

# Can vertical disintegration, deregulation, and innovation be a win-win-win for electricity markets?

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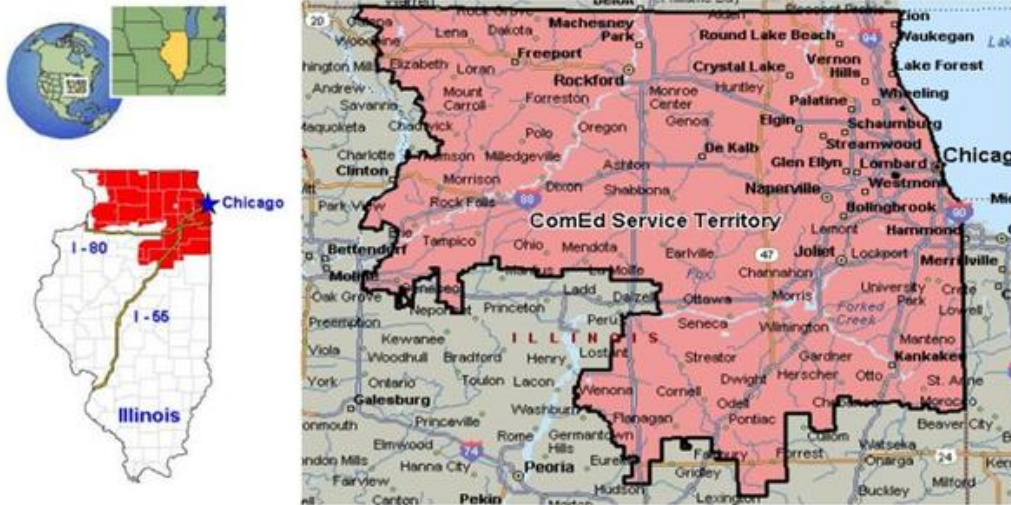
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Beesley Lecture November 2014



NORTHWESTERN  
UNIVERSITY

### The ComEd Service Territory in Northern Illinois



- Investor-owned utility
- Incumbent distribution utility
- Restructured state with “full retail competition” since 2006
- Default service provider
- By 2012, miniscule residential entry and <1% customer switching
- Remains the dominant firm in the residential retail market, by a long shot

*Incumbent vertical market power in a “competitive” retail market*

# Questions I'll pose tonight

- What role does incumbent vertical market power play in reducing innovation and dynamism?
- To what extent is incumbent vertical market power a result of regulatory design?
- How does regulatory design affect the emergence of new innovations, services, and markets, such as the residential solar market in the US?
- Is there a more useful theory of competition in which we can ground regulatory practice?
- What does an experimentation-based theory of competition imply for innovation and for regulatory institutional design?

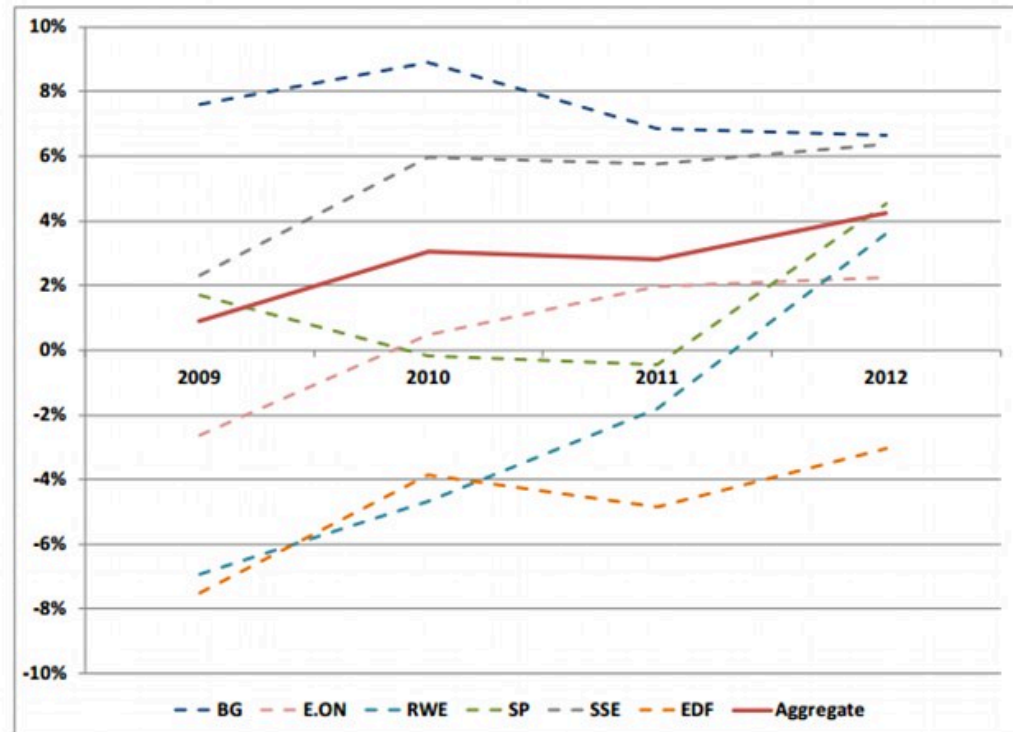
Punch line:

Retail competition

+

Technology-agnostic, performance-  
based environmental policy

Figure 2: Domestic supply profit margins over time



Electricity Restructuring by State

Legend:

- Not Active
- Active
- Suspended

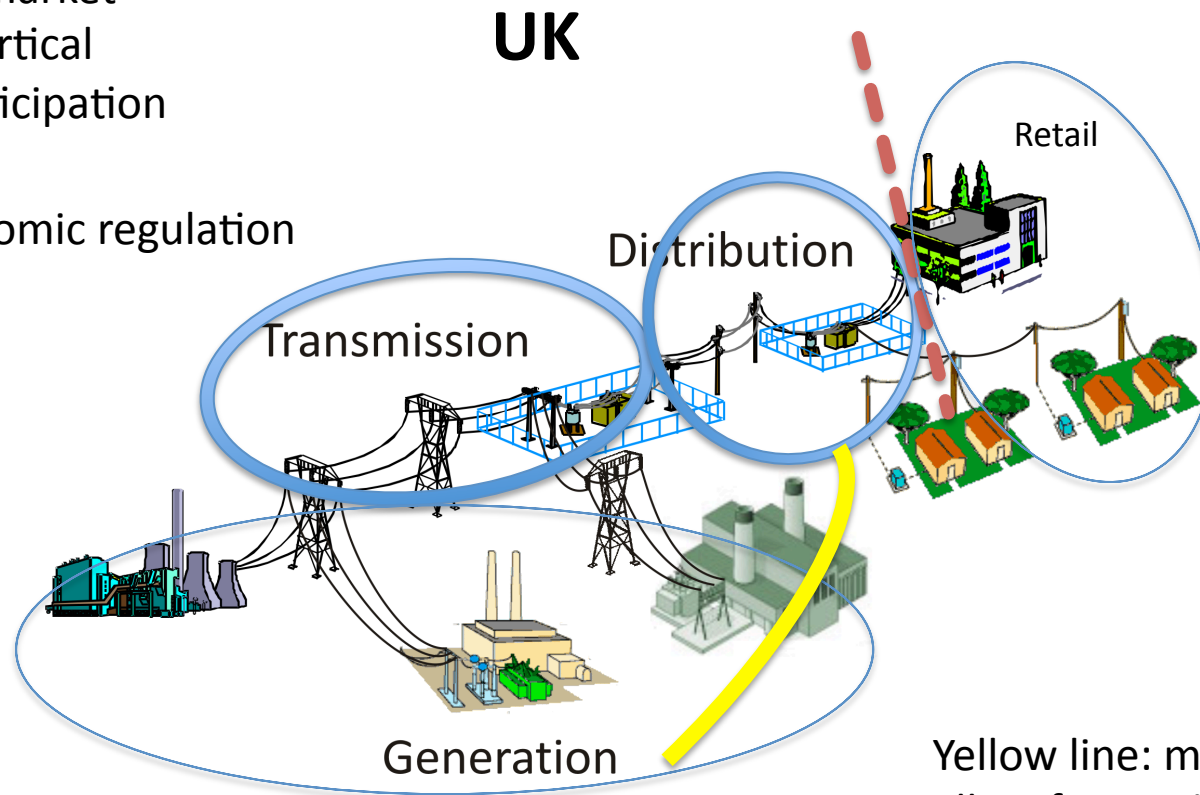
■ Active

☐ Suspended

# Incumbent vertical market power, ownership, & regulatory structure

Dotted red line: market rules allow for vertical downstream participation

Heavy oval: economic regulation

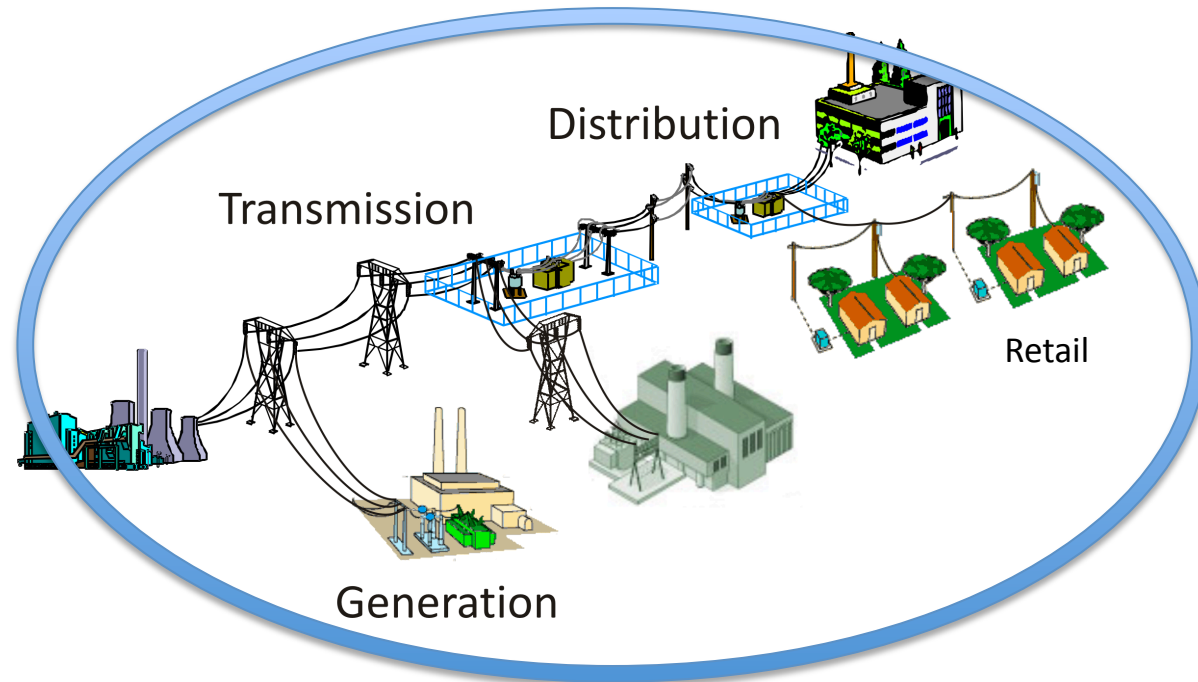


Thin oval: competition

Yellow line: market rules allow for vertical downstream ownership

# Incumbent vertical market power & regulatory design

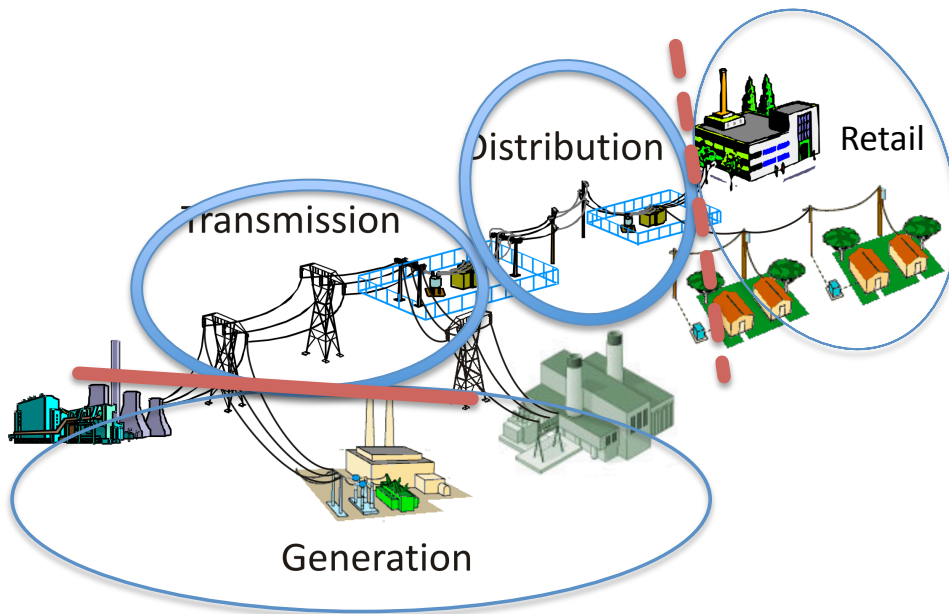
**US traditional: 35 states**



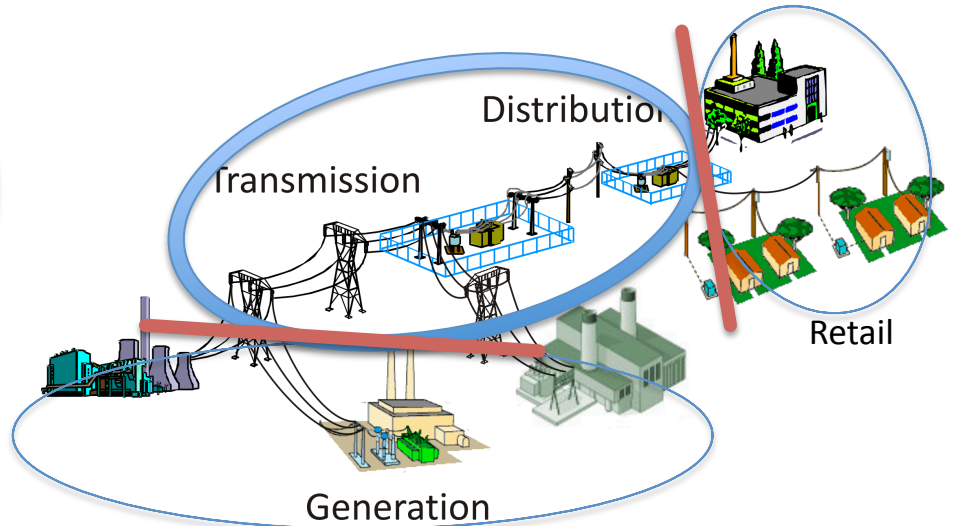


# Incumbent vertical market power & regulatory design

## US restructured: 14 states + DC



## US deregulated: Texas



Furthermore:

- Customers own their data
- Only retailers can provide CPE



Relationship Status:  
**it's complicated**



# Persistent regulatory entry barriers



# Case study: Electricity incumbent default service & the Bell Doctrine



**Citation:** L. Lynne Kiesling, "Incumbent Vertical Market Power, Experimentation, and Institutional Design in the Deregulating Electricity Industry," *Independent Review* 19:2 (Fall 2014)

# Quarantine the monopoly

## **QUARANTINE**



**This is the site of a recent Zombie infestation.  
No unauthorized personnel admitted.**

# Persistent regulatory entry barrier: incumbent default service

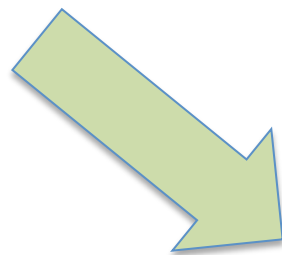
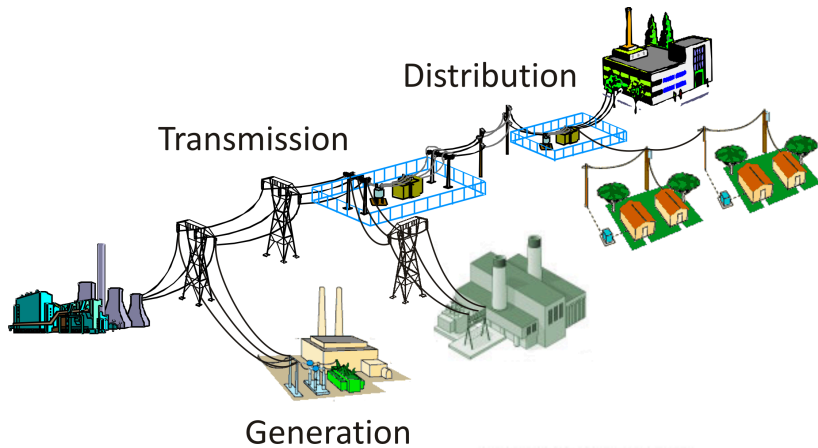
- Incumbent serves all residential customers who “choose not to choose”
- Meant as a transition mechanism, but still in place
- Implemented in all restructured states except for Texas
  - Incumbent prevented from providing retail service in native service territory
  - Regulated wires utilities prevented from providing retail service except through AREPs
- Natural experiment in progress: more robust retail competition in Texas?

# Switching data suggest incumbent default service is an entry barrier

State	Incumbent default service	Residential switching by utility (%)	State	Incumbent default service	Residential switching by utility (%)
Connecticut	Yes	35-40	New Hampshire	Yes	< 1%
DC	Yes	4.6	New Jersey	Yes	6.5
Delaware	Yes	3.0	New York	Yes	19.2 avg. (6-34)
Illinois	Yes	< 1%	Ohio	Yes	0-71
Maine	Hybrid	< 1%	Oregon	N/A	0.0
Maryland	Yes	6.5-18.7	Pennsylvania	Yes	0-35
Massachusetts	Yes	5.7	Rhode Island	Yes	< 1%
Michigan	N/A	0.0	Texas	No	51.0

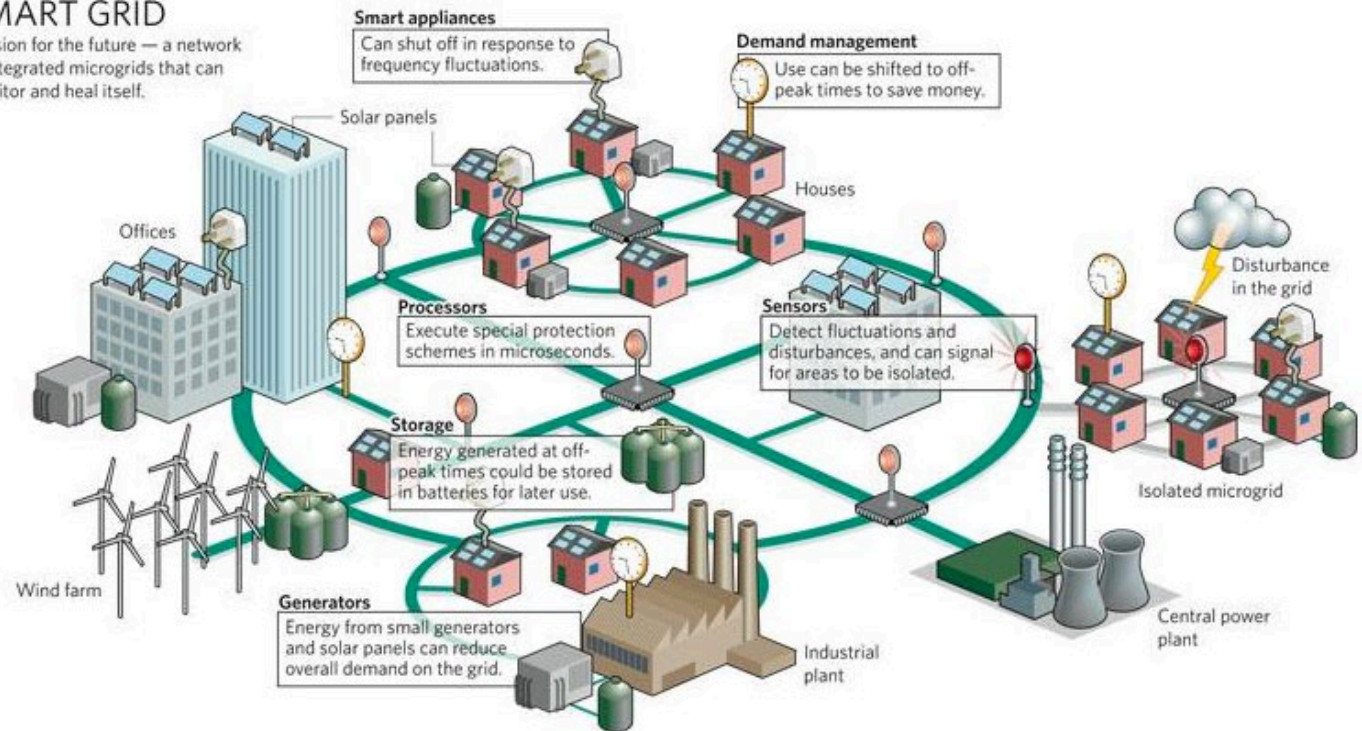


# Barrier to what? Digital innovation at the edge of the network



## SMART GRID

A vision for the future — a network of integrated microgrids that can monitor and heal itself.





# Financial and technological innovation in solar



*NYT Magazine 9 Aug 2012*

Residential retail solar is growing

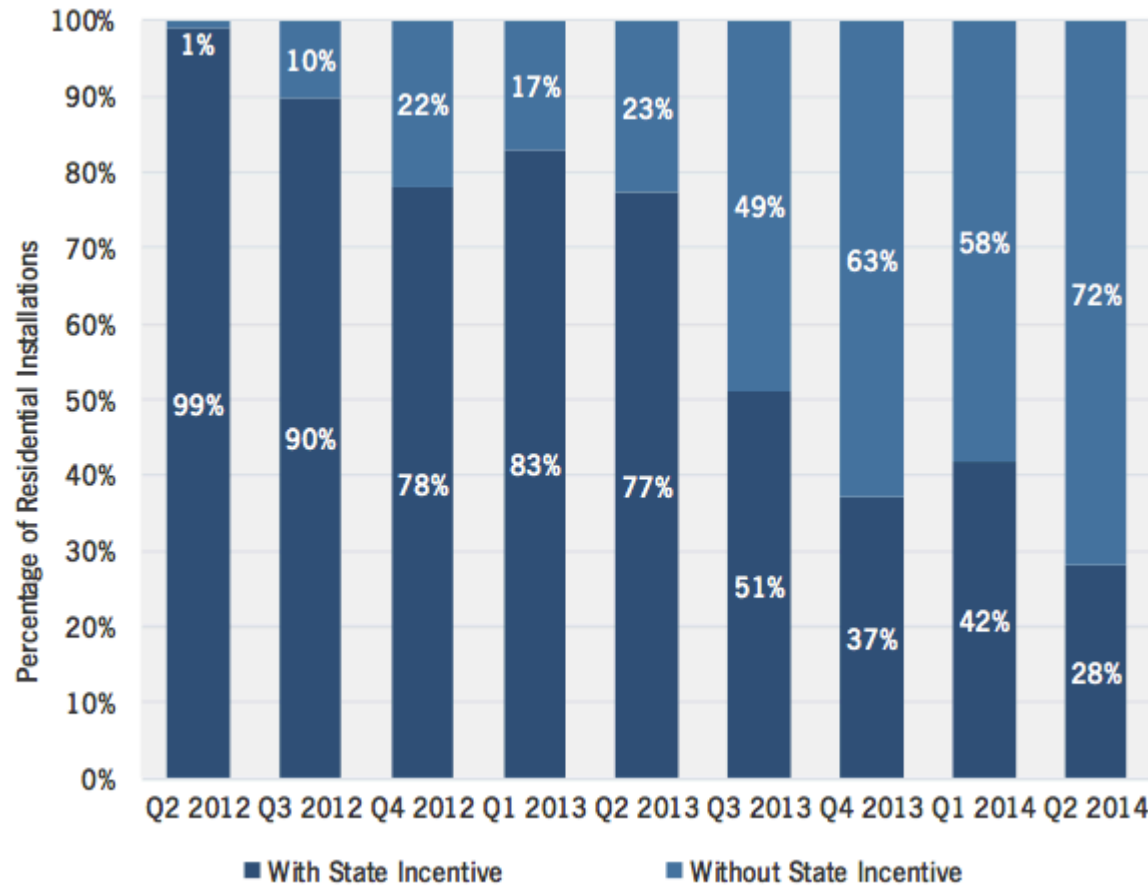
- Post-PURPA (1978)
- PV cost reductions
- Smart grid technologies
- Financial innovation
- Government policies



"The market will get what the market wants, which is low-cost electricity. If you are standing in the way of that tide, good luck." – Danny Kennedy, Sungevity

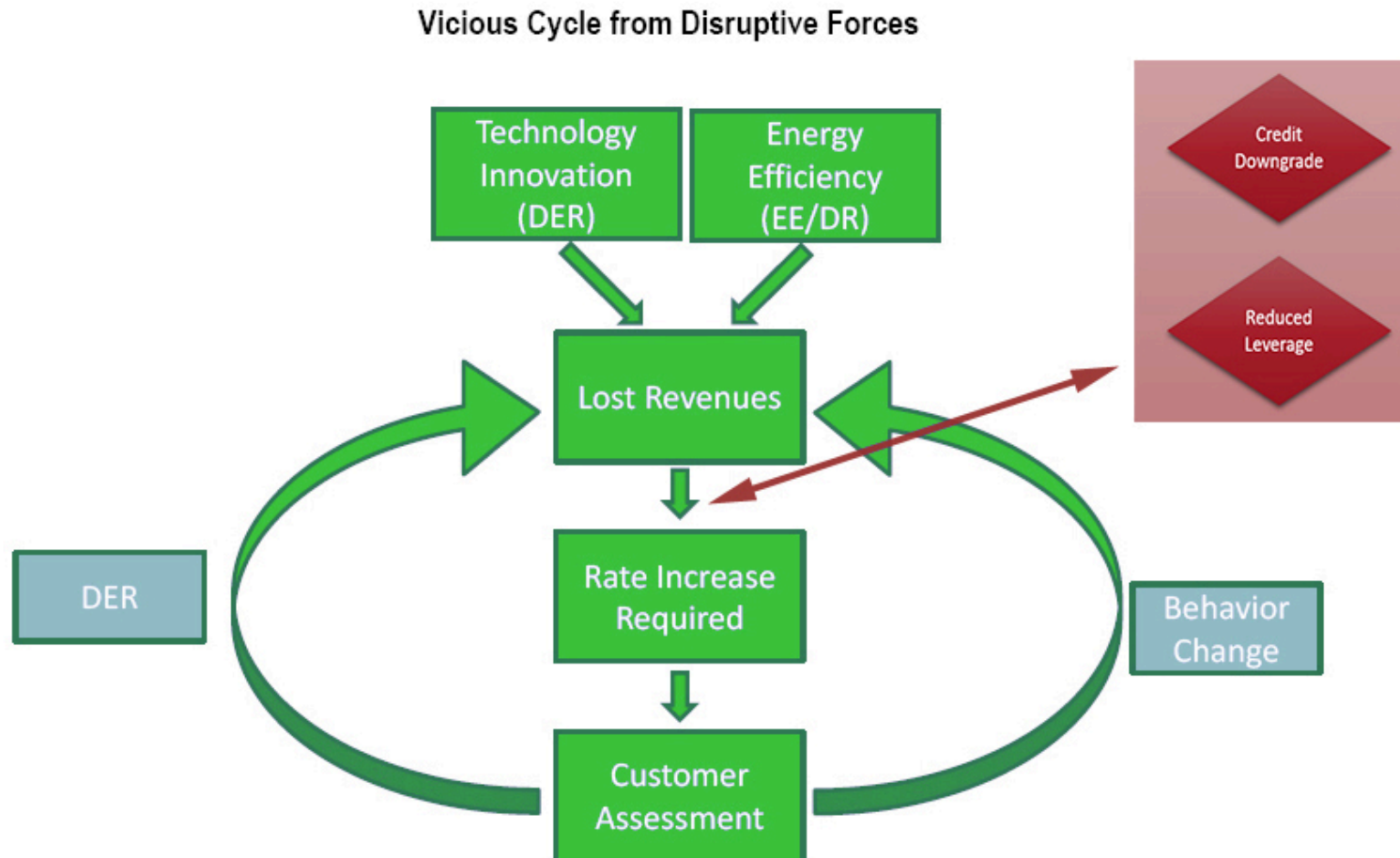


# California residential solar installations without state incentives



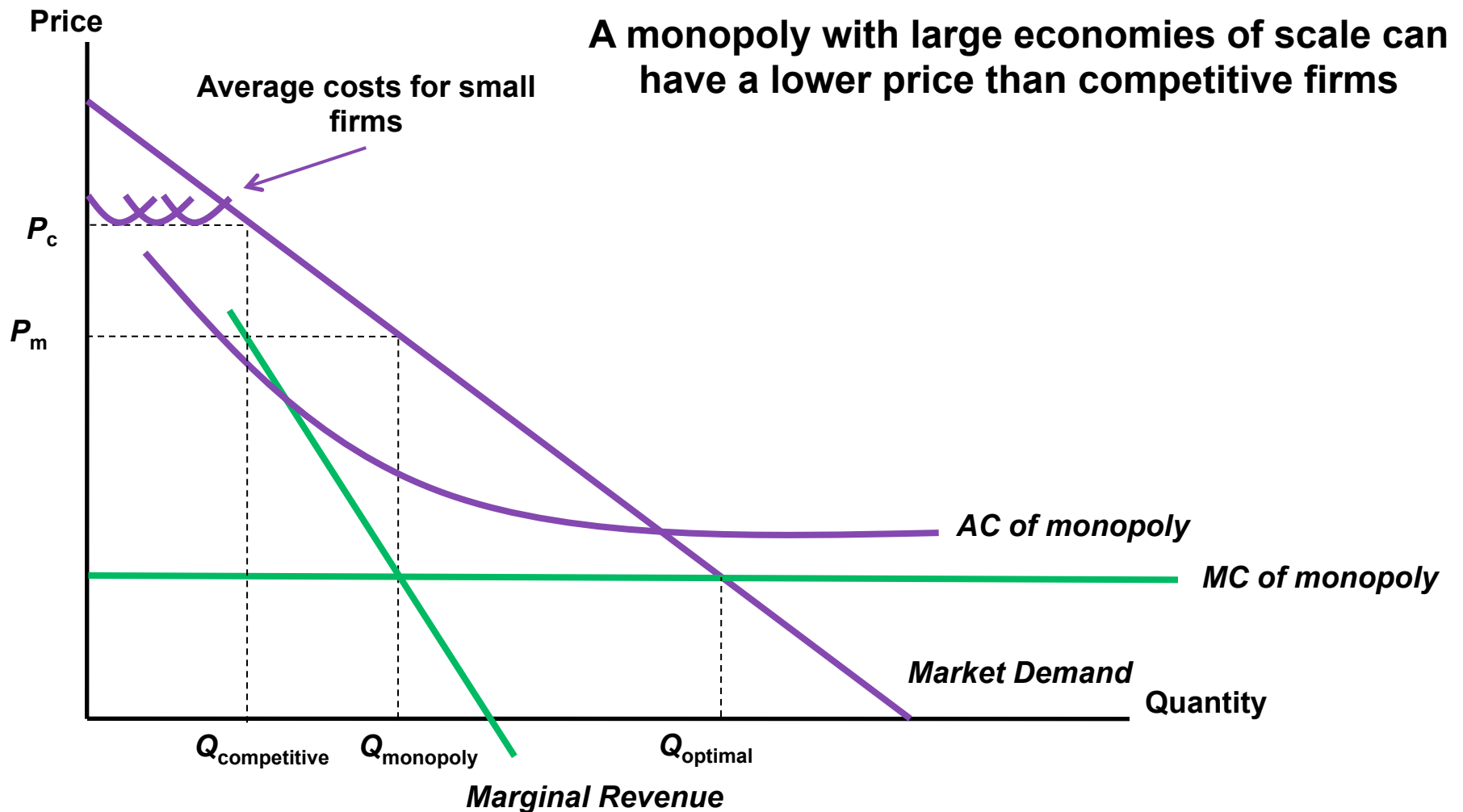
Source: GTM Research, <http://www.greentechmedia.com/articles/read/the-legacy-of-the-california-solar-initiative>

# The “utility death spiral”



Source: William Pentland, “Why the ‘Utility Death Spiral’ is Dead Wrong,” *Forbes*, 6 April 2014

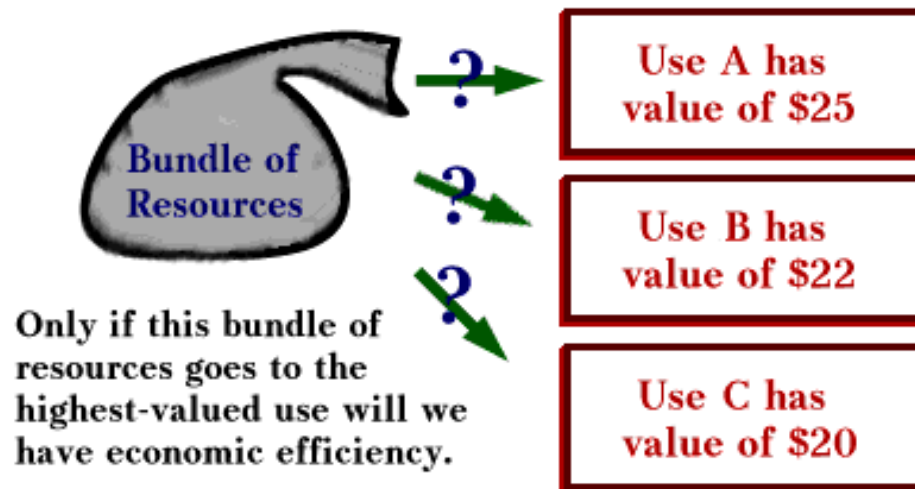
# Static model underlies regulatory theory, practice, institutions



# Is this still a useful model in a dynamic economy?

- Theory is static and institutions/practice are built upon static theory
  - **Schumpeter**: entrepreneurship, innovation, product differentiation, and economic growth, creative destruction
  - Market processes do not create long-run value by getting to  $P=MC$ ; they do so through **experimentation** and learning through trial and error
  - Political economy critique, VHV: “... a serious deficiency of regulation seems to be that it often **fails to ‘disappear’** when the natural monopoly does.”
- Epistemic critique – the **knowledge problem**
  - **Hayek** (1945): market processes aggregate diffuse private knowledge, and centralized processes cannot replicate those processes or outcomes
  - A price is a **signal wrapped in an incentive**, and it emerges from market processes, not from administered cost recovery

# Is regulatory theory and practice suitable to evolving policy issues?



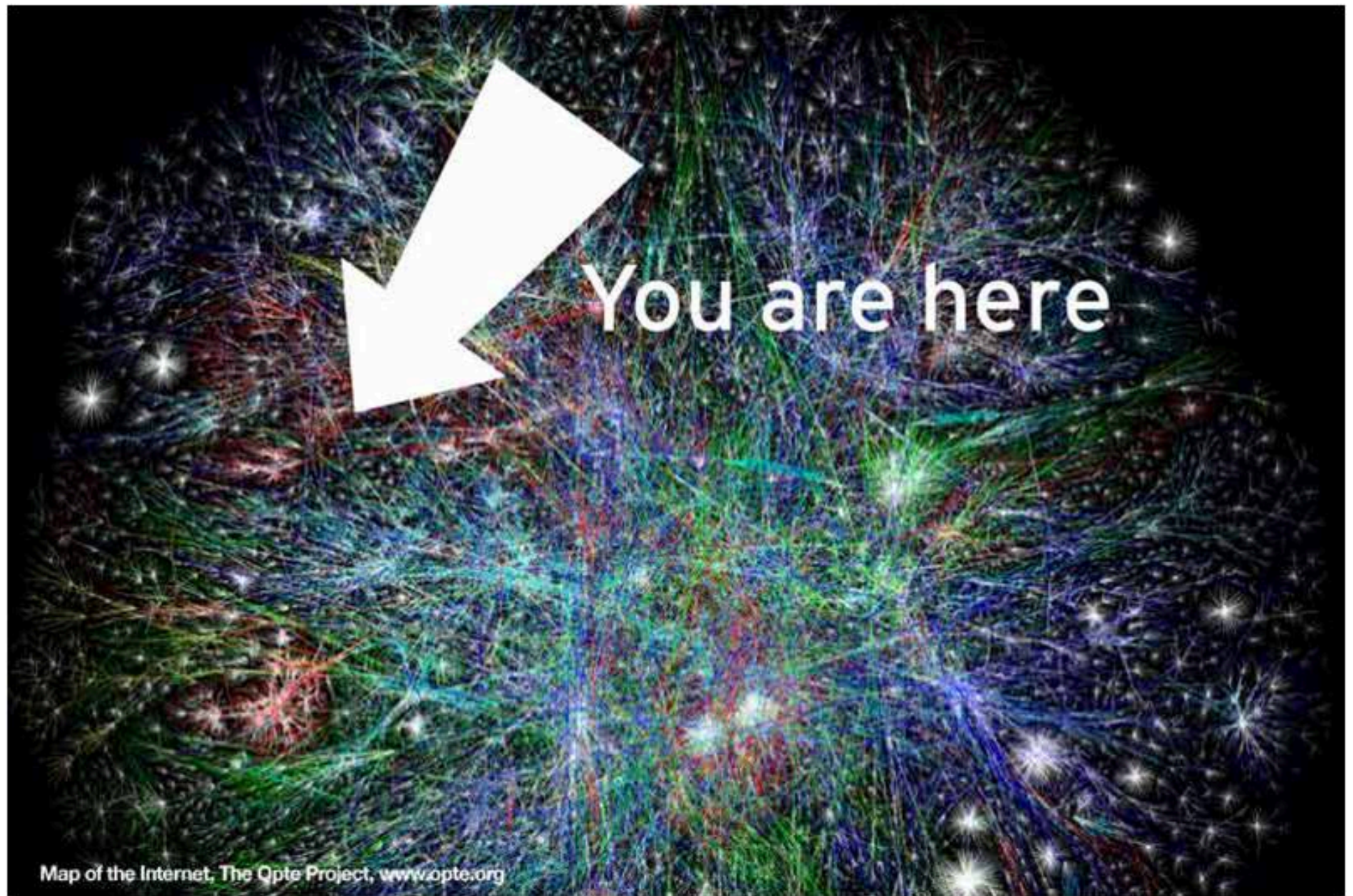
Economic efficiency

Environmental quality



Sources: <http://ingrimayne.com/econ/Efficiency/Nutshell.html>; David Suzuki Foundation





What regulatory institutions are compatible with this complexity and with evolving policy objectives?



Hypothesis: policies enabling experimentation fit a dynamic economy



# Why? 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

# A platform business model: Permissionless innovation in electricity?



Source: EPRI (2011)

# Proposal: Physical + digital platform business model

- Technology platform
  - Common core, heterogeneous periphery
  - Open interface standards
  - Loosely-coupled interoperable system of systems
  - Distributed digital sensing and communication
- Economic platform
  - Facilitate mutually beneficial connection
  - Heterogeneous agents with distributed knowledge & intelligence at the edge of the platform
- Organizational structure
  - Firm
  - Industry
- Compatible & enabling regulatory institutions
  - Competition around the platform
  - Open interoperable standards

# New York Reforming the Energy Vision (REV) proposal

- Staff proposal from NY Public Service Commission
- Policy objectives include consumer-centric approach, markets, climate, alongside reliability and cost-effectiveness
- Proposal: Incumbent utility as a Distributed System Platform (DSP)
  - Enable heterogeneous agents to connect
  - Involves utility ownership of generation and storage technologies for reliability and market liquidity purposes
- Interoperability, non-discrimination, action orientation

# Institutional design: Gardener, not engineer

“If man is not to do more harm than good in his efforts to improve the social order, he will have to learn that in this, as in all other fields where **essential complexity** of an organized kind prevails, he cannot acquire the full knowledge which would make mastery of the events possible. He will therefore have to use what knowledge he can achieve, not to shape the results as the craftsman shapes his handiwork, but rather to **cultivate** a growth by providing the appropriate environment, in the manner in which the **gardener** does this for his plants.”

-F.A. Hayek, Nobel address, December 1974

# Conclusions

- Persistent **incumbent vertical market power** in retail markets is a regulatory choice that stifles **producer and consumer experimentation**
- Experimentation is essential to the dynamic market process, but **absent** from regulation's **theory of competition** regulation
- The Bell Doctrine suggests **to quarantine the monopoly**; among the 16 restructured states, only **Texas** has done so
- The future utility business model as a physical + digital **platform** with permissionless innovation may yield other revenue streams as the value of the wires network diminishes over time
- The regulator's role should be as a **gardener**, not as an engineer – **retail** competition, **tech-agnostic** renewables