, CHP and smart grid) will be undertaken by an ESCo run in partnership with the CIC.	Isle of Wight	Predominantly energy	Community Interest Company
Welborne	Proposed development of 3,000 house and employment land. Proposed management of properties updating and infrastructure by the community that occupies the site.	Portsmouth	Energy, Water, Transport	Landowner

Data collection



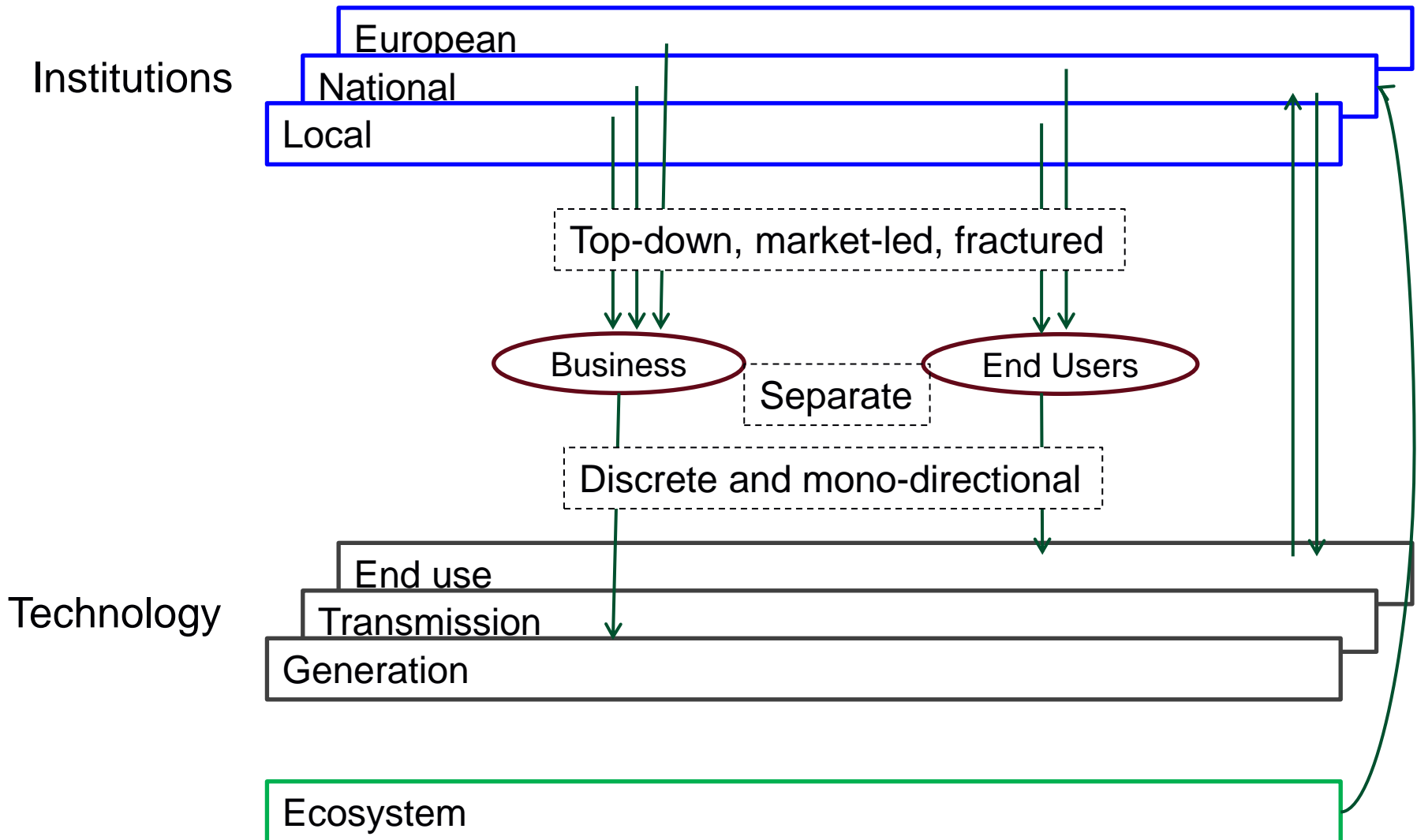
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- Infrastructure governance goes beyond utility governance
- Multiple participants: a key challenge, but also a key to success
- Integration of diverse actors
- Multi-dimensional relationships, multi-dimensional solutions
- Relationships are dynamic
- The importance of internal governance
- Systemic approach to technology change

How supportive is current governance?





Contribution

- Changing interaction between different levels of governance and the need to engage of non-governmental actors in policy development and delivery

Application

- The importance of developing a **common framing** of the problem. (Smith and Stirling 2006).
- The need to **engage multiple actors** in the process of innovation, knowledge production, infrastructure provision, communication and policy (Smith 2007).
- The need for national regulation to **allow innovation at different scales** and from different non-utility actors (Bolton and Foxon 2013).

Limitations

- Interaction of actors and technology
- Nature or structure of internal governance of partnerships



Contribution

- Identifies coevolving systems relevant for analysis of transitions

Application

- Coevolution can lead to the development of **joint structures** between different systems which may remain stable, and contribute to a long-lasting transition, or be disrupted by change at the micro or macro level, as well as internal dynamics
- When actors combine into joint structure there is a greater potential for them to interact with an infrastructure system in a **more integrated and effective** manner

Limitations

- Does not go far enough to describe how **internal rules could improve the stability** of joint structure



Contribution

- It is possible for communities to conserve and efficiently utilise jointly managed resources without the need for central governance.

Application

- Design principles to help understand the requirements of internal systems of institutions required to support self-governance.

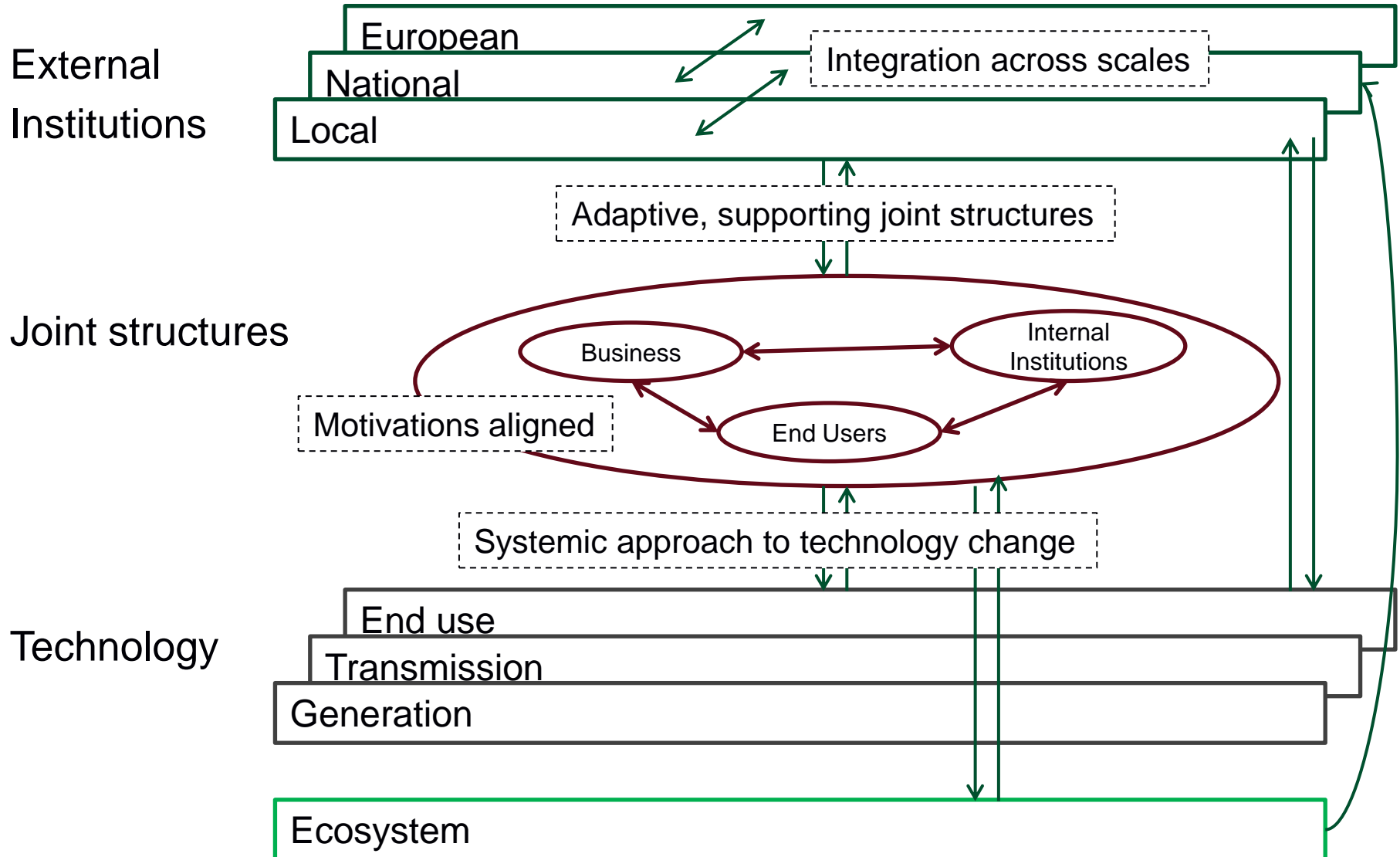
Limitations

- No application to infrastructure yet

Result – governance analysis framework



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Further develop our understanding of the **joint structure**, and in particular the nature of **internal institutions** required to support self-governance of infrastructure.

Undertake **modelling of specific parts** of the framework to examine the consequences of proposed alternative approaches for infrastructure governance.

Apply framework to analysis of **integration between infrastructure systems** (such as water and energy) to identify how governance might support exploitation of cost and resource efficiencies resulting from infrastructure interdependence.



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Thank you for your attention!

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