

# Innovation in coordination of electricity supply

Liberalization, local energy communities and beyond

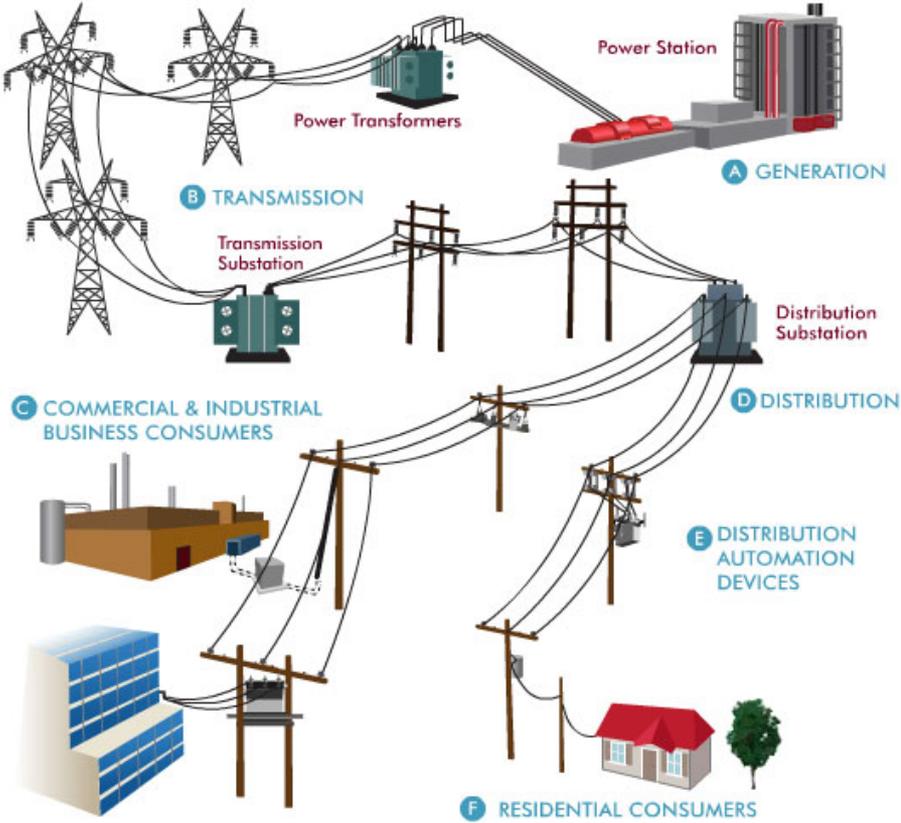


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Salzburg 19th REFORM Meeting September 2014



# The starting point: The central station electricity system



# Past

## Monopoly regulation



Natural monopoly regulation

Centralized planning, management and control of capacity, tariffs

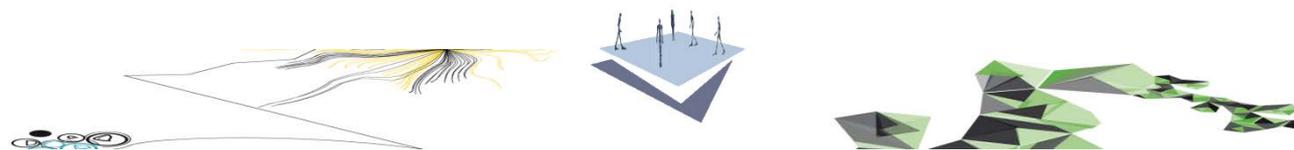
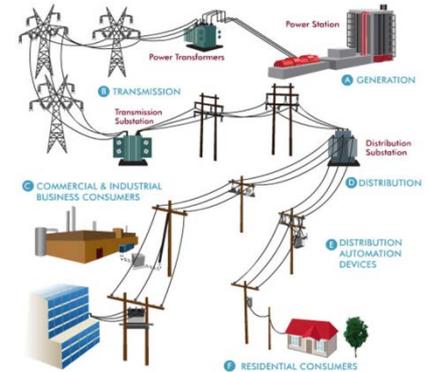
Integrated companies

Production/transmission/distribution/supply

Centralized technical and financial management of the system

Technical and financial dispatch

Publicly owned and controlled companies



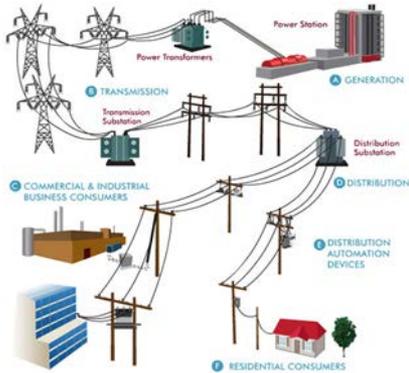
# Present: market based electricity/gas supply

Market regulation

Market regulation



Monopoly regulation



- Free choice of supplier
- No entry restrictions production and supply
- No tariff restriction in production and supply
- Unbundling of commercial and transportation functions
- Third part access to the grid
- Government at distance: **market regulator**

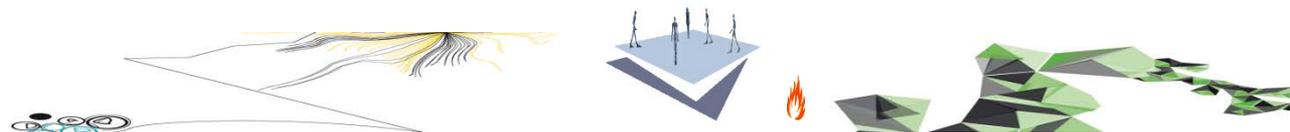
# Basic Coordinating Systems (A&K, 1996)

Coordinating mechanism	Unit of decision making	Mechanism of allocation	Dominant economic goal
Market	Individual	Price setting	Individual profitability and continuity
Network	Group	Agreement	Collective profitability and continuity
Hierarchy	Public authority	Directive	National public interest



# Pure and mixed coordination systems (A&K, 1996)

Added allocation mechanism	Dominant allocating mechanism		
	Price	Agreement	Public authority
Price	Full free market	Coordinated liberalization	Controlled liberalization
Agreement	Free coordinated market	Full coordination	Controlled coordination
Public authority	Free controlled market	Coordinated control	Full hierarchy



# Failure of coordination?

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- **Hierarchy:**

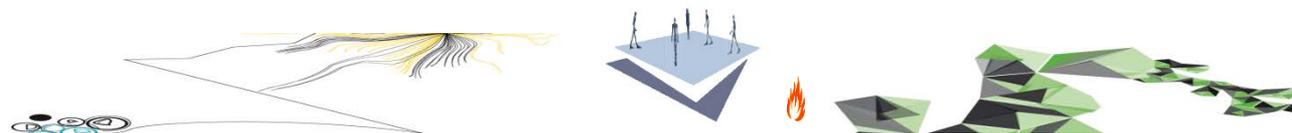
- Nuclear energy: Technology out of control

- **Market:**

- Financial crisis
- Concentration
- Marginal sustainable innovation (periphery) (Netherlands)

- **(Agency) network:**

- Permissiveness
- Ineffective



# An emerging alternative: local energy community

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- In a way revival of grass-root movement
  - Combination of moralism, autonomy and self-organisation
    - Past: anarchism, leftism, ecologists, anti-nuclear
    - Present: Small scale energy systems
- Autonomysation of problem perception and solution
- Morally guided design of own environment
- Neglectance incumbent technology and institutions:
  - **Localised technology**
  - **Self organisation**



# Basic Coordinating Systems

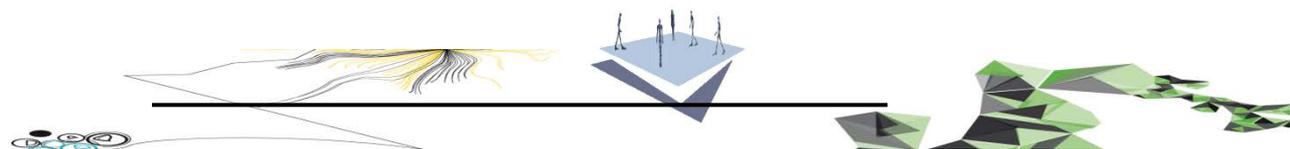
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Coordinating mechanism	Unit of decision making	Mechanism of allocation	Dominant economic goal
Market	Individual	Price setting	Individual profitability and continuity
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Hierarchy	Public authority	Directive	National public interest
Authonomy	Community	Values (Community spirit)	Community well being/ local harmony

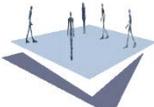
## Rule based institutional setting (Elinor Ostrom)

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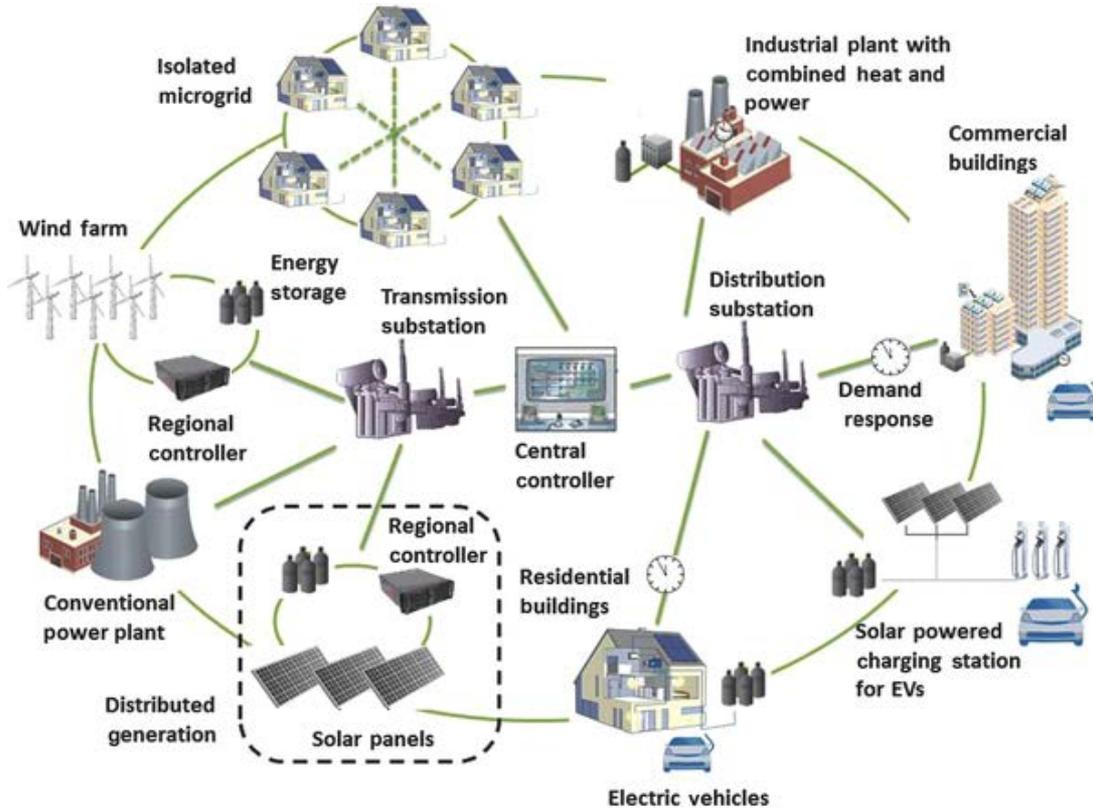
- Position rules (who takes part)
- Boundary rules (entry and exit rules)
- Scope rules (what type of outcome is at stake)
- Authority rules ( Who does what)
- Aggregation rules (how to make decisions)
- Information rules (how to communicate)
- Pay-off rules (division of costs and benefits)



# Action arena's and their defining rules

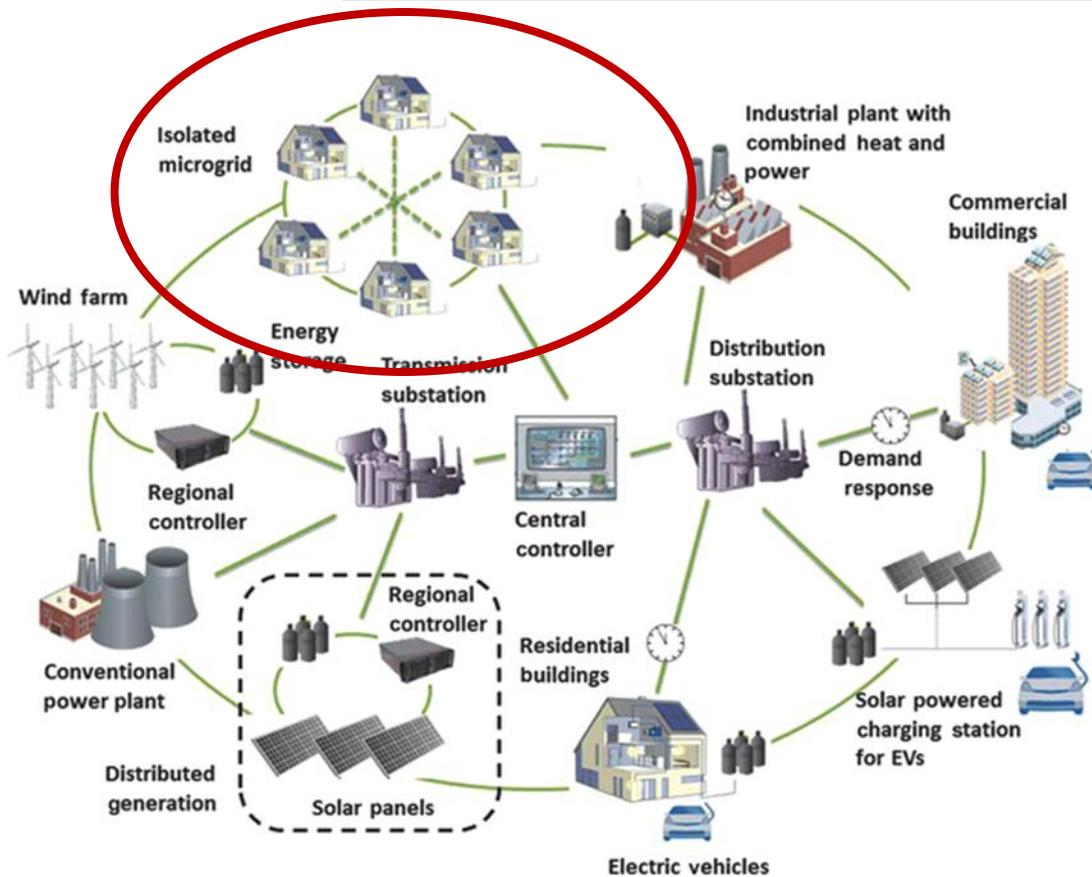
	<i>Markets(Structures inducing competition)</i>	<i>Networks (Structures inducing co-operation)</i>	<i>Hierarchy (Structures inducing authorization)</i>	<i>Autonomy (Structures inducing self organisation)</i>
Position rules	Property rights	Membership	Addressee	<b>Residence</b>
Boundary rules	Contracts	Voluntarism	Legalism	<b>Membership</b>
Scope rules	Private interest	Common interest	Public interest	<b>Morality (Doing good for neighborhood)</b>
Authority rules	Exchange	Communication	Submission	<b>Devotion</b>
Aggregation rules	Prices	Agreement	Directive	<b>Community commitment</b>
Information rules	Demand and supply	Cooperation	Legal restriction	<b>New social media, community communication</b>
Pay-off rules	Efficiency 	Legitimacy 	Effectiveness	<b>Local harmony</b> 

## The central station electricity system



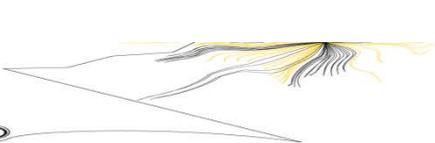
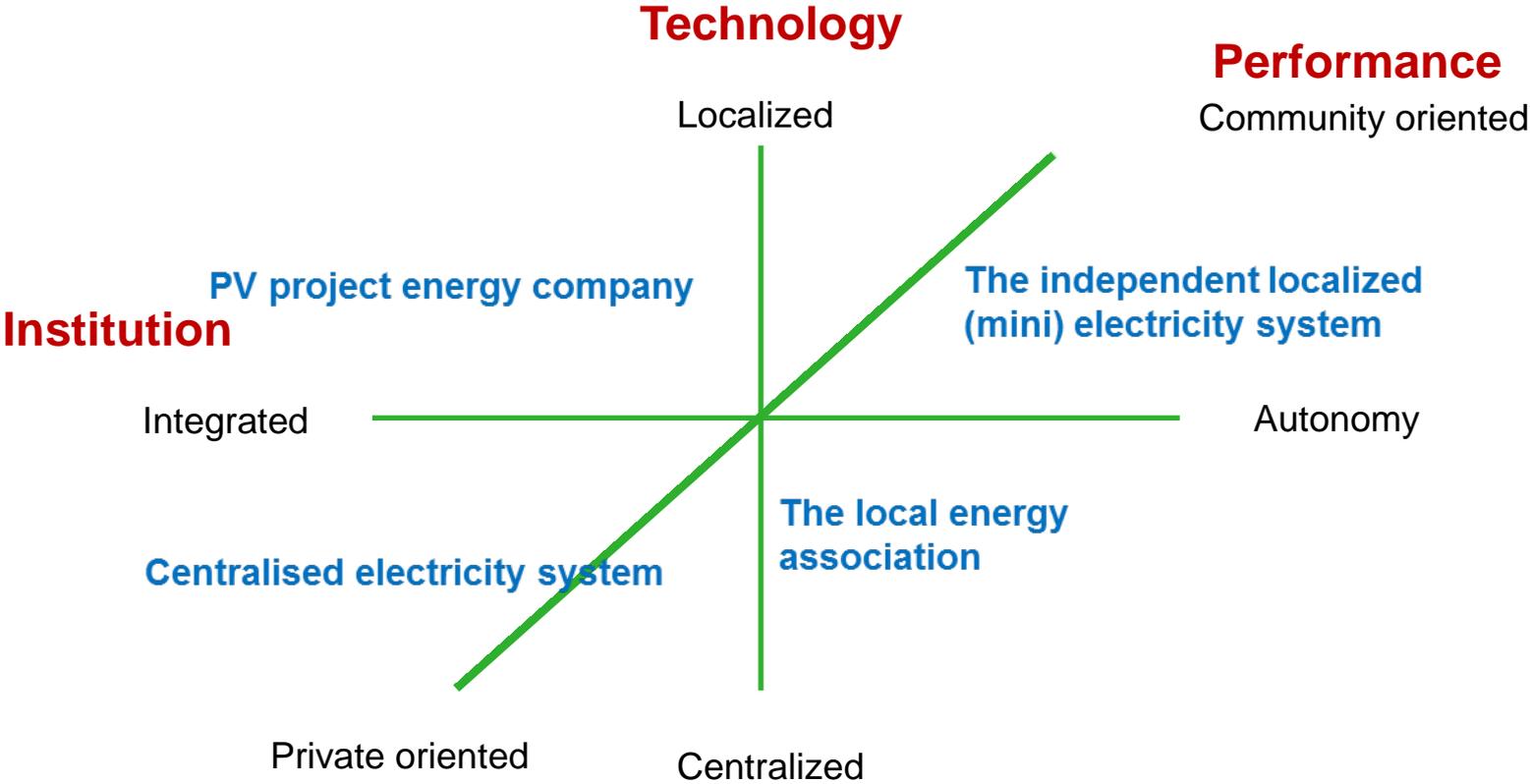
- Institutionally: Integrated
- Technology: Centralised
- Performance: Private

# Localised mini grid

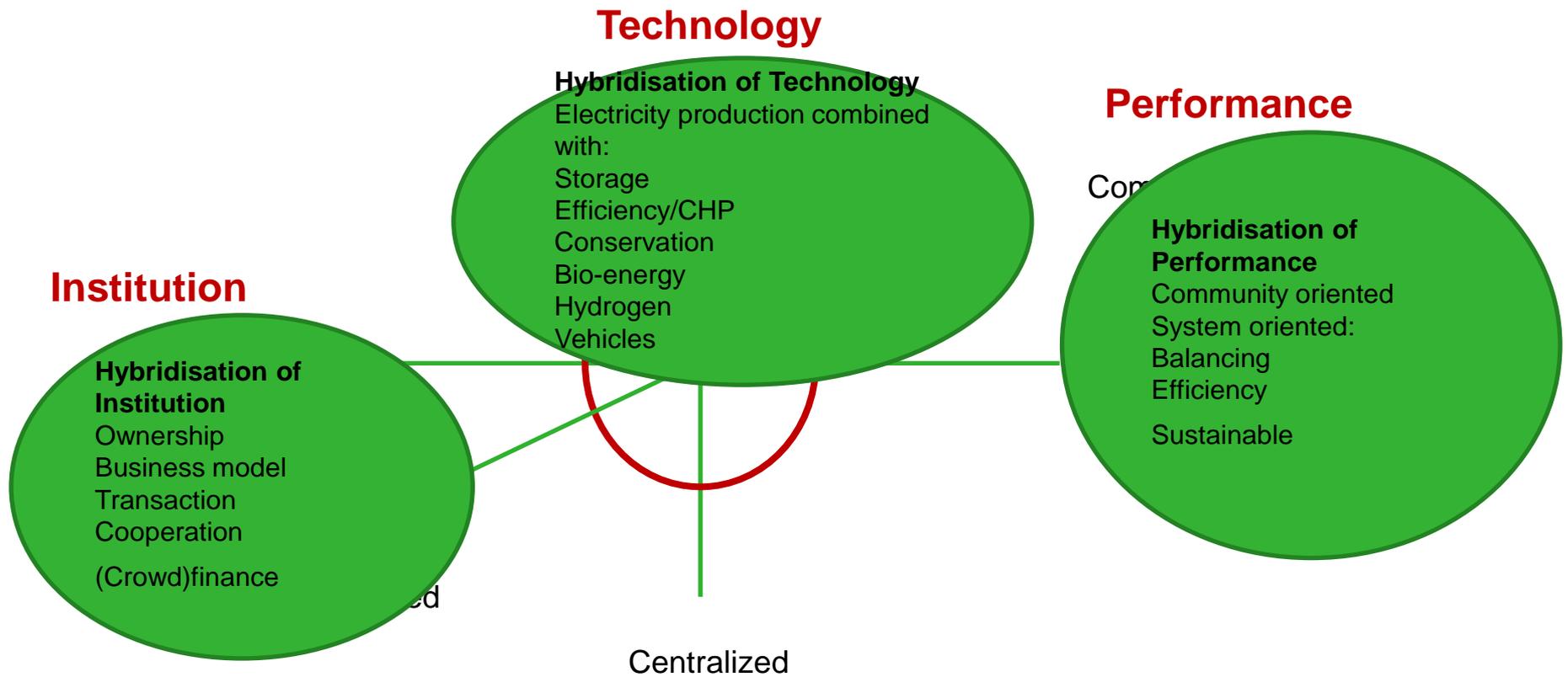


- Institutionally: Autonomous
- Technology: Localized
- Performance: Community

# A three dimensional classification space



# Implication: Hybridisation



# Implication for local energy communities

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- Professionalize
- Creates trust
- Enables transactions with incumbents
  
- Other reason:
  - The reliability and complexity of the system which should not be at risk by amateurs



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Thanks for your attention

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