

# **Effective market integration of decentralized flexibility in the electricity system**

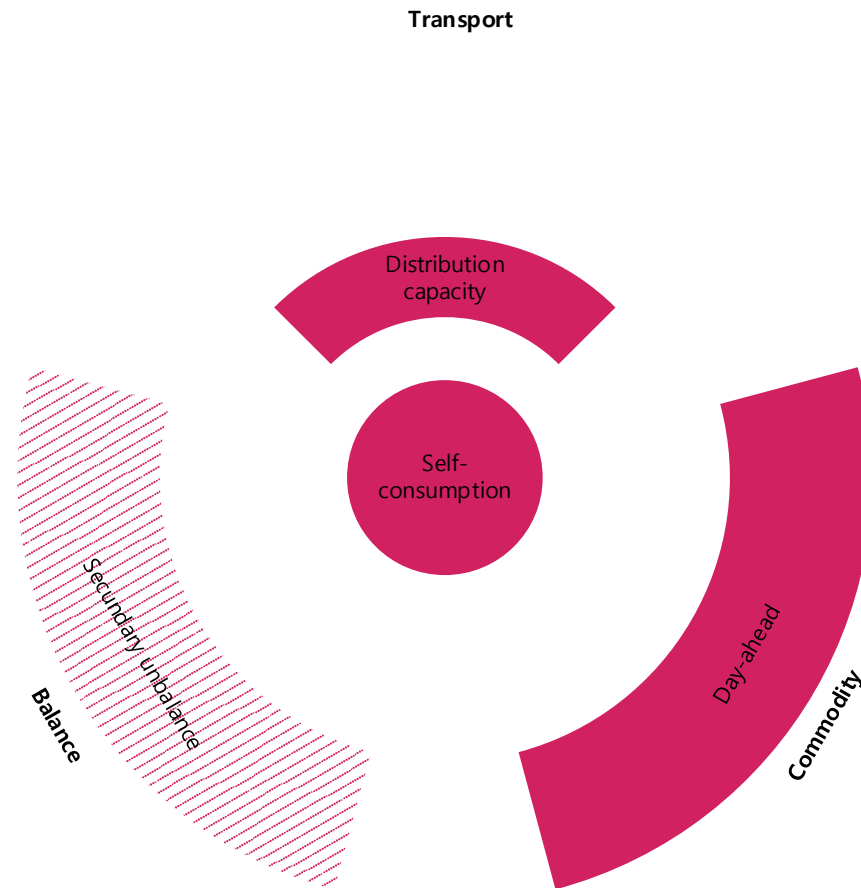
Energydays 28-03-2019

# From commodity to differentiated value

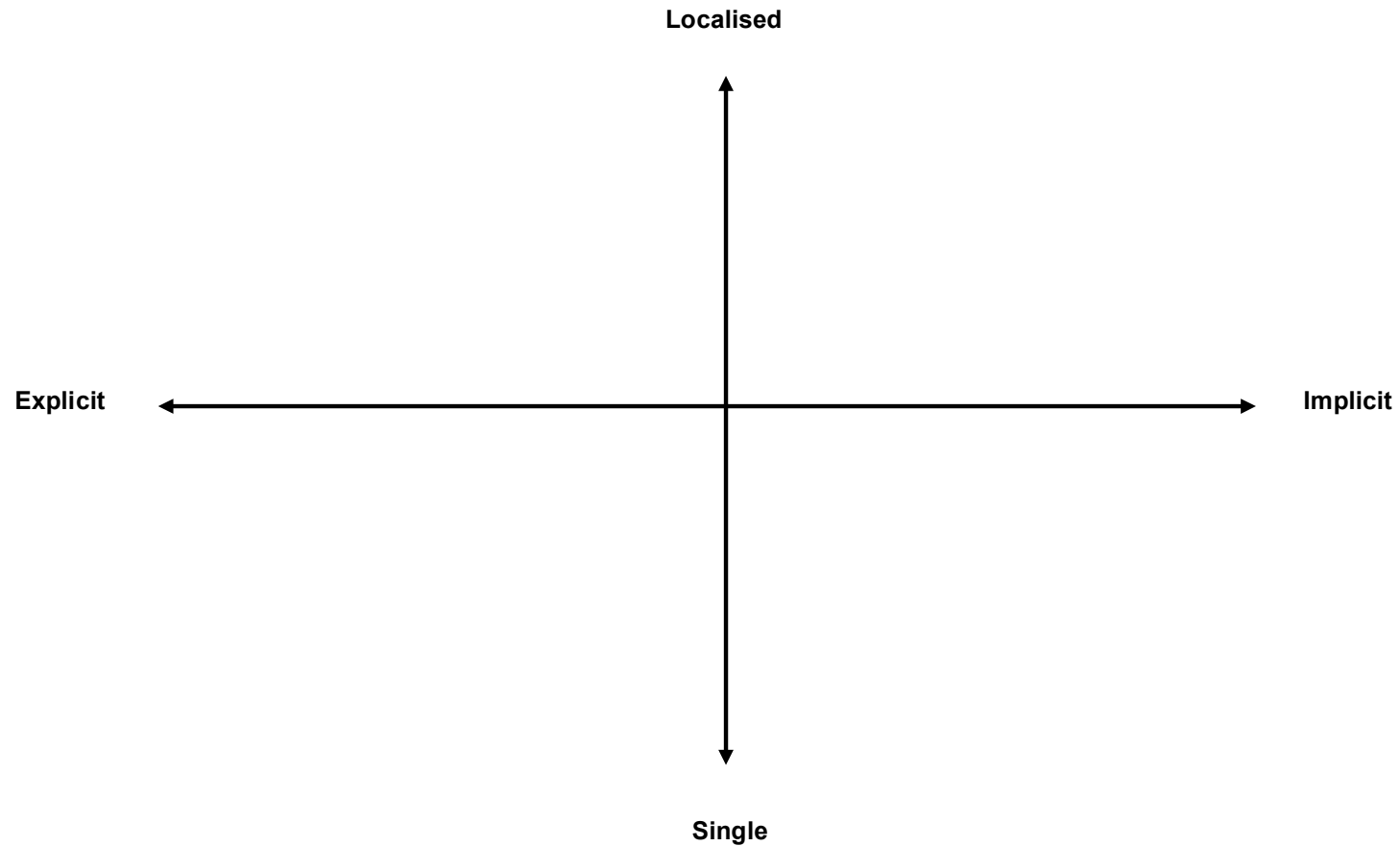


- Temporal value differentiation
- Locational value differentiation
- Diverse supply and demand curves from actors and technologies
- Socialized cost of infrastructure more complex

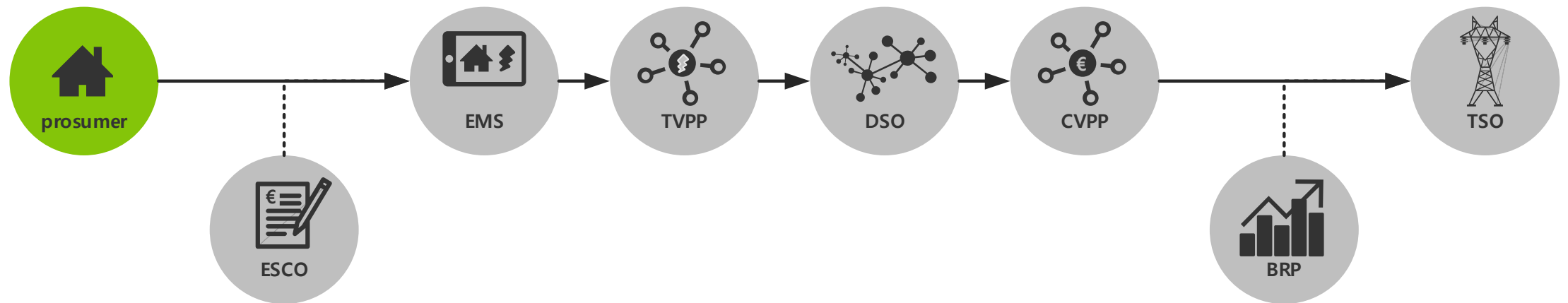
# Cost-reflective markets



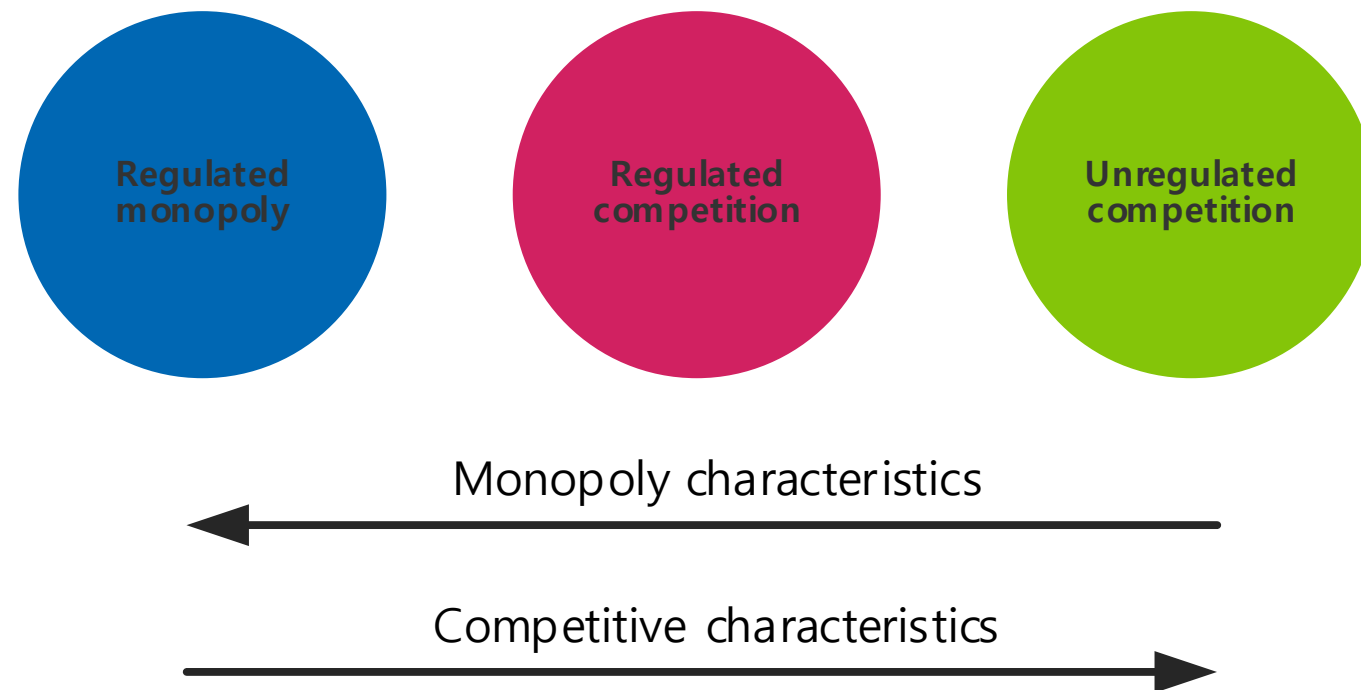
# Inclusivity determines market models





# Platform functions



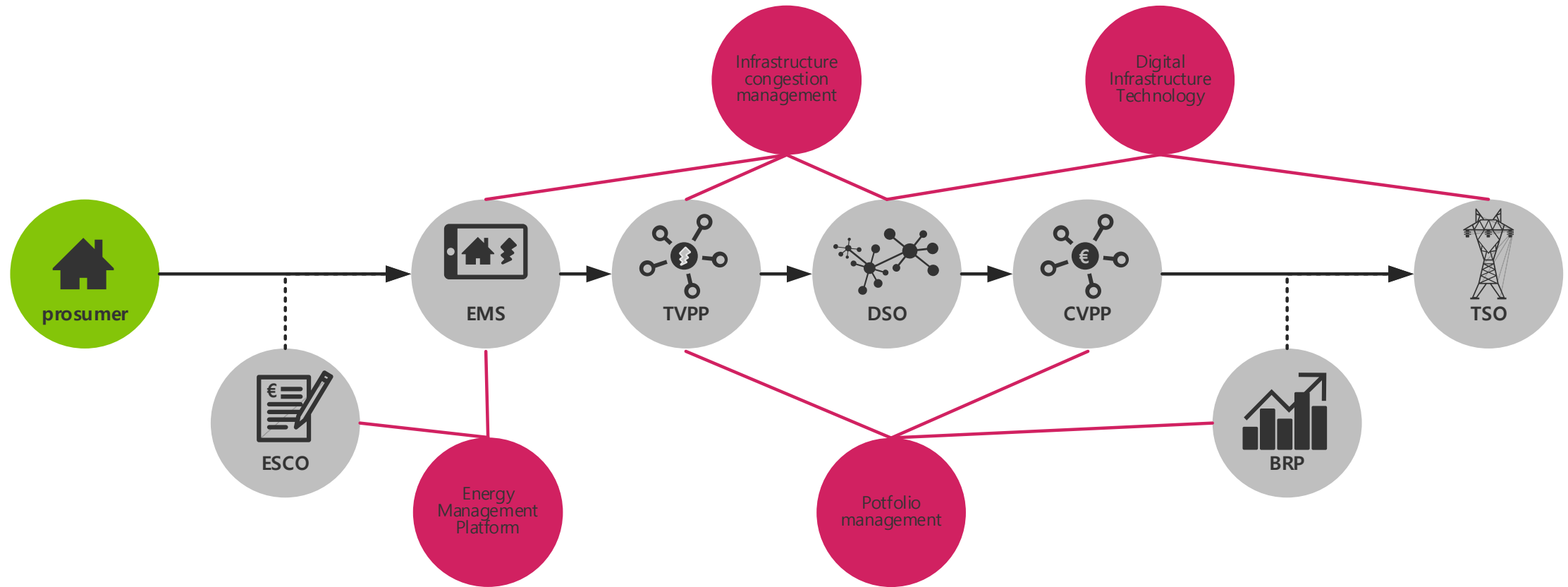
# Perfect competition in fair markets



# Micro-economic characterization

	 TVPP	 CVPP
Externalities		
Network effects		
Economies of scale		
Opportunity for innovation		
Homogeneity of products		
Market development		
Risk management		
Perfect information		

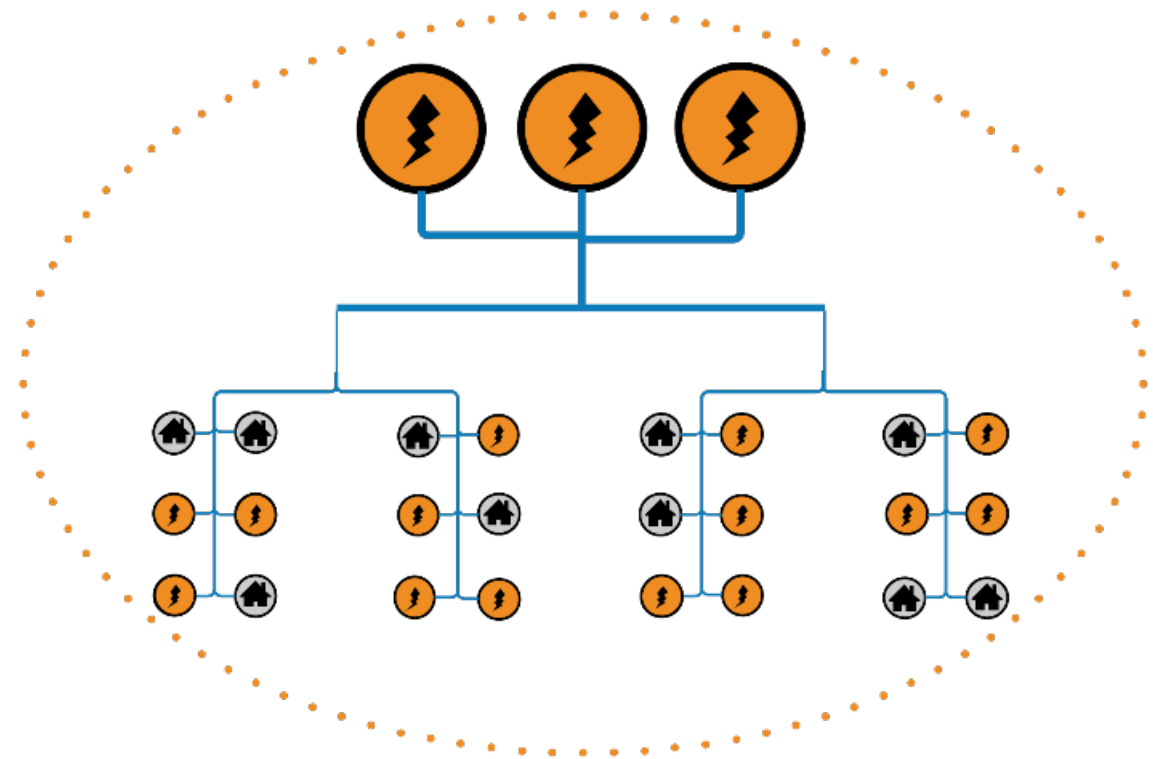
# Economies of scope





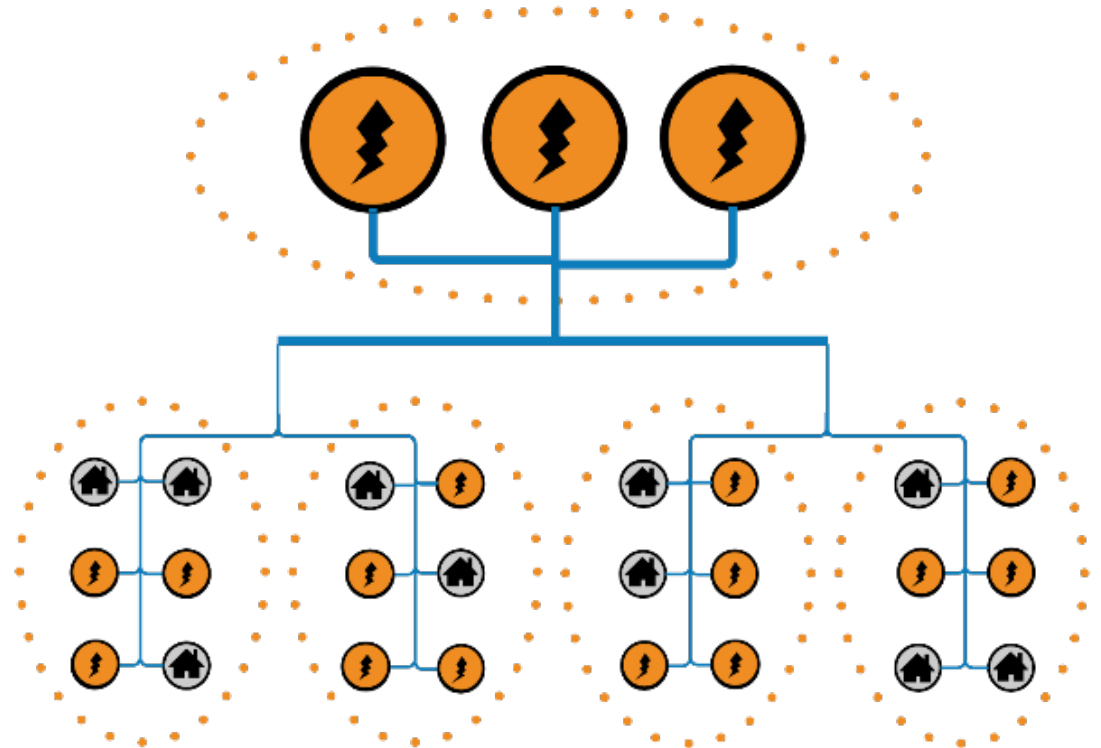
# Flexibility aggregator (single - explicit)

- Centralized renewables
- Capacity market mechanisms
- Supra-national suppliers
- Portfolio dispatch management
- Flexibility aggregator



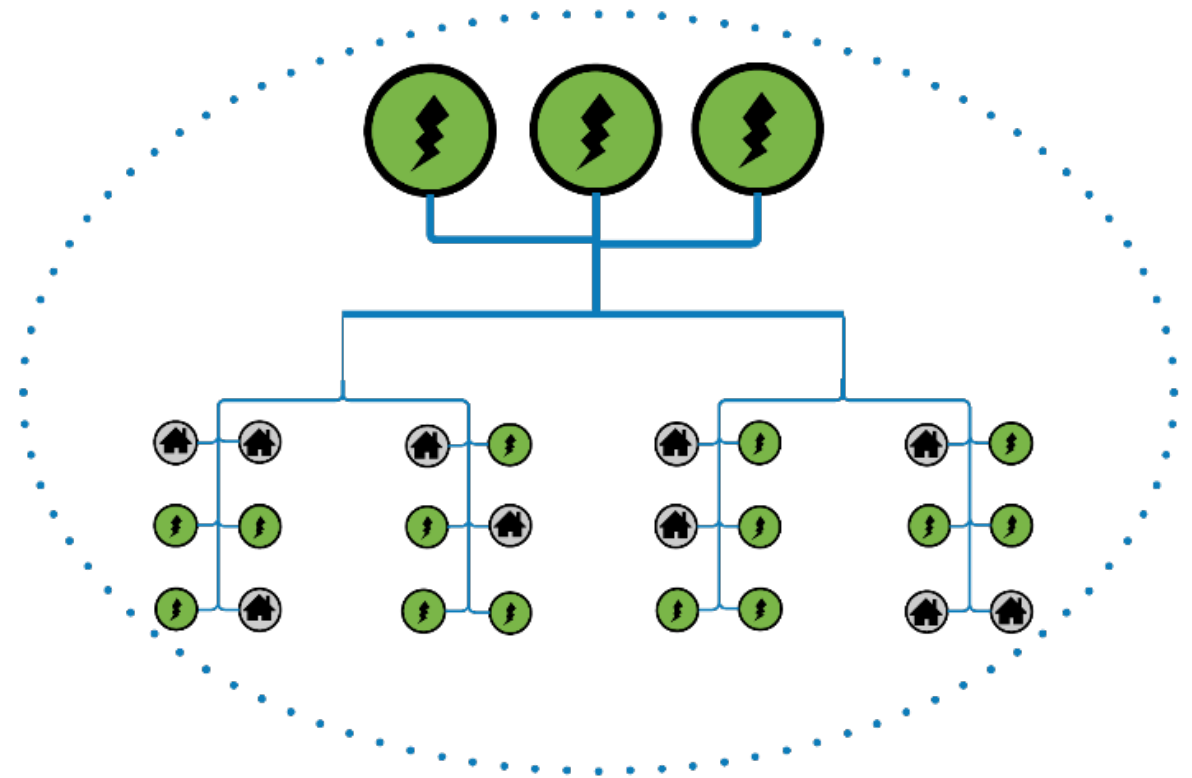
# Energy as a service (locational - explicit)

- Energy vector integration
- Unbundling
- Energy management platform
- Sustainable area developer



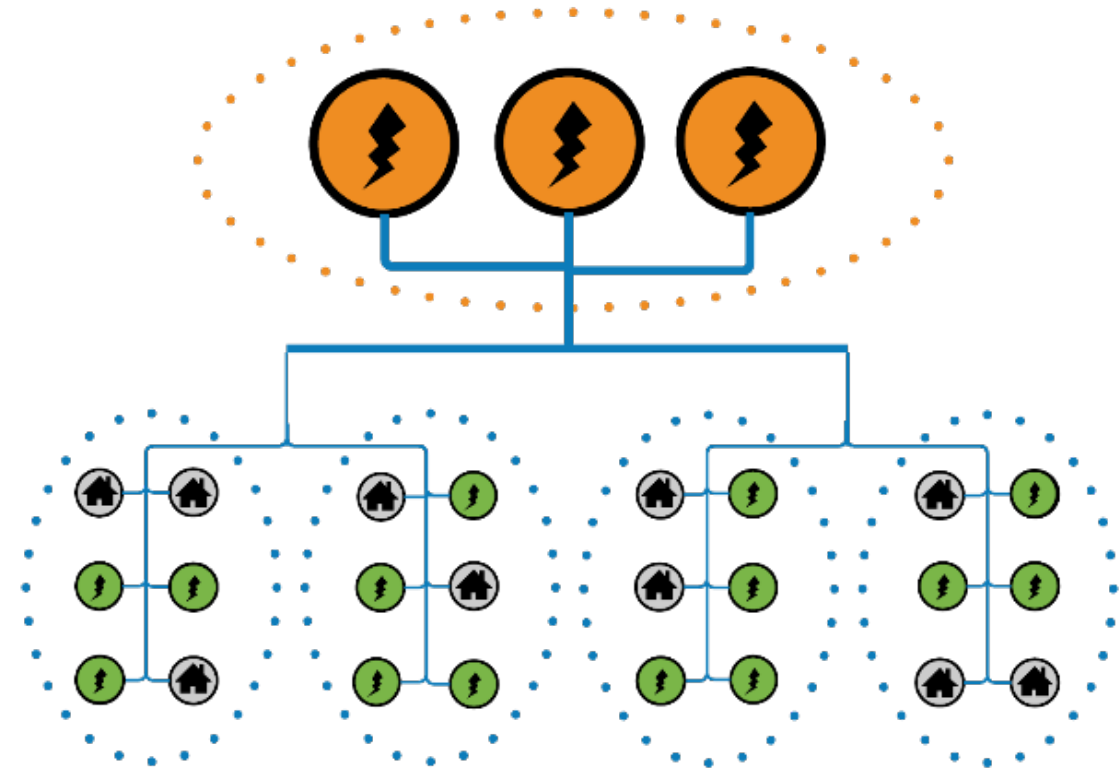
# Internet of energy (single - implicit)

- Load defection
- Infrastructure reinforcement
- Retail subsidies
- Digital infrastructure
- System market platform



# Collective power (locational – implicit)

- Electrification
- Supra-national market
- Load opportunism
- Congestion management
- Local utility



# Conclusion

- The electricity system and market models are changing over time
- The electricity system and market models are changing different per location
- Market models are path dependent
- Market models are both an optimization problem as well as a societal choice