An "Airbnb for Electricity": Institutional Theory for a Platform Model in an Historically Regulated Industry

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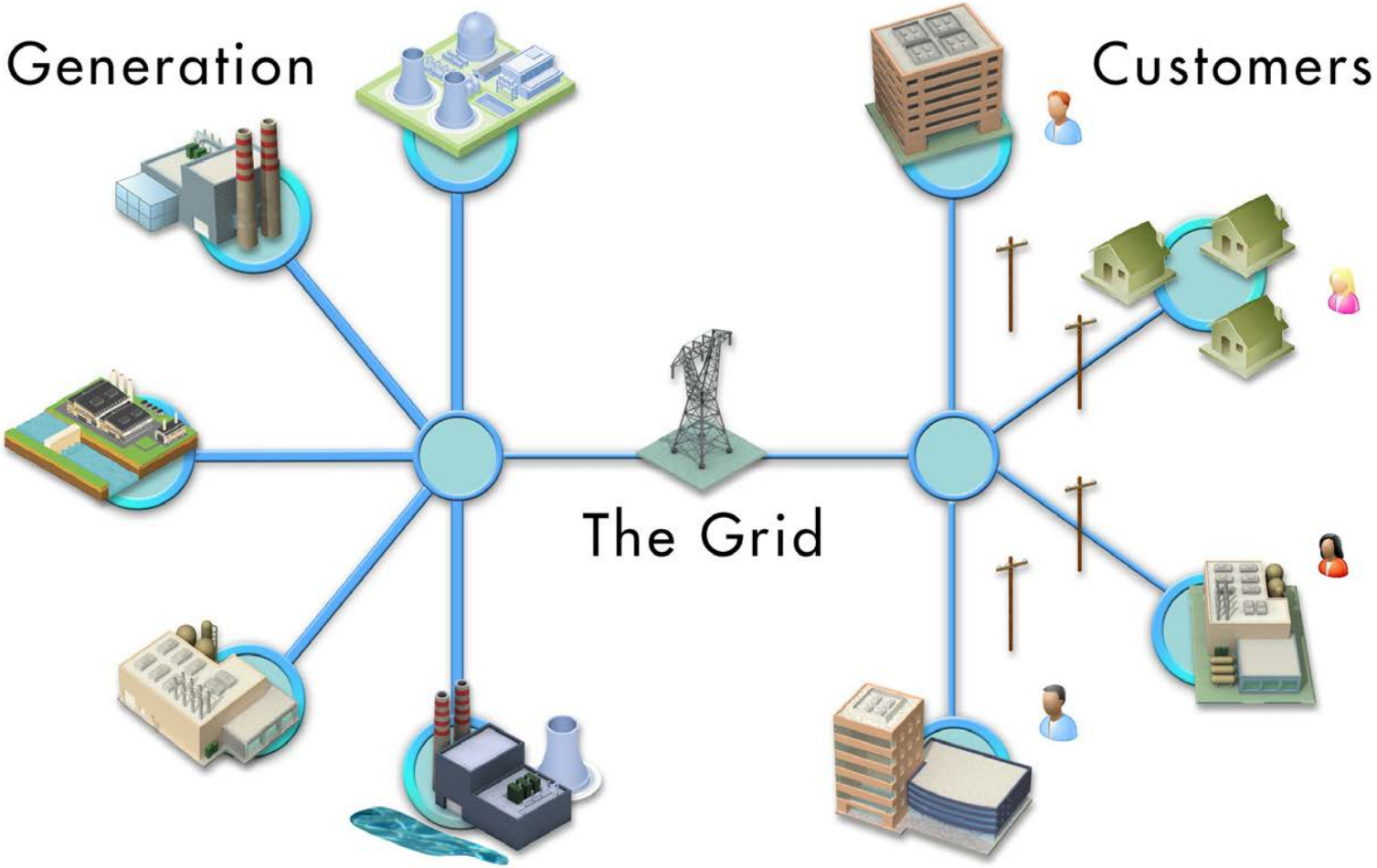
Airbnb as a multifaceted platform

Source: fontsinuse.com

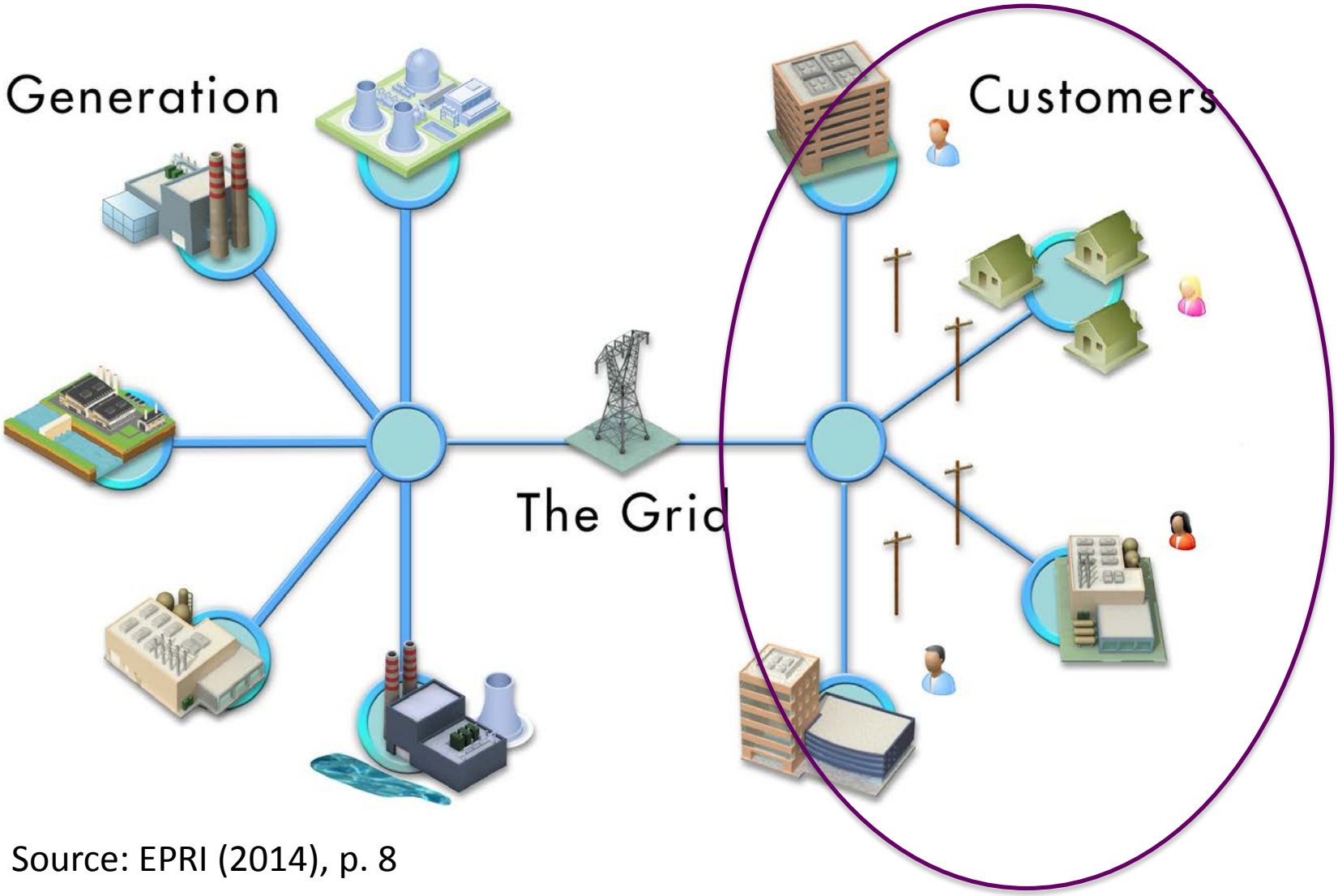
- Market – connecting buyers and sellers
- Governance – rules creating community
- Enables innovation/adaptation by users around the platform edge

Today's power system



Source: EPRI (2014), p. 8

Distribution grid/network



Source: EPRI (2014), p. 8

Electricity as a regulated monopoly industry

- Regulatory compact: bargain between regulators and regulated
  - State-level regulation establishes a legal entry barrier (market & wires)
  - Monopolist earns opportunity cost of capital in return for its obligation to serve
- Rate of return regulation based on cost recovery
- 20th century objectives: safe, reliable, affordable, uniform universal service
  - Even in this architecture, electricity need not be just a commodity
- 20th century model: build build build, regulators approve investments, expenditures, rates

Transaction cost reducing innovation at the distribution edge

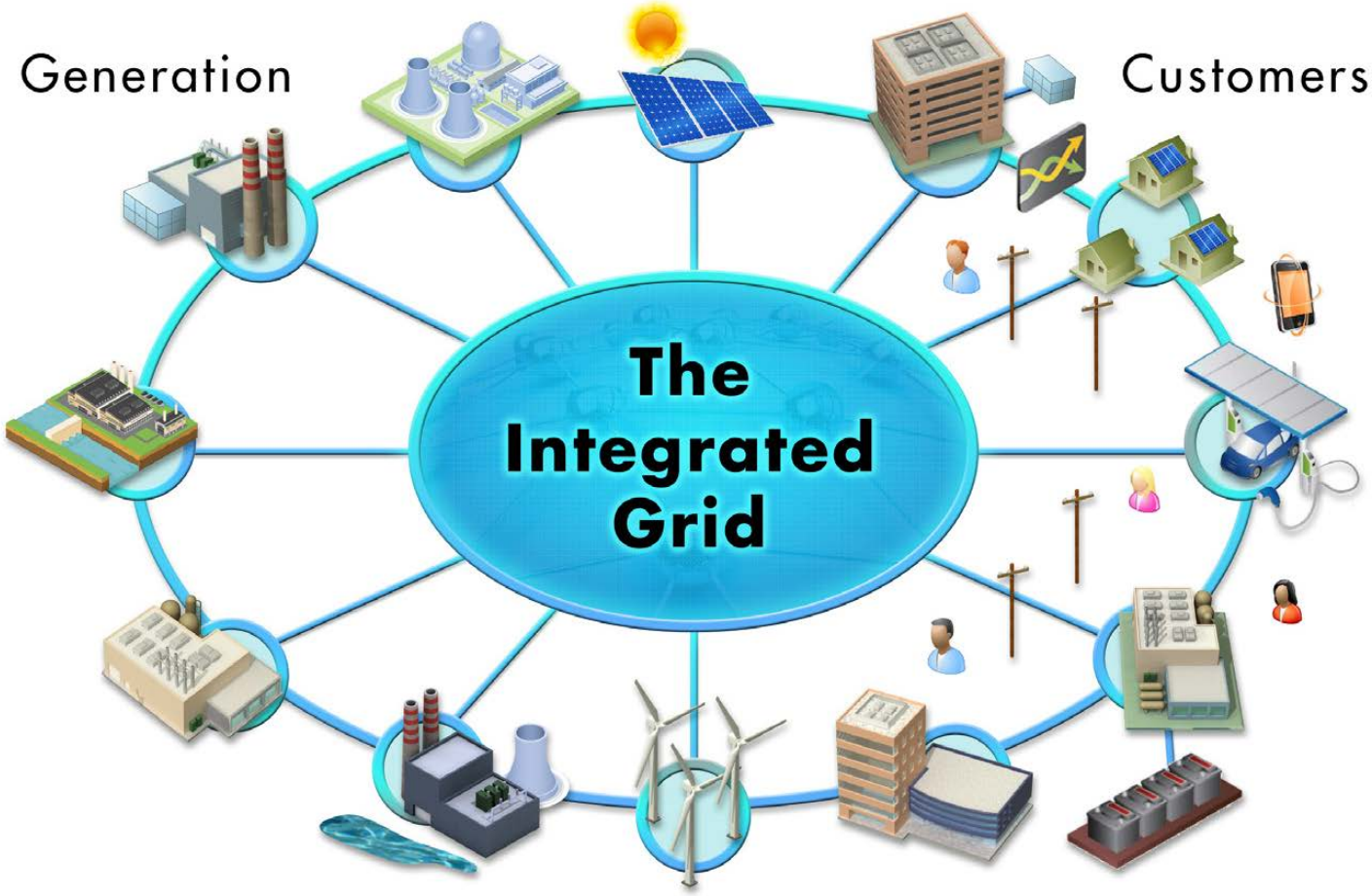
Entrenchment

- Status-quo preference and resistance to innovation by regulators and regulated
  - Physical infrastructure and regulatory institutions designed for centralized control in a vertically-integrated firm
- Entrenched industry with innovation and changing priorities around its edges
  - Digital transaction cost-reducing innovations
  - Distributed energy resources (DERs)
  - Consumer desire for decentralized control and ability to automate
  - 21st century policy objectives: safe, reliable, affordable, cleaner, customizable

Thought experiment

Source: Wikimedia Commons

Regulated wires company as a platform: wires and market



Source: EPRI (2014), p. 31

Platform literature

- Gawer's (2014) three platform concepts
  - Technology
  - Economic
  - Organizational-institutional-governance
- Technology and economic concepts are primarily static; governance/organization introduces a dynamic aspect
- All three are important in an evolution to a distribution platform in electricity

Transaction cost economics

- Williamson: model the firm as a governance framework that economizes on transaction costs
- 20th century regulated utility: integrated mechanical technologies, economies of scale and scope, high transaction costs mean vertical integration – "natural monopoly"
- Innovation that reduces transaction costs changes the transactional boundary of the firm – VI not necessary because transaction costs have fallen
- VI creates potential for incumbent vertical market power in retail markets (Kiesling 2014)

Entrepreneurial theory: Experimentation

- Is part of the process of value creation through creative destruction
  - Product differentiation, bundling, change market boundaries, rivalry among differentiated bundles
  - New entrants are most likely to risk their resources doing so
  - Schumpeterian disruptive entrepreneur
- Is essential to entrepreneurial discovery of new knowledge, leading to value creation when innovation does not rely on regulatory permission
  - Kirznerian equilibrating entrepreneur (with a dash of Hayek)
- Epistemic context: the knowledge relevant to coordination across individuals and across economic and environmental objectives is dispersed, private, often tacit, so regulatory mandates cannot replicate it

Why a distribution (market & wires) platform?

- Technology platform: interoperability and interconnection
- Economic platform: markets facilitate exchange among heterogeneous agents, taking advantage of transaction cost-reducing innovations
- Governance platform: consistent rules for self-regulation that accommodate heterogeneity, enable adaptation, create community where relevant
- All three serve the objective of enabling innovation and new technology adoption