

# CINeLDI

Centre for intelligent electricity distribution  
- to empower the future Smart Grid

CenSES  
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echoes

INVADE

MATCH-PROJECT.EU

## Customers' involvement in flexibility (Or: on working to transform the role of citizens in distributed energy transitions)

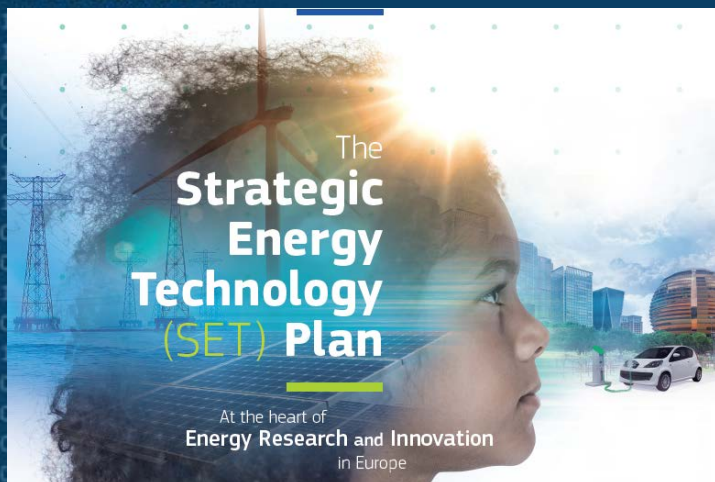
Cineldi Conference, 09.04.2019

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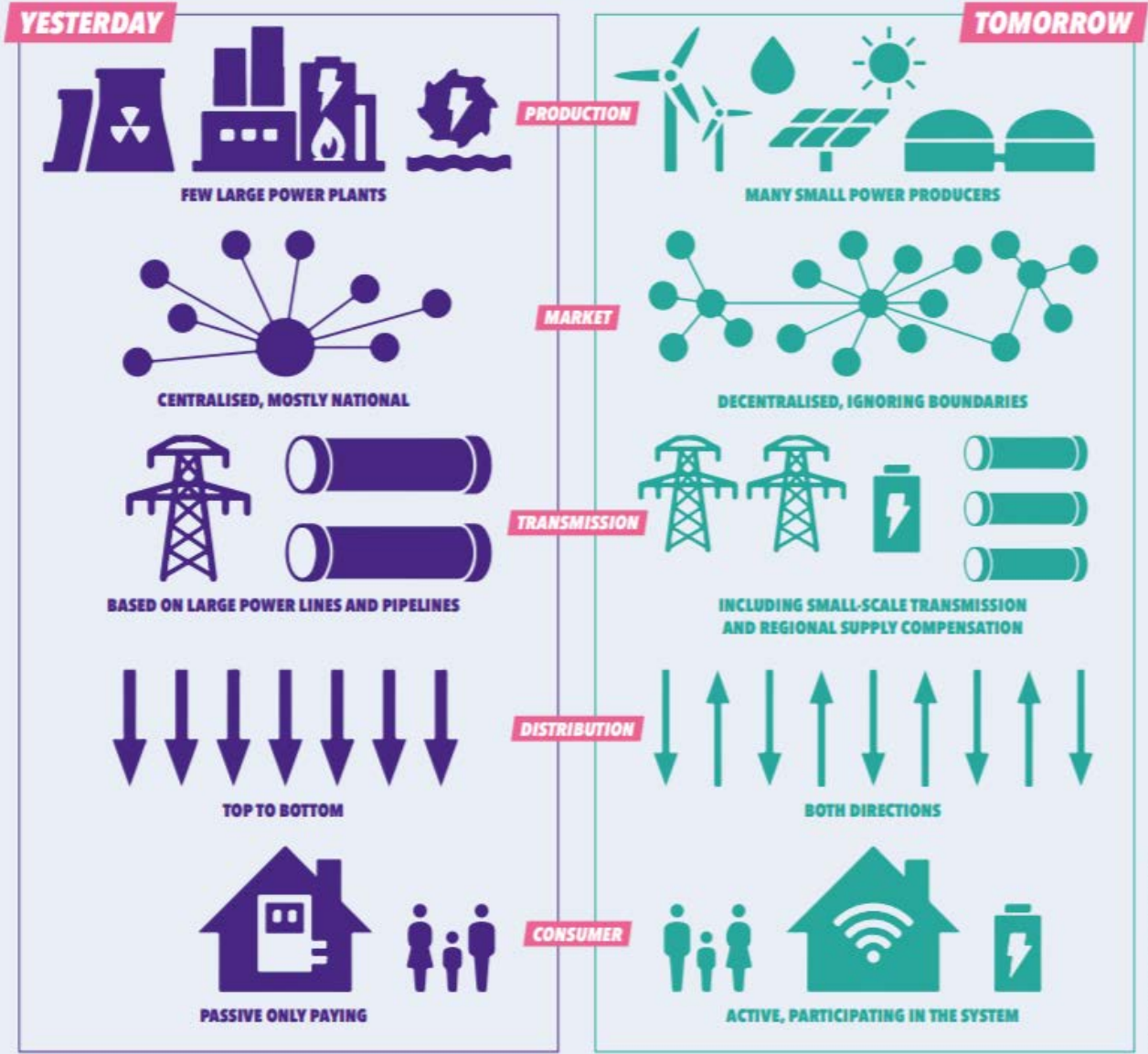
# Backdrop: The emergence of citizens as key actors in enabling European energy transitions

- EU: transition from fossil and nuclear to renewables
- Increasingly important: millions of prosumers (individuals, community projects businesses)
- New wave of electrification (including transport) + digitalization
- «...citizens as the active hearts of European energy systems»



# STAYING BIG OR GETTING SMALLER?

Expected structural changes in the energy system made possible by the increased use of digital tools



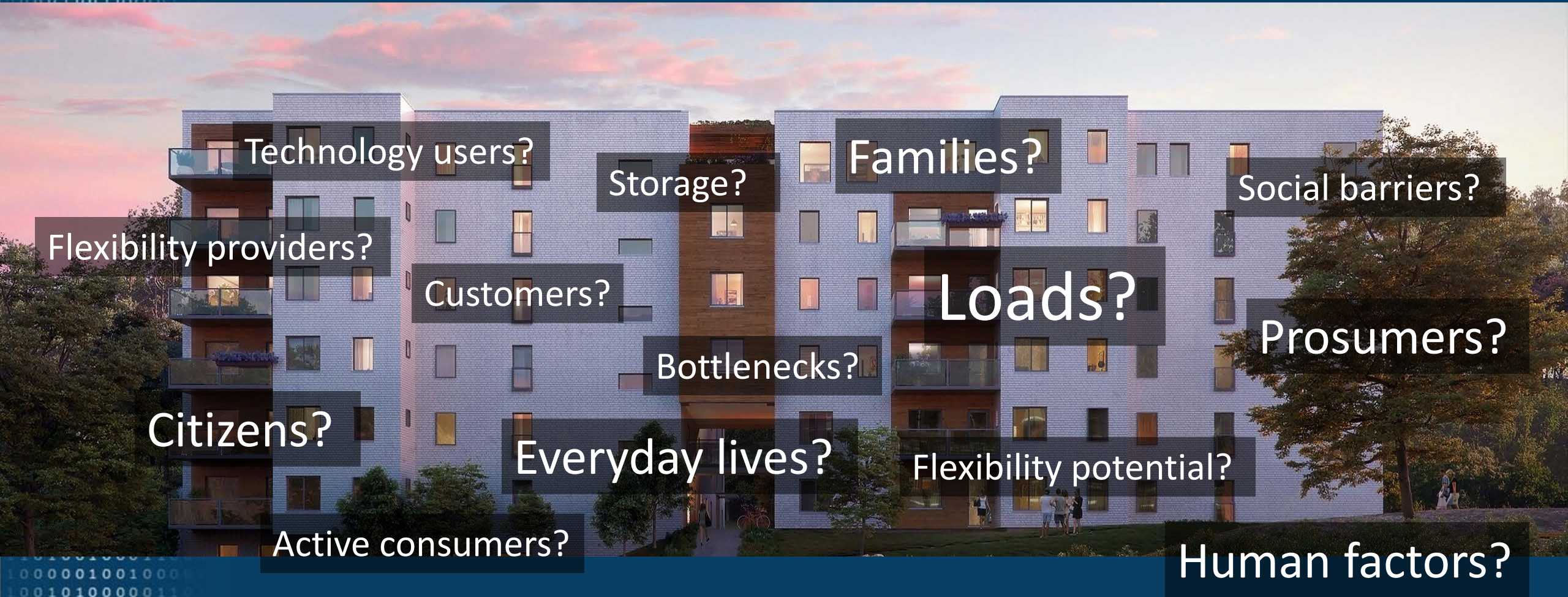
- Making smartgrid solutions involves implementing new technologies
- ...but its just as much about :
  - Re-negotiating roles in energy systems
  - Integrating industries and infrastructures
  - New behaviours
  - New rules and practices
  - New market structures
  - New modes of organization

Flexibility?

In other words: making the smart grid (work) is as much a social as a technical challenge



# What is at the end of the grid? Re-casting the customer



Technology users?

Storage?

Families?

Social barriers?

Flexibility providers?

Customers?

Loads?

Prosumers?

Bottlenecks?

Citizens?

Everyday lives?

Flexibility potential?

Active consumers?

Human factors?



# Beyond customers' involvement in flexibility

- The current social and technological situation:
  - Increasing interest and concern for climate issues
  - Demand for mundane practical strategies in contributing to solving this challenge
  - Great political interest and active public debate about energy technologies
- This is a tremendous opportunity for engaging citizens in broader energy transition issues through smart grid tools and flexibility
- My argument: we are not using this potential, we need to think in new ways about how to stimulate flexibility and citizen participation

# The socio-technical character of flexibility

- Our research into flexibility is twofold:
- 1) Studies of pilot projects, demonstration project, technology designers, production/regulation
  - Actors that work to produce ‘flexibility’ as a concept and commodity in the energy system
- 2) Studies of households, everyday life, energy consumption and potential engagement with flexibility mechanisms
  - A) Focus on households in pilot projects that have new flexibility mechanisms installed
  - B) Broad focus on segments seldom targeted in such projects



Skjølvold, Throndsen, Ryghaug, Fjellså & Koksvik 2018: Orchestrating households as collectives of participation in the distributed energy transition: New empirical and conceptual insights. *Energy res. Social sci.* vol 46 (252-261)  
Skjølvold, Ryghaug & Fjellså 2019: Det fleksible menneske 2.0. *Norsk sosiologisk tidsskrift*

# The production of flexibility as a concept and commodity

- At the core: an interpretation of people as ‘barriers’
- Highlighting a set of envisaged technological solutions
- Also: a framing of flexibility solutions as ‘dugnad’, communal work

PROBLEM	SOLUTION
Lack of knowledge	Information on energy consumption: Information provision, e.g. more detailed bills, feedback, web portals, Information campaigns, energy audits
Economic rationality	New price signals, e.g. Time-of-use power tariff
Poor morals/laziness	Automation

# Do people lack knowledge?

- In general: Relatively good understanding of their own energy consumption
- Genuine desire to understand reasoning behind need for flexibility
- Desire for information rooted in societal issues, not Kwh:
  - How does my flexibility help the local community or the broader grid?
  - What is the relationship between my flexibility and broader energy transitions?
  - What is the relationship between my flexibility and environmental issues/climate change?
  - Who benefits economically from my flexibility?

Skjølsvold, Throndsen, Ryghaug, Fjellså & Koksvik (2018): Orchestrating households as collectives of participation in the distributed energy transition: New empirical and conceptual insights. *Energy res. Social sci.* vol 46 (252-261)

Throndsen, W., & Ryghaug, M. (2015). Material participation and the smart grid: Exploring different modes of articulation. *Energy res. Social sci.* vol, 9 (157-165).

Fjellså et al. (forthcoming)



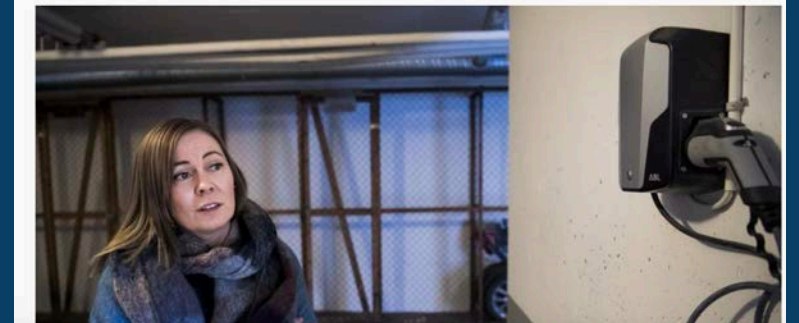
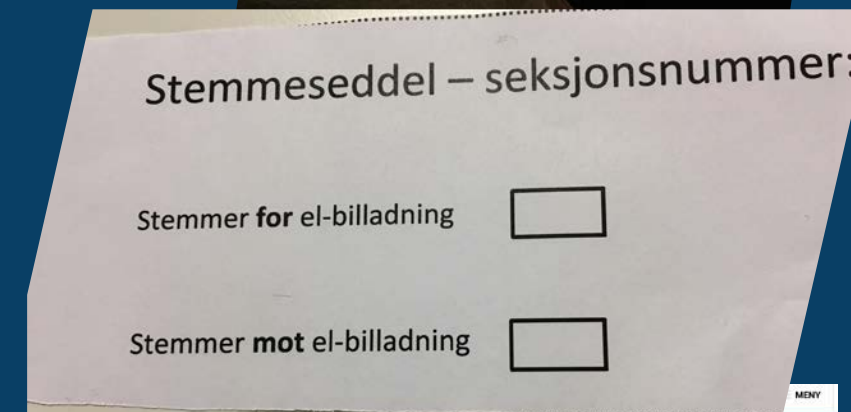
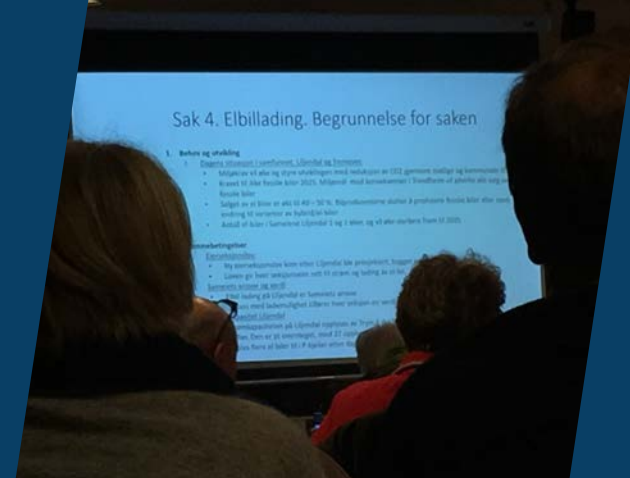


# Will price signals work? For whom? With what consequences?

- Economic motivation varies - households are often more than individuals
- Difficult to compare across cases: economic incentives are set up differently and within very different technological, organizational and practical configurations
- If flexibility contributes to common good: strong emphasis on principles of equity and fairness
- Very strong economic incentives will likely work, but will also have very unequal effects of rewards and burdens

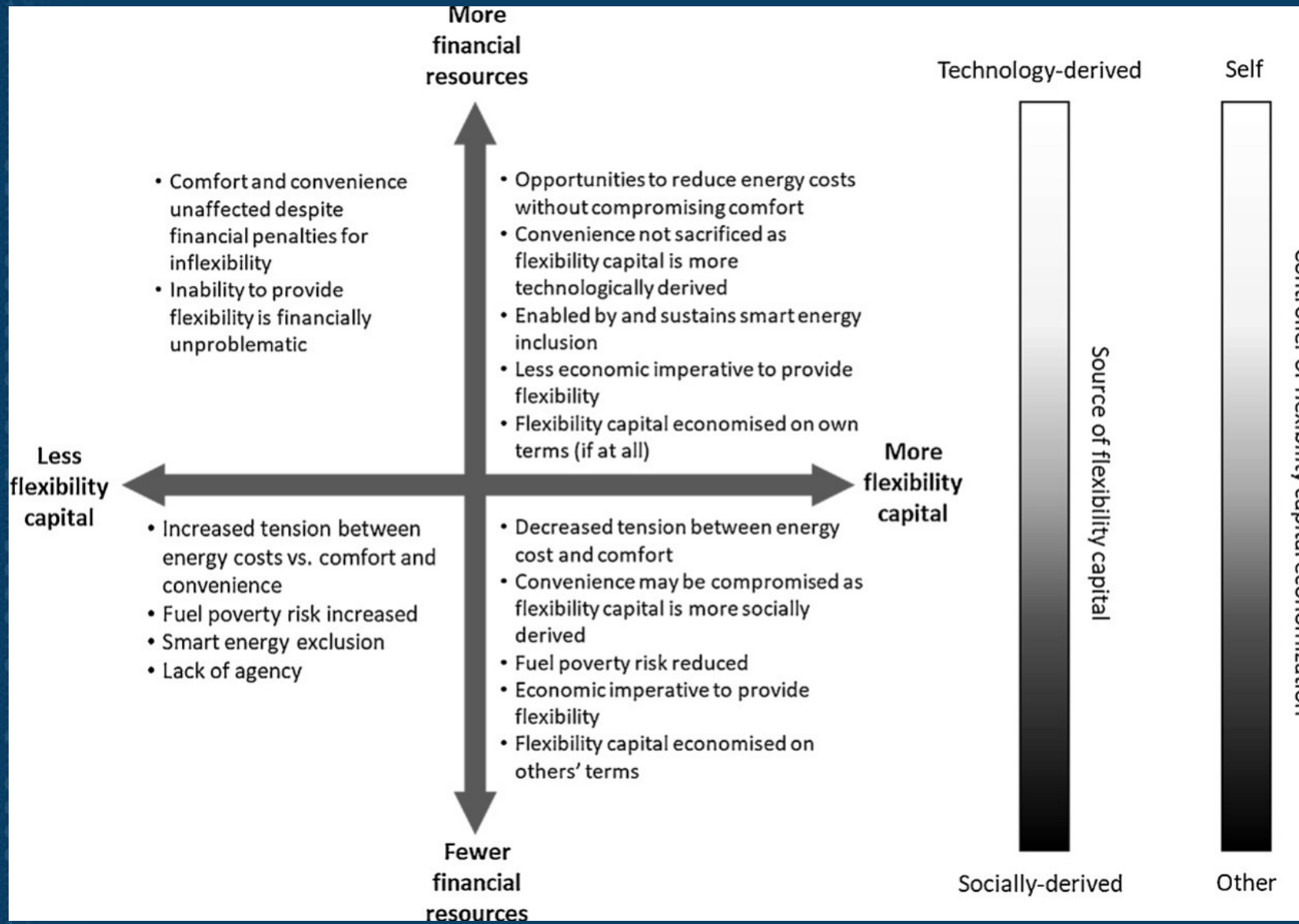
# What about automation/Remote control?

- Many are conditionally positive
- Concerns:
  - Maintenance
  - Being controlled vs having control
  - Trust (in system and companies)
  - Who will own the equipment, on which conditions?
  - Surveillance/data security etc. is only a small part of this discussion
- When infrastructure is shared (e.g. smart charging in 'borettslag' garages): How to implement in a fair way?



# The politics of customer flexibility

- When we implement 'flexibility mechanisms', we also shape future society: roles, future ways of living, future markets etc.
- Often in unexpected ways: flexibility = outcome of complex processes amongst technology developers, policymakers, regulators AND citizens
- Hence, smart grid development and implementation is highly political work (...so engineering is actually MORE important than you already think!)



Powells, G. & M.J Fell (2019): Flexibility capital and flexibility justice in smart energy systems. *Energy res. Social Sci.* vol 54 (56-59)

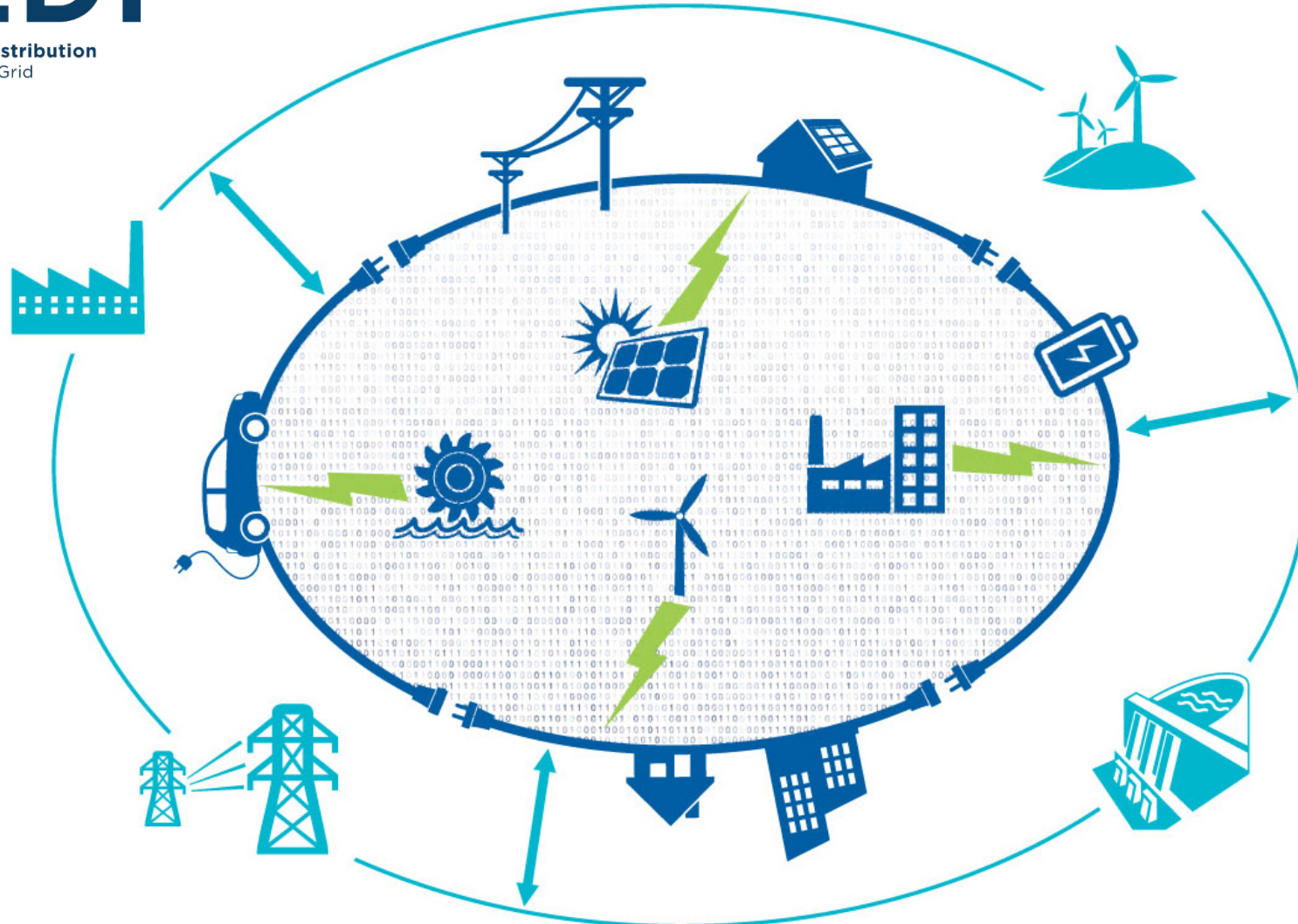


# Challenges and opportunities

- Engaging collectives, not individuals
- Appealing to rationalities beyond economic and technical interest
- Mobilizing political potential: engaging in discussions about societal consequences (local, national and global)
- Contextualizing the need for flexibility
- Working actively to anticipate and prevent negative effects

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