IREK

Innovation and Renewable Electrification in Kenya

Conceptual Framework

IREK Workshop

Eldoret, February 2017

Simplifying and zooming in on the fundamentals

What are we studying?

- **Capability** development (**learning**)
  - Capabilities in *renewable electrification* processes in Kenya (What capabilities are in place? What were the learning mechanisms?)
  - Capabilities necessary for further 'developmental' advancement – including **shortfalls** in this regard. (What key capabilities did not arise?)
- **Interactive learning** as key focal point:
  - In projects, in systems and in connections to actors outside the system (Who interacts and how? What capabilities are developed and distributed?)
- Learning **for**:
  - Local job creation, manufacturing activities and service provision, project management and wider mastering/shaping of relevant technologies (What are the benefits and potentials of acquired capabilities?)

Our basic analytical framework?

Renewable electrification process

- Access to electricity
- Energy security
- …. benefits

Learning → Capabilities → Outcomes

Interactive learning

1. In projects
2. In NSIS
3. In GVCs

Intra-active learning

Within firms/ organisations

Technological capabilities

- In services
- In manufacturing

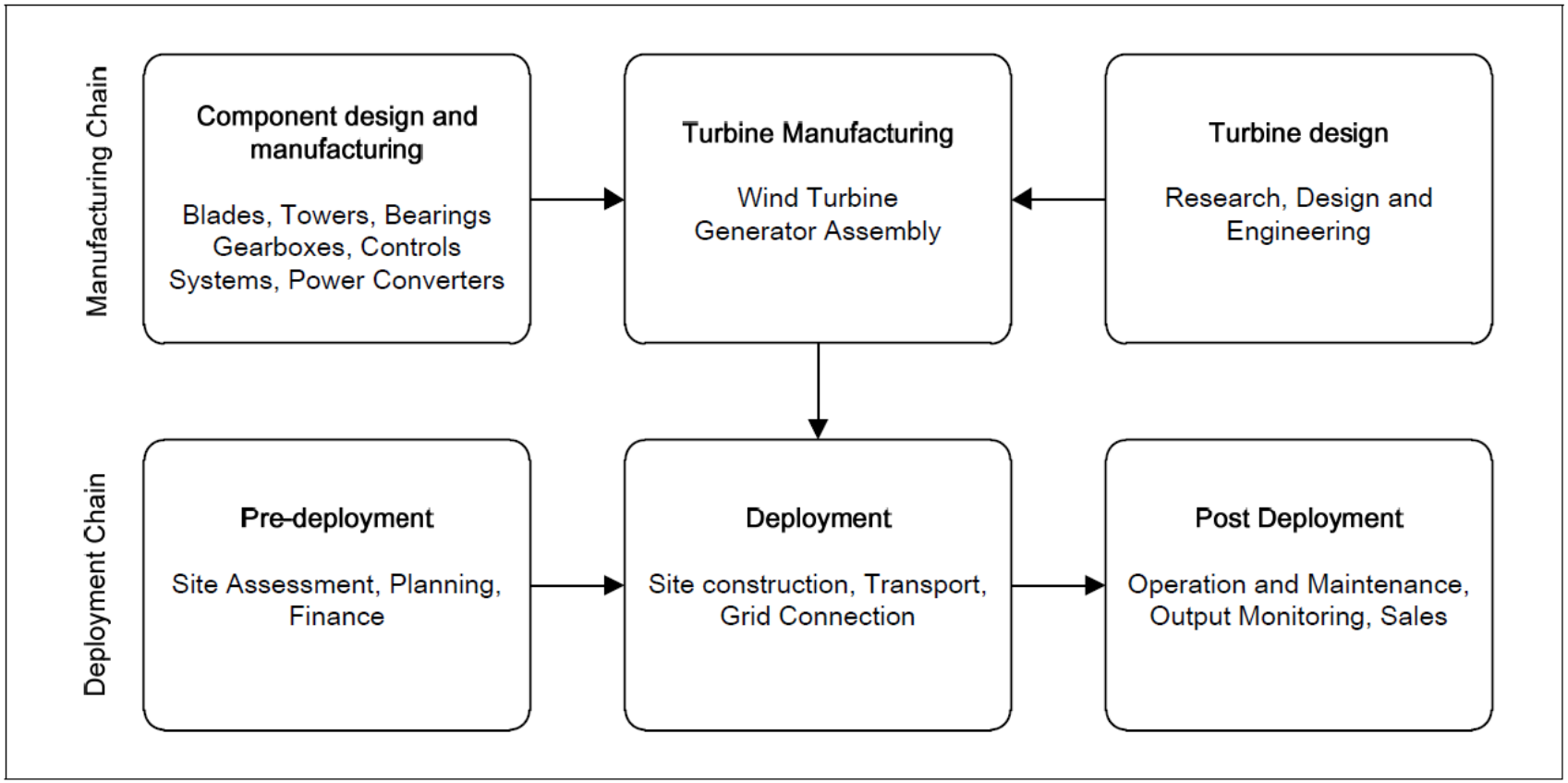
Capabilities that enable:

- Employment
- Local content
- Business opportunities
- New firms

More 'inclusive' and relevant electrification processes

Primary focus

What capabilities? Example of Wind



Broadening out again

Integrating research in the IREK project

- Ensuring ‘streamlined’ focus:
  - Same questions (next slide)
  - Same hypotheses (towards the end)
- Comparative analysis (middle bit)
- Shared publications
  - WPs
  - Books
  - Articles
- Collective process!
- What else?

Our primary empirical research questions?

1. Capabilities ← **2. Learning**

What is the nature and extent of capabilities?

Who has these capabilities?
What relevant actors do not have these capabilities?

How were these capabilities developed/acquired?

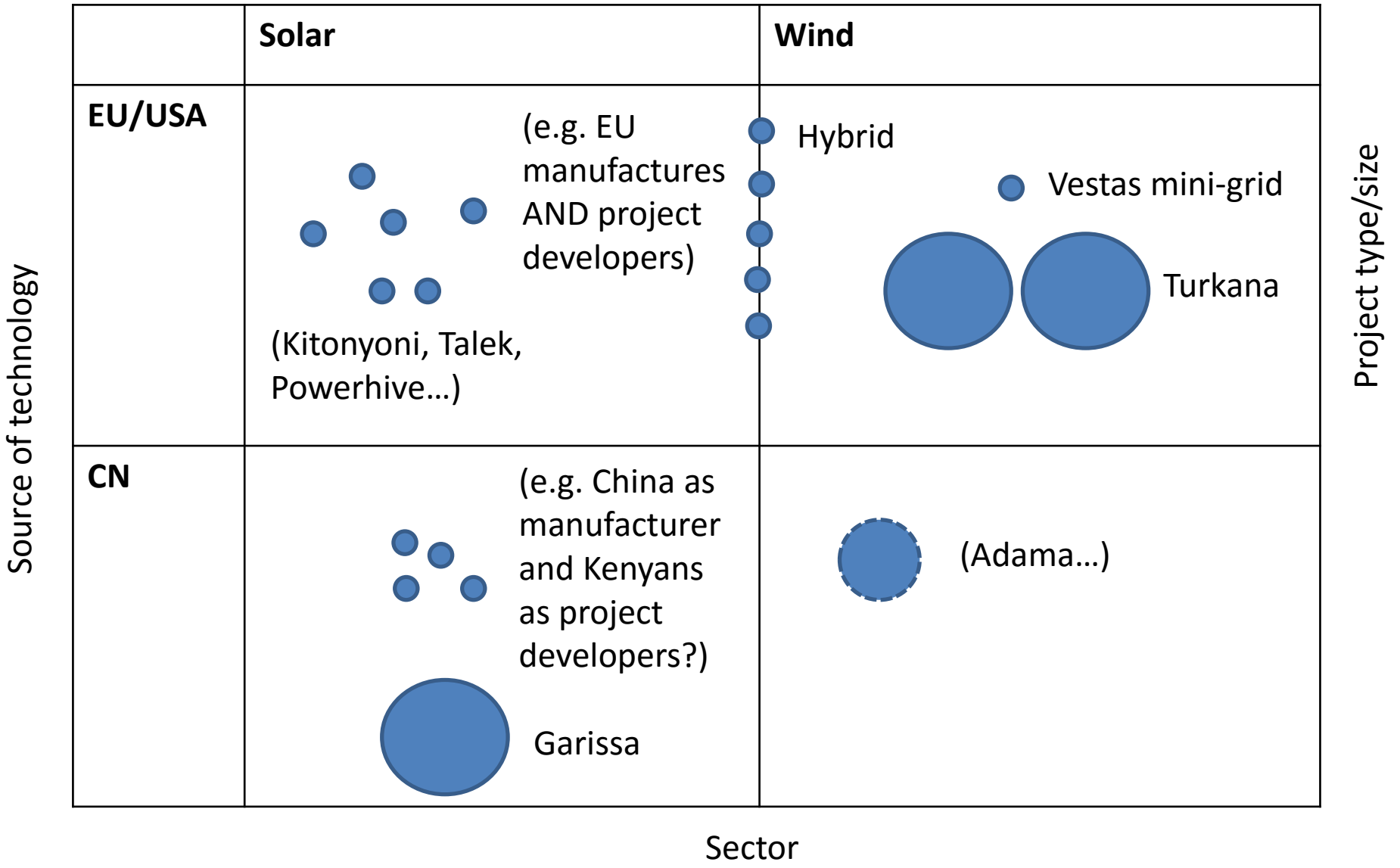
What was the role of different types of learning?

What were the learning constraints?

Comparative dimensions:

- Comparing technologies: Solar PW and Wind Power
- Comparing diffusion pathways: mini-grid vs. grid
- Comparing sources of technology and capabilities: Chinese vs. European vs. Domestic

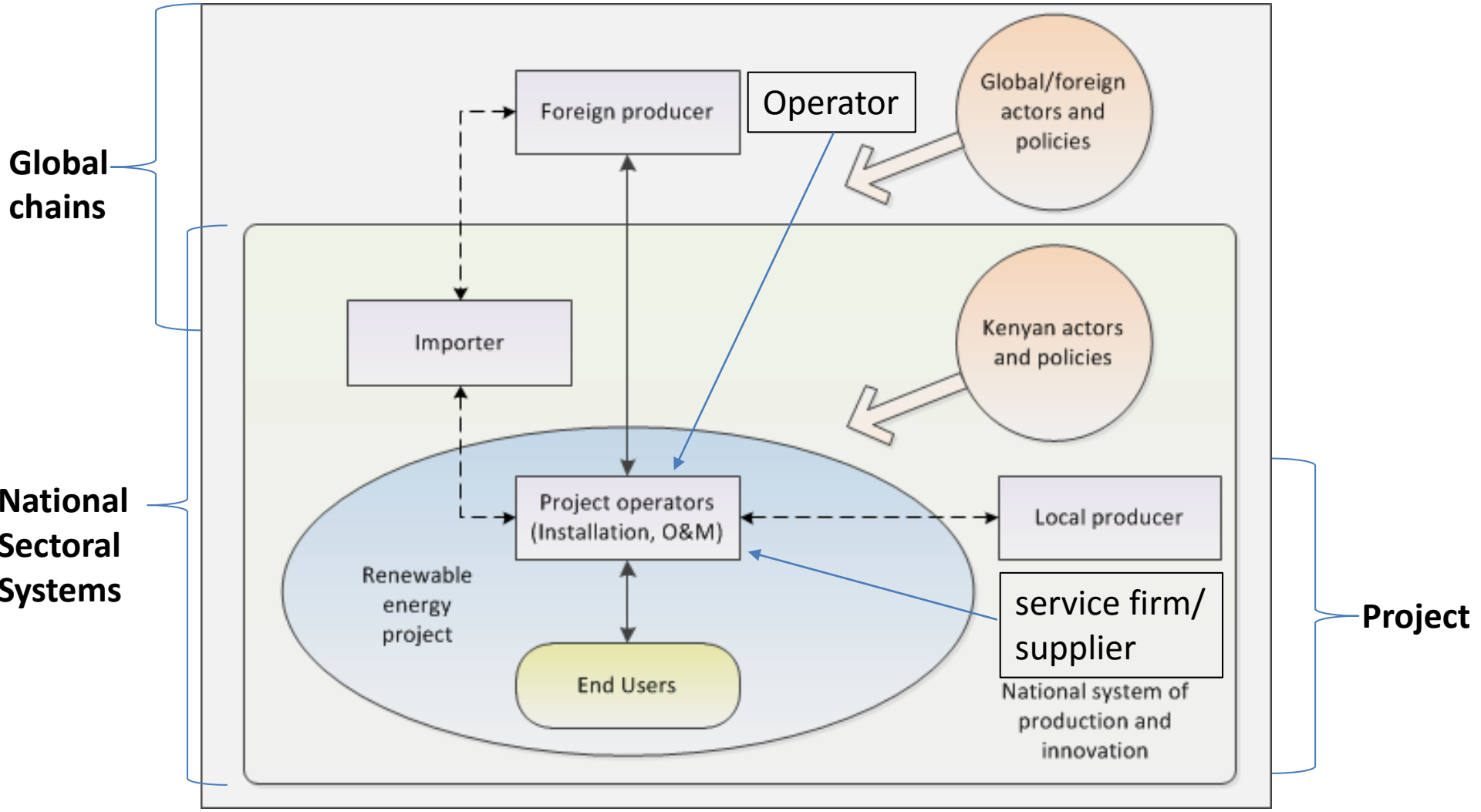
Comparing across three dimensions



Integrating analytical units and frameworks

- Projects
  - Organisational modes and actor constellations
  - Interactive learning in projects
- Innovation systems
  - Sectoral (sub)systems and system functions
  - Interactive learning among system components
- Value chains
  - Trade and investment centred value chains
  - Interactive learning among producers and (professional) users and suppliers

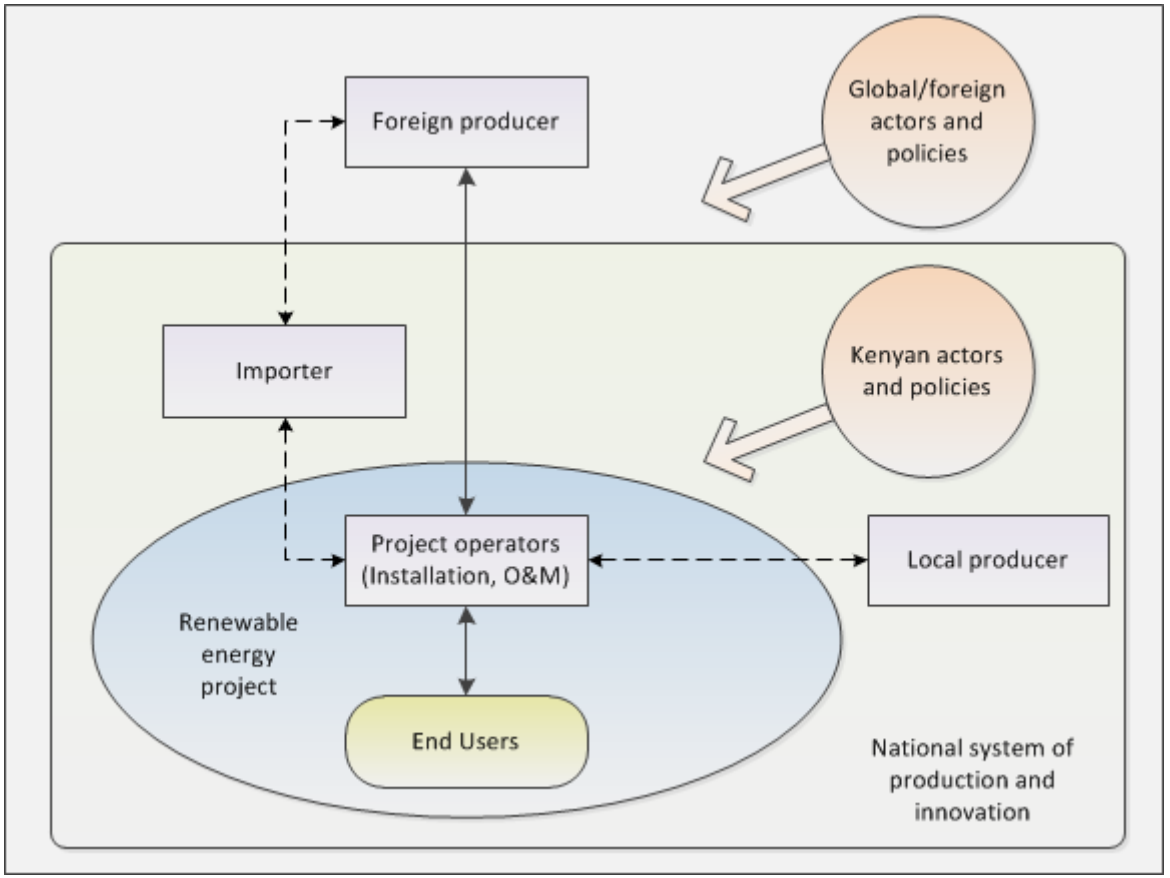
Interactive learning



Original and new hypotheses

Hypothesis 1: Outcomes depend on source of technology and producer strategy

Hypothesis 2: Outcomes depend on 'the transformative power' of the national-sectoral innovation



Hypothesis 3: Small is beautiful: Outcomes depend on size

Hypothesis 4: Outcomes depend on the local organisation of the project (including absorptive capacity)

First step: Working Papers

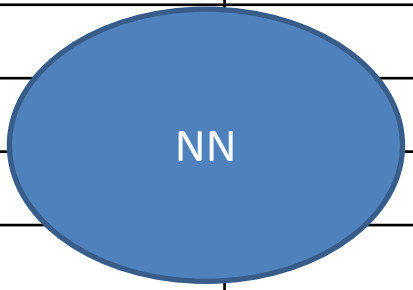
… to understand the setting for further studies and analyses

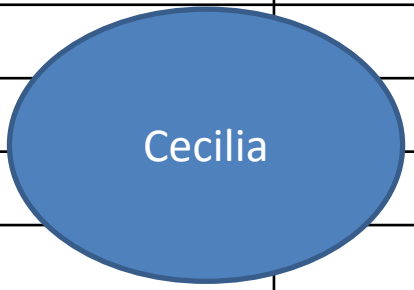
Key analytical dimensions to be studied at each level

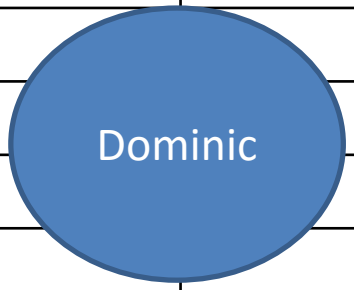
- **Actors and capabilities:** These are the firms and organisation directly and indirectly involved in renewable electrification and their various focal areas which are associated with their resources and capabilities
- **Flows and interactions:** These refer to inter-organisational flows of physical artefacts and services (input-output relations), financial flows and flows of embodied/disembodied knowledge
- **Rules and regulations:** These are both formal and informal rules of the game that structure behaviour by enabling and constraining

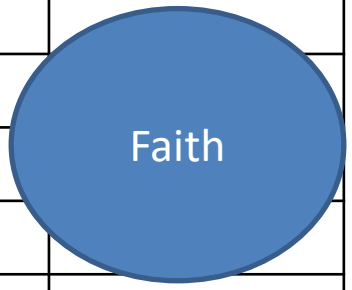
Working Papers

	Solar		Wind	
	Large-scale	Small-scale	Large-scale	Small-scale
Global level				
Rules and regulations				
Actors and capabilities				
Flows and interactions				
National level				
Rules and regulations				
Actors and capabilities				
Flows and interactions				
Project level				
Rules and regulations				
Actors and capabilities				
Flows and interactions				



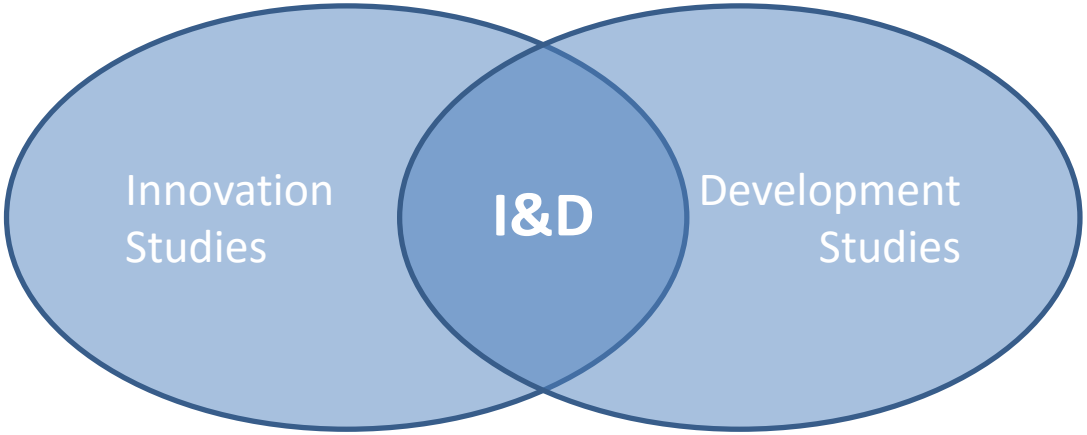






Going Beyond GVC and IS

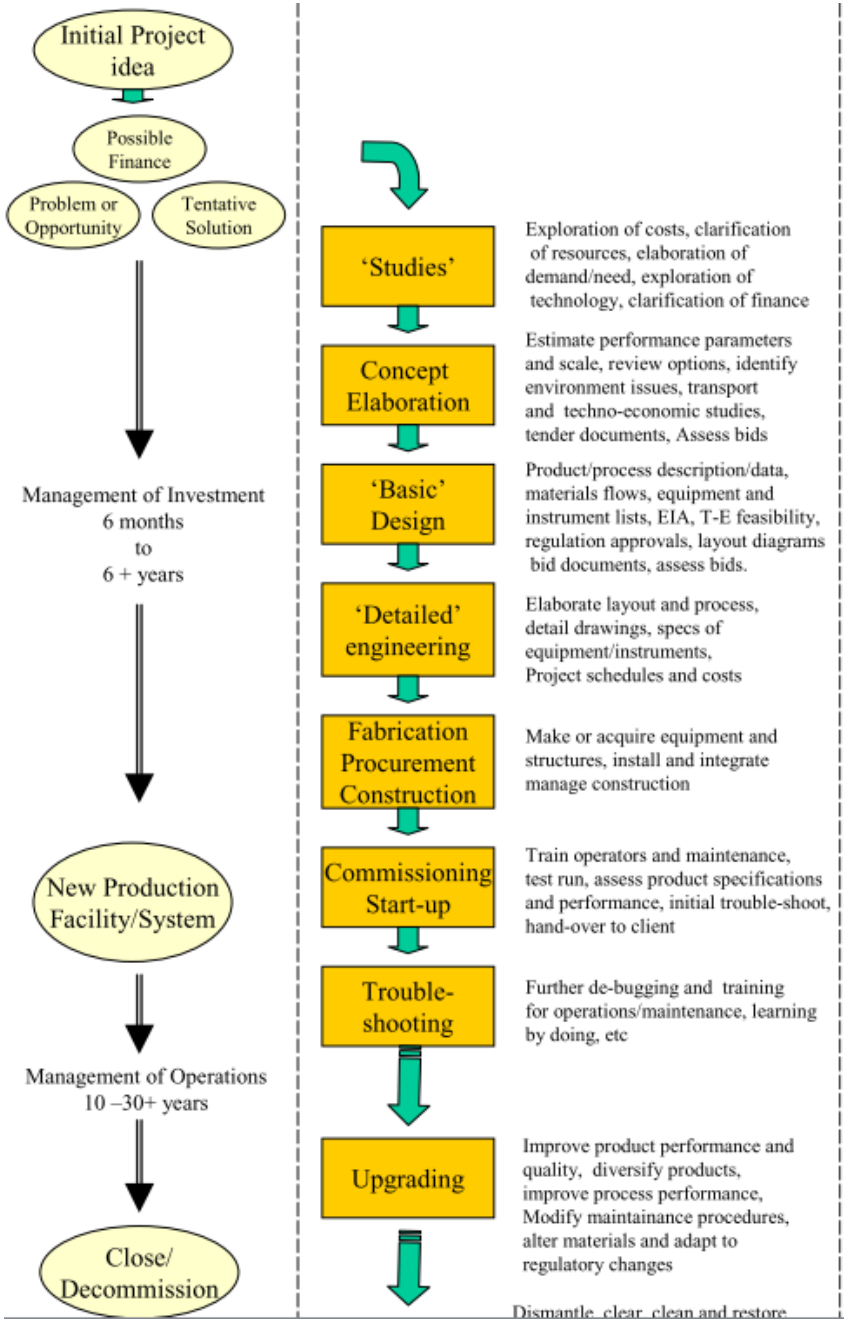
- Need to draw on other bodies of literature from the field of “Innovation and Development”



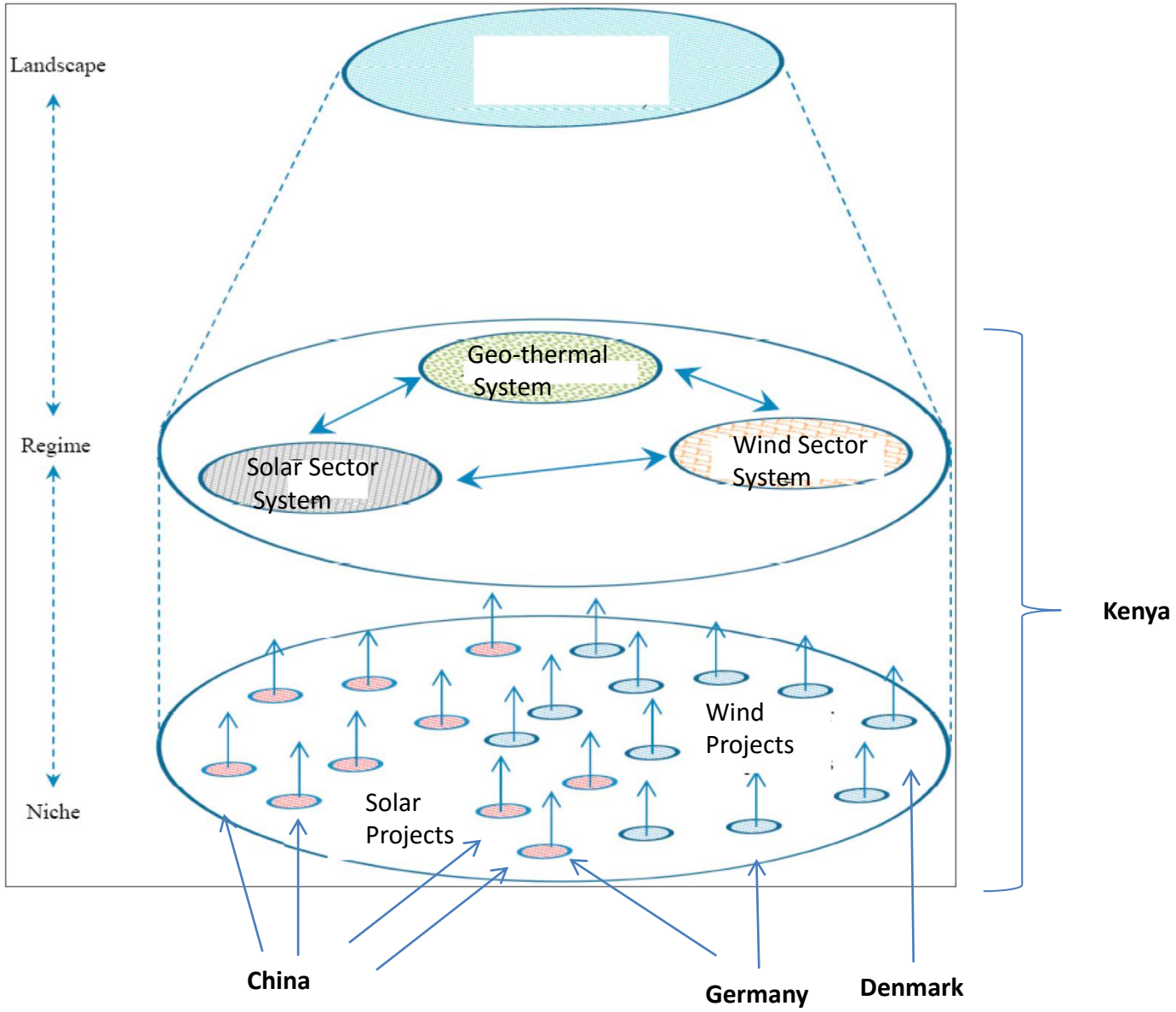
  - Drawing on capabilities literature, niche management, tech transfer, below the radar, appropriate technology…
  - Project-based innovation

Project-focused approaches

- Project management (Hobday)
- Design and engineering (Bell)
- Strategic niche management (Geels)



A theory of change: Projects contribute to system building (?)



Some questions for discussion

- How do we specify further boundaries of the ‘sectors’ we are studying?
- Can we specify further the various literatures that we will draw upon in the various studies? Can we limit ourselves to just a few bodies of literature?
- How do we define boundaries between the various ‘levels’ that we investigate?
- Are the prosed analytical dimensions in Section 6 the ones we want to use? Or are their better ones?
- Can we define typologies for actors?
- Can we define typologies for flows/interactions?
- Do we want to ‘institute’ further hypotheses such as those in Section 8?
- How do we operationalize our hypotheses? What are the key indicators?