Design of Energy Management Services

Supporting the role of the energy producing consumer

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Hanze University Groningen
Applied Sciences

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Agenda:

1. Context of research – developments in the energy industry
2. Research questions & objective
3. Research approach, strategy & instruments
4. Questions & discussion

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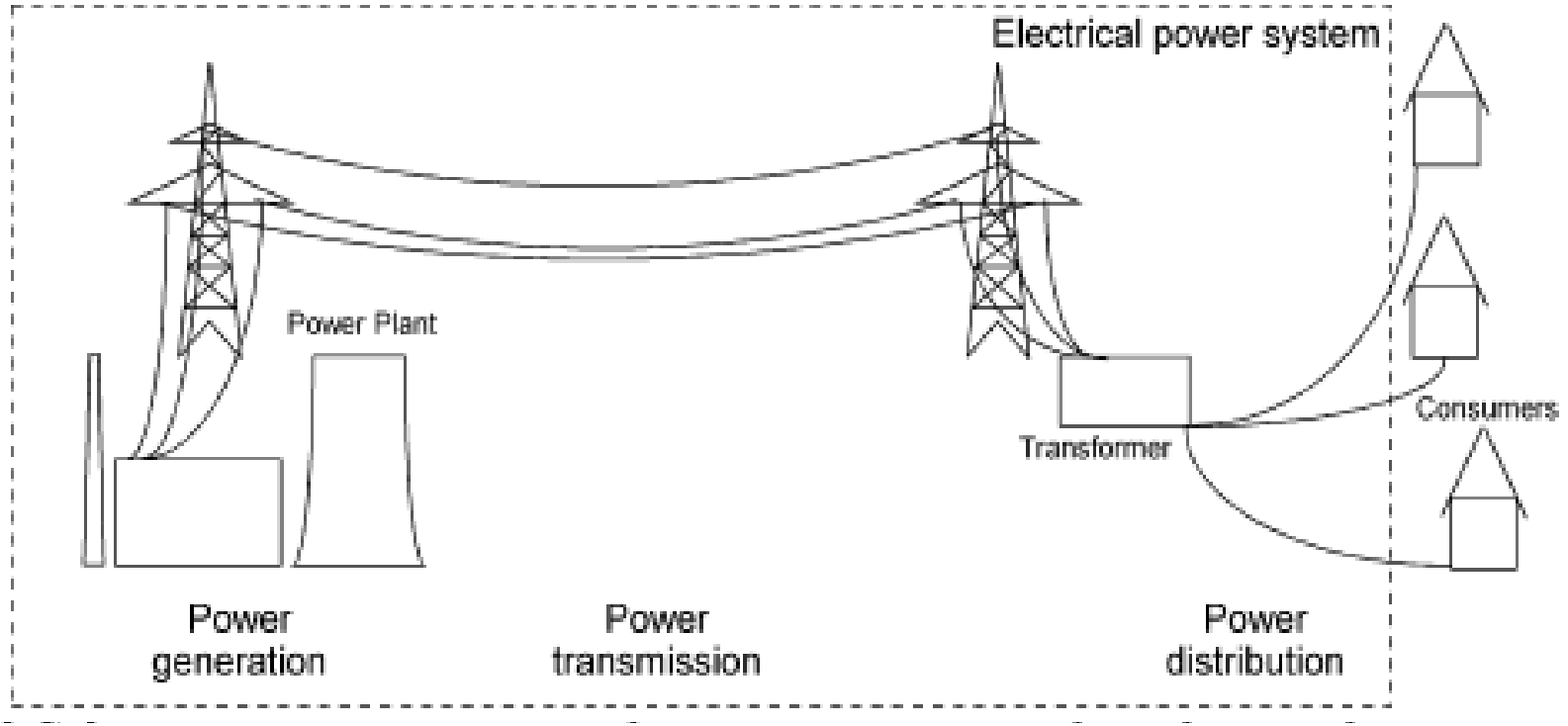
Context of the research

Current electricity infrastructure



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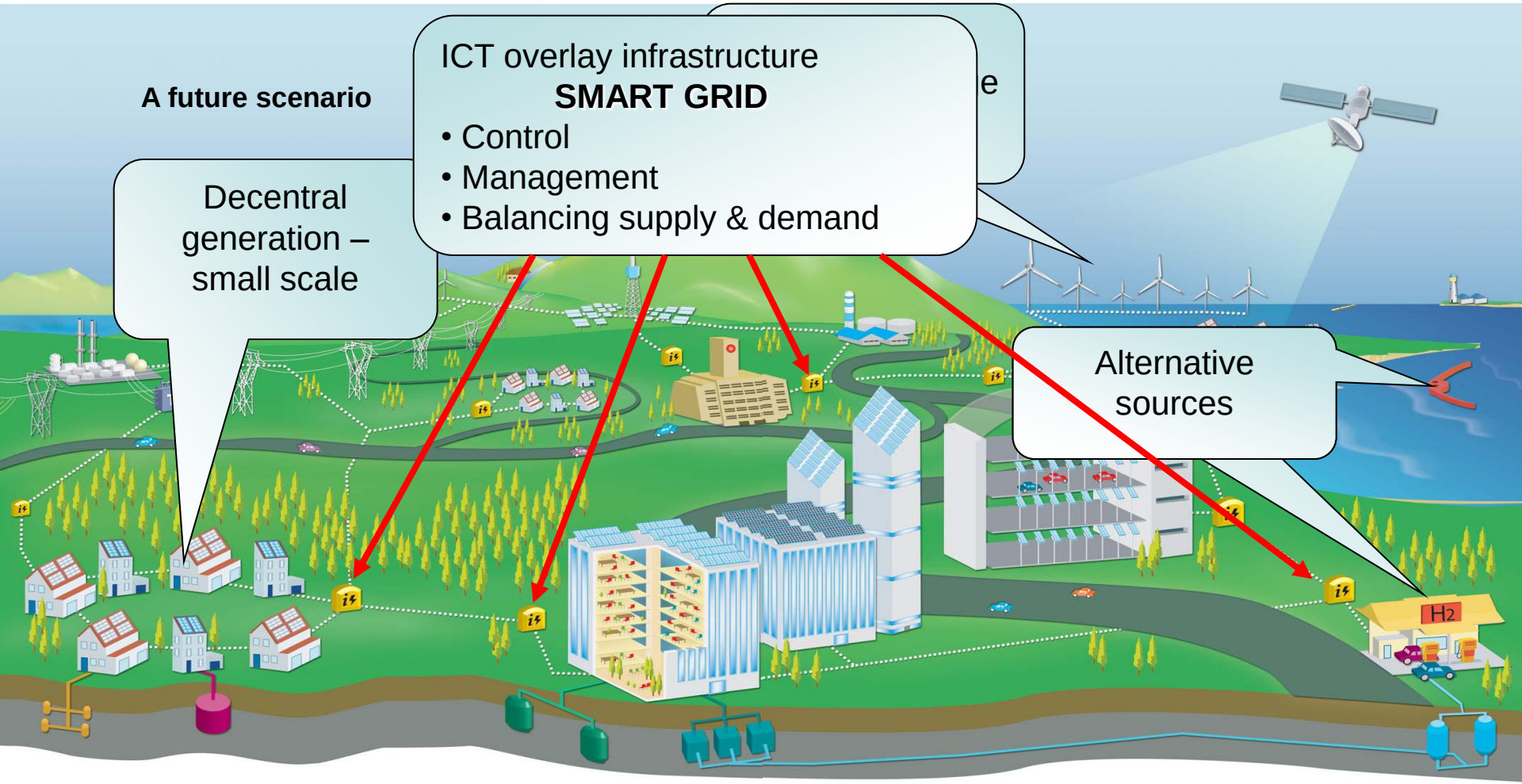
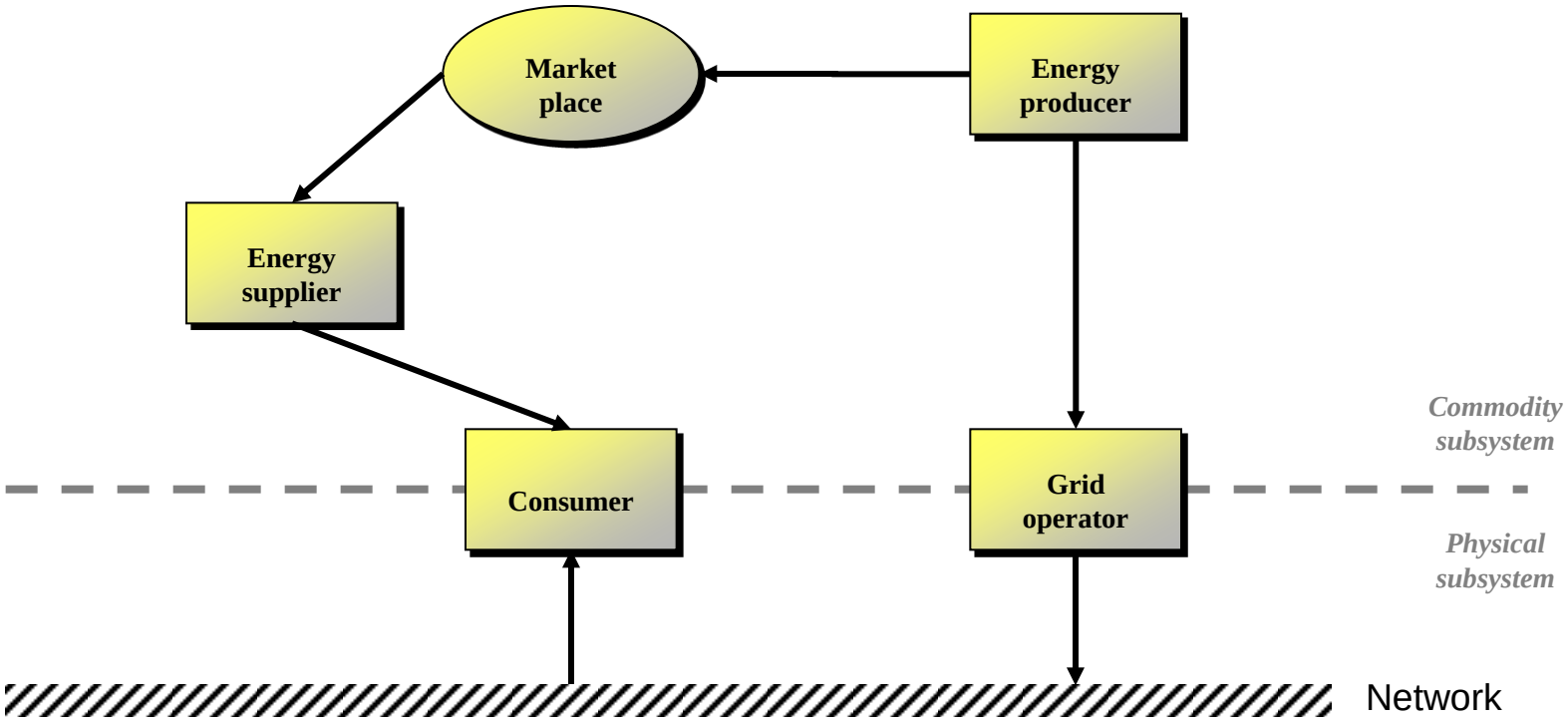
Context of the research

A future scenario

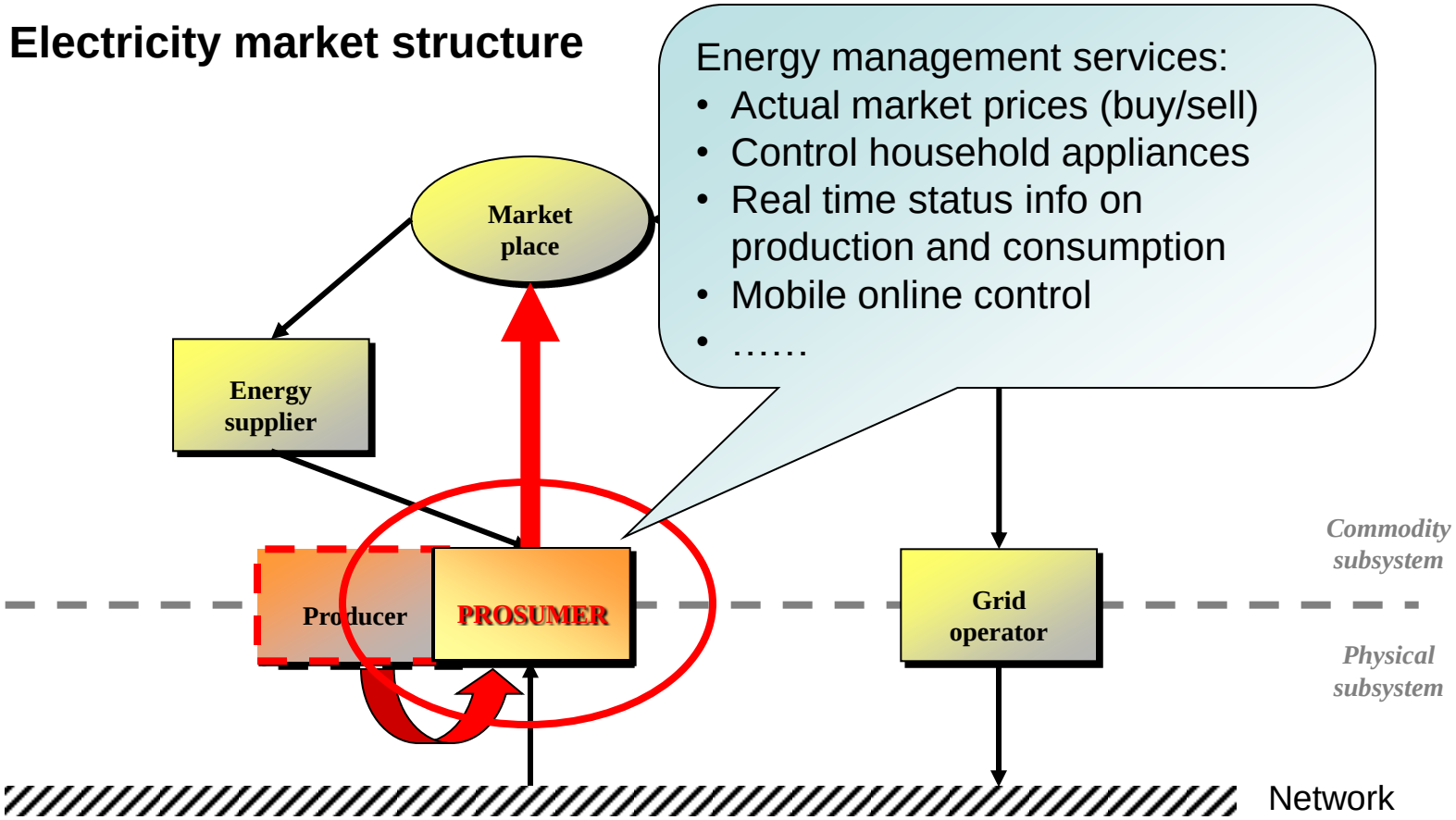


Source: European Smart Grids Technology Platform (EUR 22040)

Electricity market structure



Electricity market structure



Research question:

"How can actors in the energy value network design energy management services that support the role of the prosumer"

Sub-questions:

1. *How does the value network look like?*
2. *What are the requirements of the stake holders involved?*
3. *What are possible services that can support the prosumer?*
4. *What are current service design methodologies, and how do they perform?*
5. *What are critical elements when designing energy management services, and what are possible solutions?*

Research objective:

*"To develop and validate an **approach** for designing energy-management services for prosumers, which can be used to support actors in the energy value network to develop these services"*

Result:
- Suite of do's & don'ts
- Design guidelines
- Set of tools & methods

Added value?
- Time-to-market
- Failure rate
- Development costs
- Well fit for designers

Choice of research approach

Nature of research is ill-structured problem:

- Set of possible solutions is unlimited
- Solutions can not be derived from model of problem situation straight forward
- Effectiveness and efficiency of courses of action hard to evaluate numericaly

=> Inductive-hypothetic cycle model (H. Sol)

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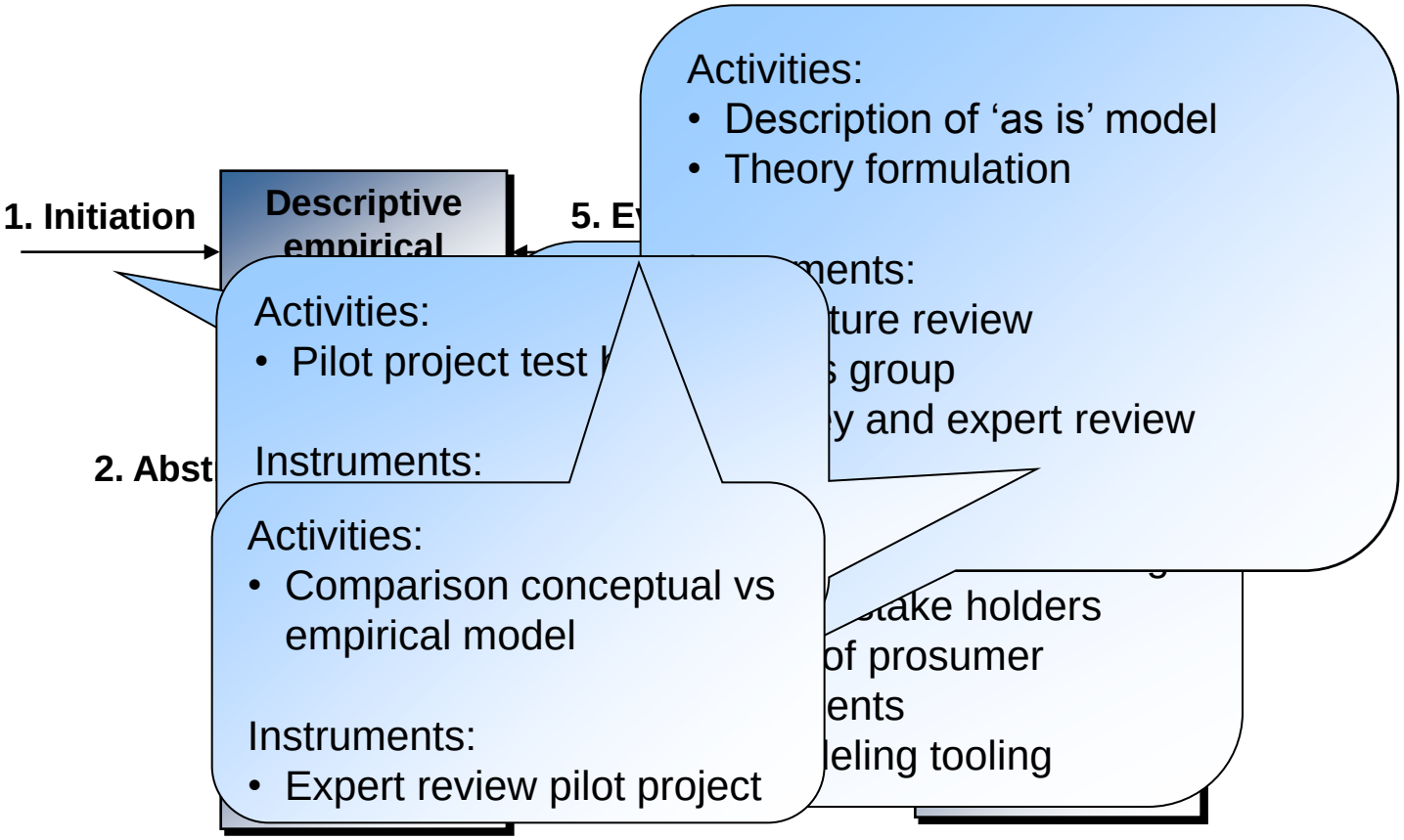
Research approach, strategy & instruments



The inductive-hypothetic cycle model (H. Sol)

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Scientific context:

Menor:

"Offering new services is a competitive issue: enhance profitability, attracts new customers, improves loyalty, new opportunities"

Norman & Ramirez

"Service innovation needs constant mapping onto customer requirements and satisfaction"

Ramaswamy:

"*Total design approach* is needed. Both technical-engineering functions, as well as customer-focused requirements, should be taken into consideration."

Research instruments:

1. *Initiation phase:*
   - *Literature study on service design, interviews with stake holders, case studies of prosumer pilots/experiments*
2. *Abstraction and theory formulation phase:*
   - *Conceptual model: literature review, focus group, survey and expert review*
3. *Implementation phase:*
   - *Flexines project test bed: observations, questionnaires and interviews*
4. *Evaluation phase:*
   - *Flexines project test bed: expert review*