

Business strategies for utilities at a time of industry structure dislocation

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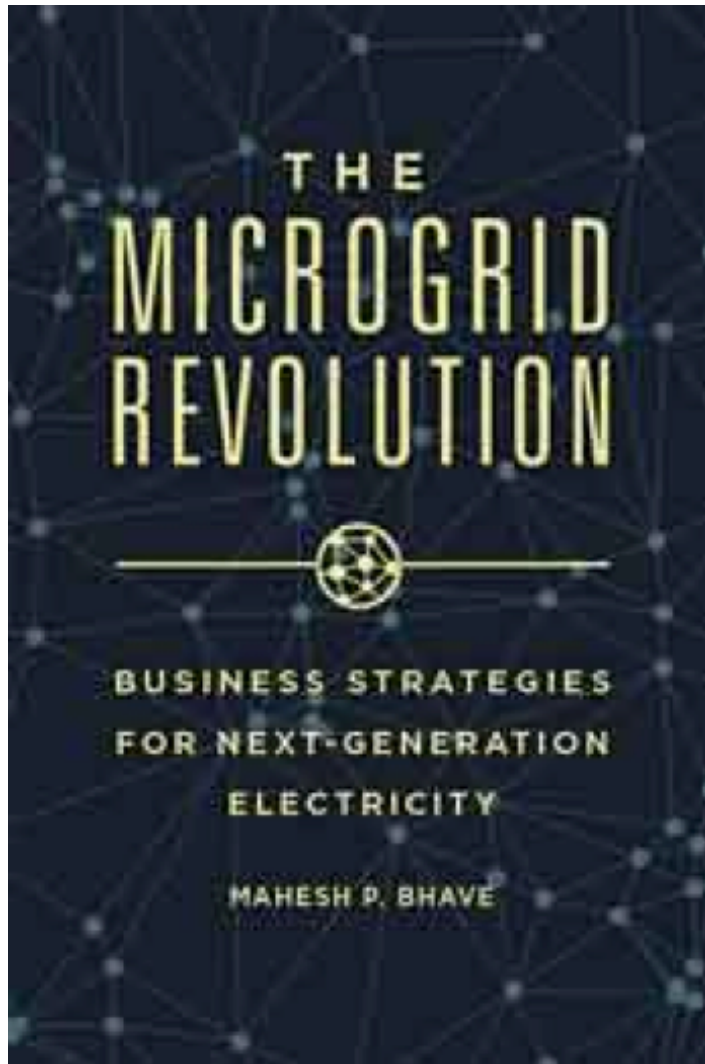
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Amazon:

<https://www.amazon.com/Microgrid-Revolution-Strategies-Next-Generation-Electricity/dp/144083315X>



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- Mahesh is a chemical engineer from Indian Institute of Technology (IIT), New Delhi, and has a masters in public administration and PhD in interdisciplinary social sciences from Syracuse University, New York.
- Mahesh lives in San Diego, California.

Agenda: **Discuss** potential strategies

1. Miniaturize

2. Fractionate

3. Divest, including
Municipalize

4. Consolidate

5. a) Privatize b) Public
Ownership

6. Auction

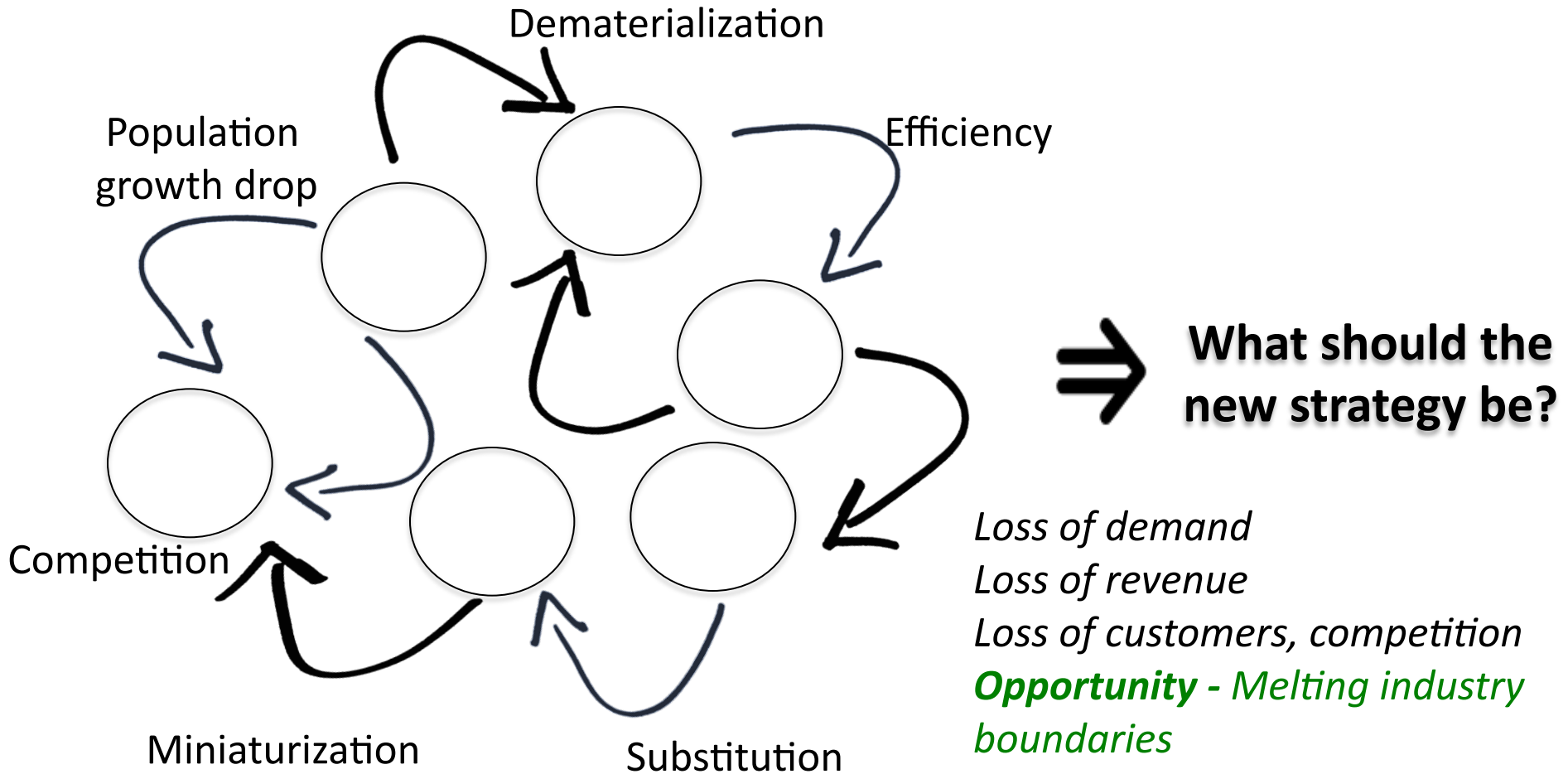
7. Diversify

8. Extend geographically
with specialization

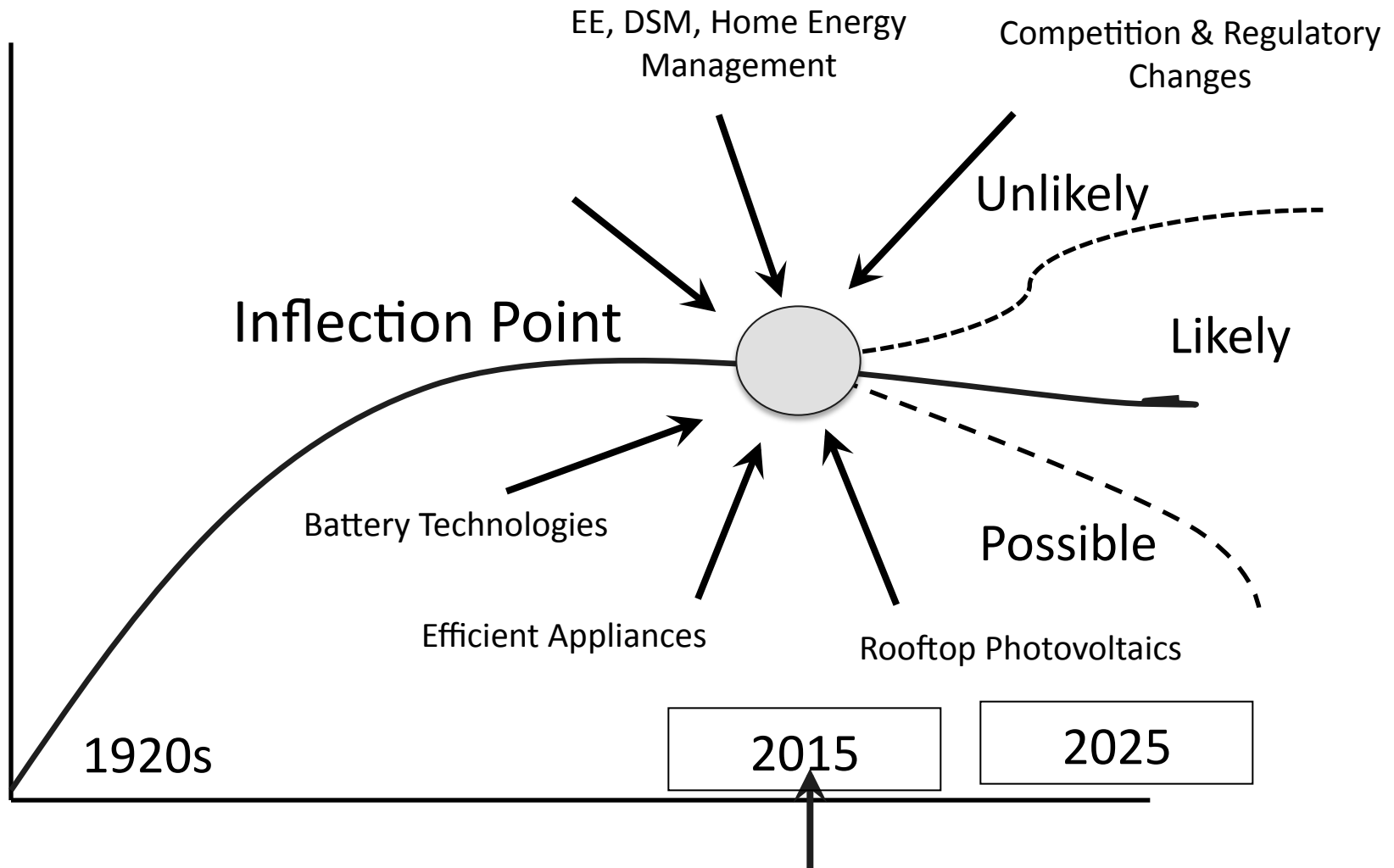
9. Grow intensively in
region

10. Organize differently –
cooperatives, franchises,
Public-Private-
Partnerships ...

Context: Driving forces



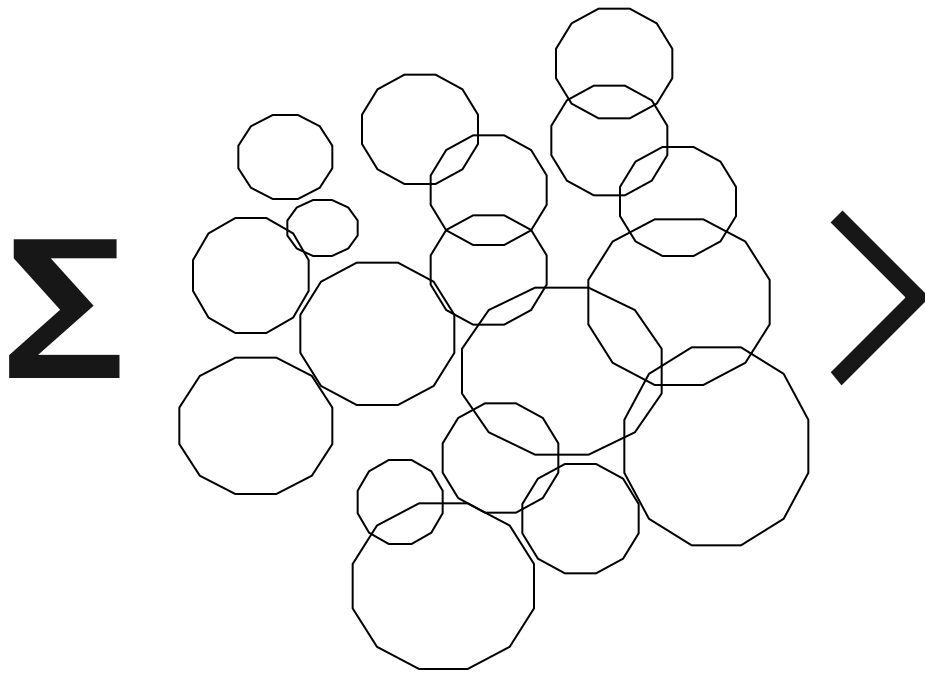
Context: Industry at inflection point



Macro-trends

- Barriers to entry fallen
- Scale economics not necessary for low unit costs
- Natural monopoly dead
- Industry boundaries breached

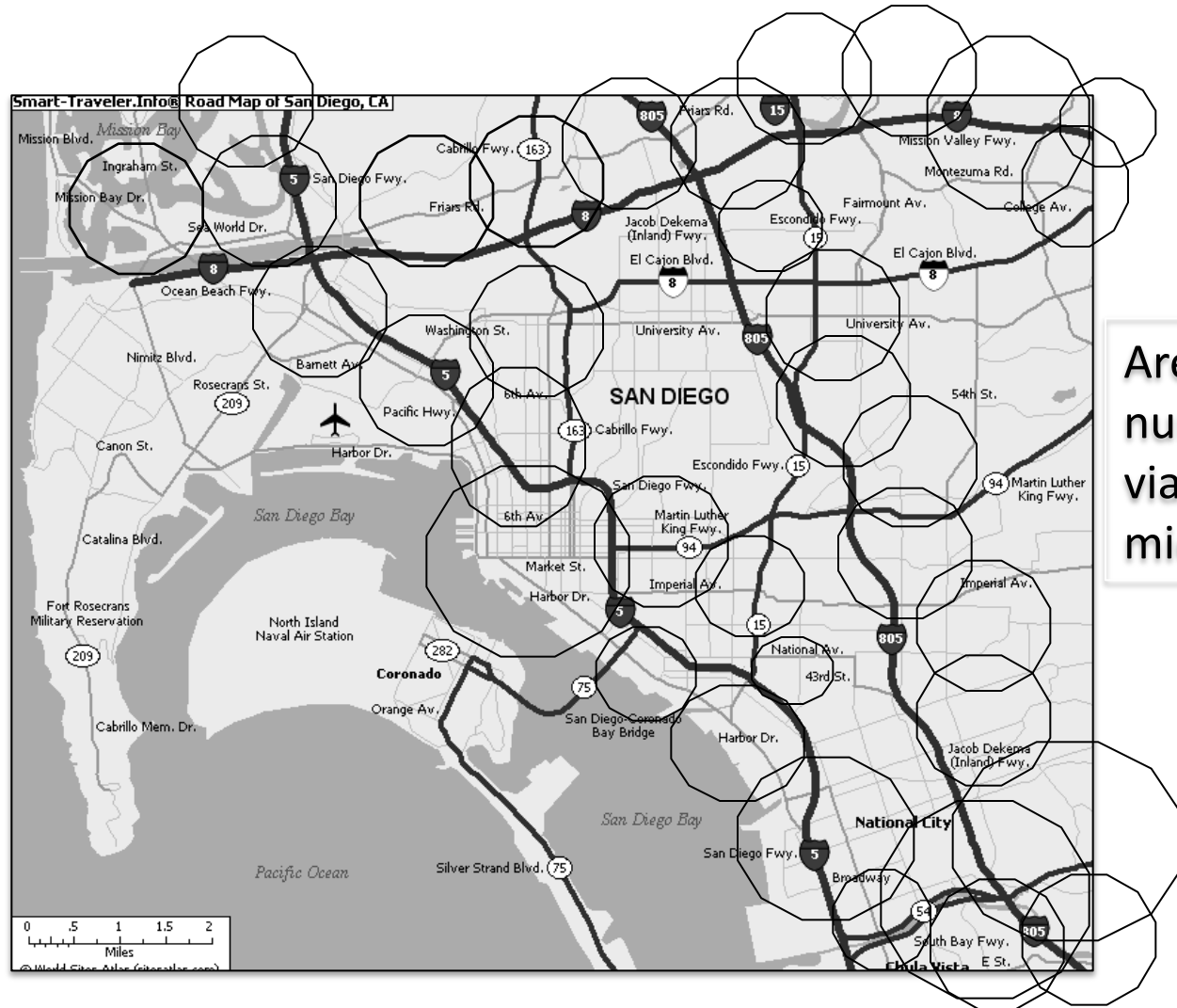
Value from microgrids



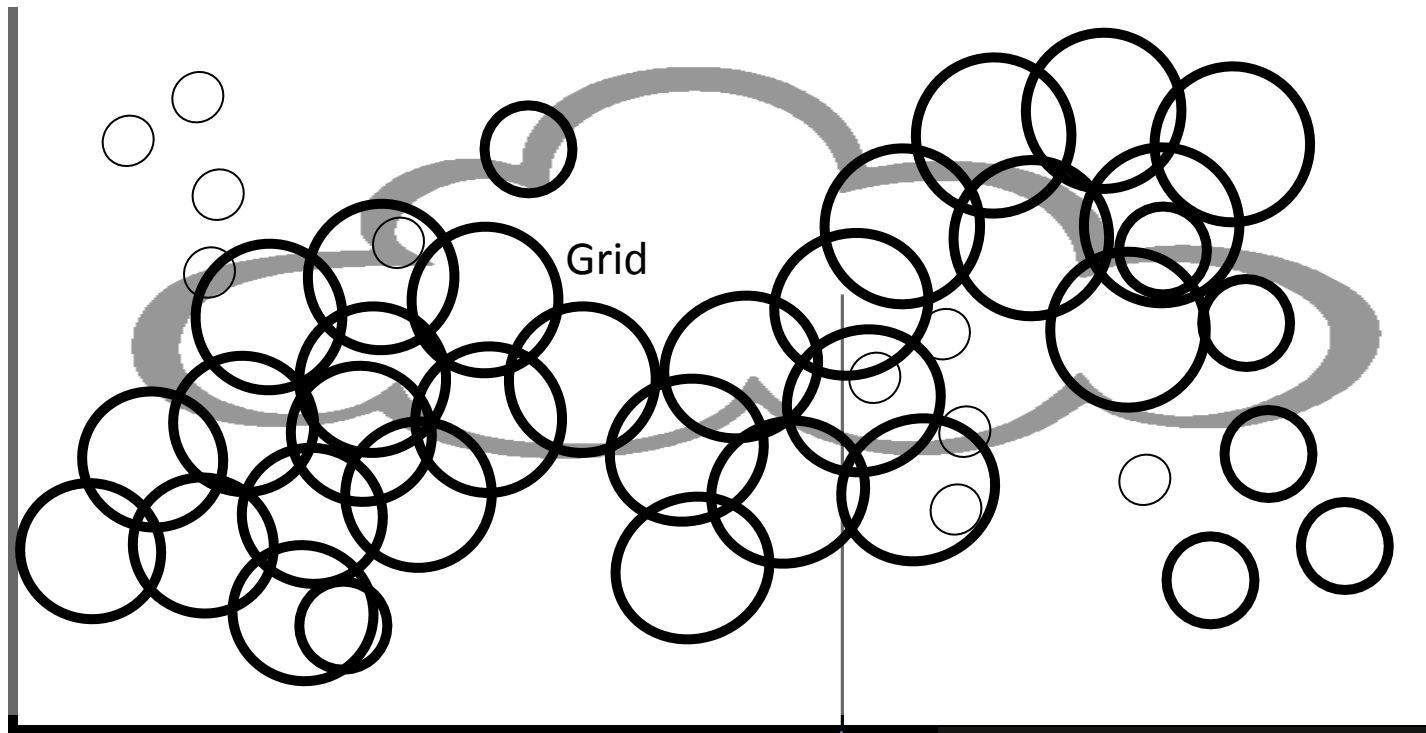
Traditional macrogrid

Hypothesis: For a given service territory and a set of customers, the sum of the value of microgrids exceeds the value of the corresponding macrogrid”

Microgrids – Illustrative topology

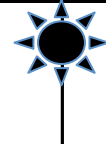


Grid topology evolution



○ = Solar Home System

● = Microgrid



Electricity everywhere

Point of Grid Infeasibility

Microgrids competition: Homeowners' association

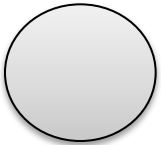


~ 120 homes

~ 1 MW average load

Sufficient rooftop and open space

Substation here



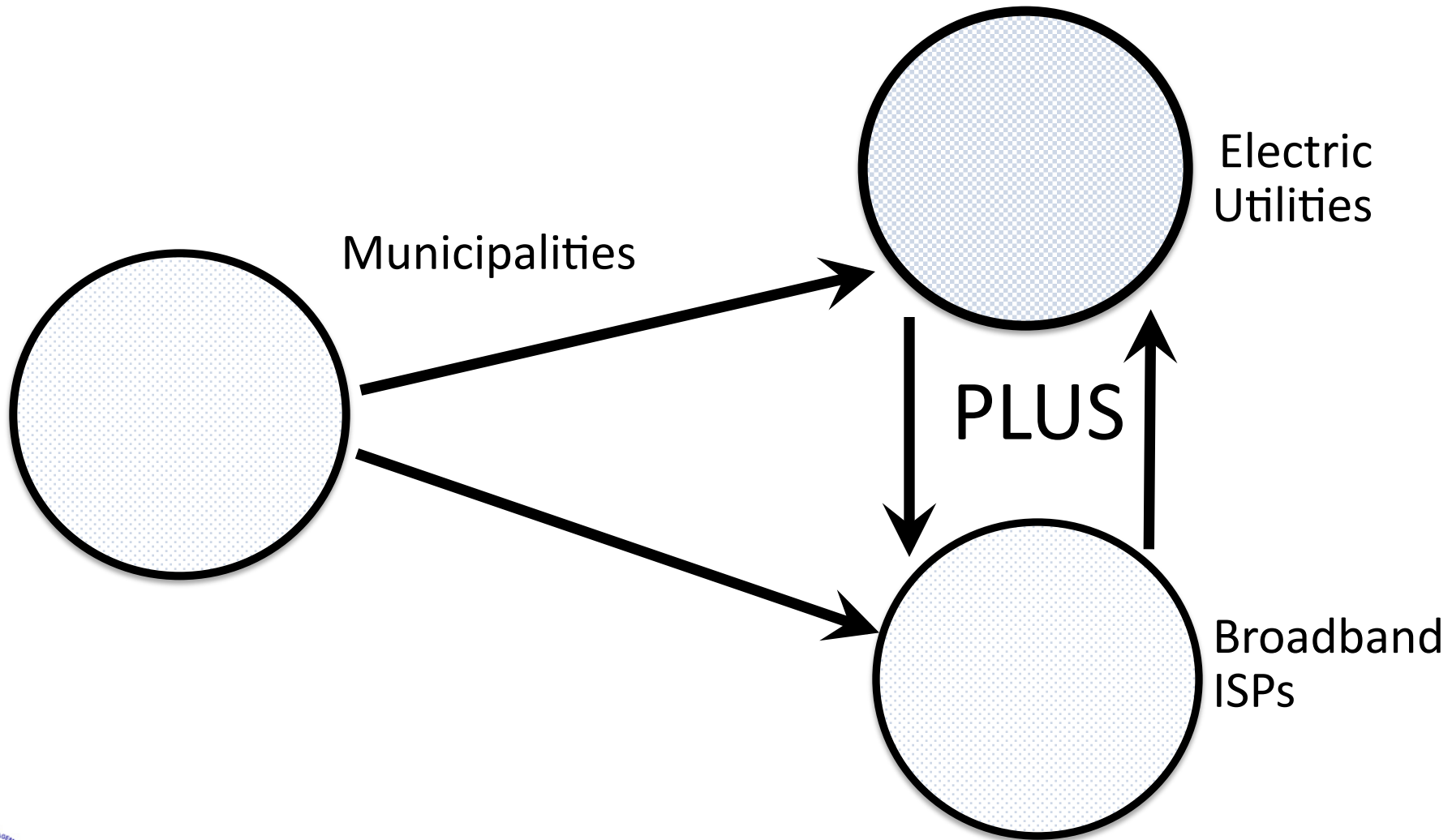
Divest, including Municipalize

- An Investor Owned Utility (IOU) may note
 - fall in demand, due to efficient appliances, the spread of solar systems, ...
 - Inevitable drop in market value, and therefore
- *Divest* as strategy: “if you are falling, dive”
- Opposite of *municipalization*, though qualitatively similar, where a municipality wrests control of a service territory upon expiration of franchise right
- Municipalization as forced divestiture

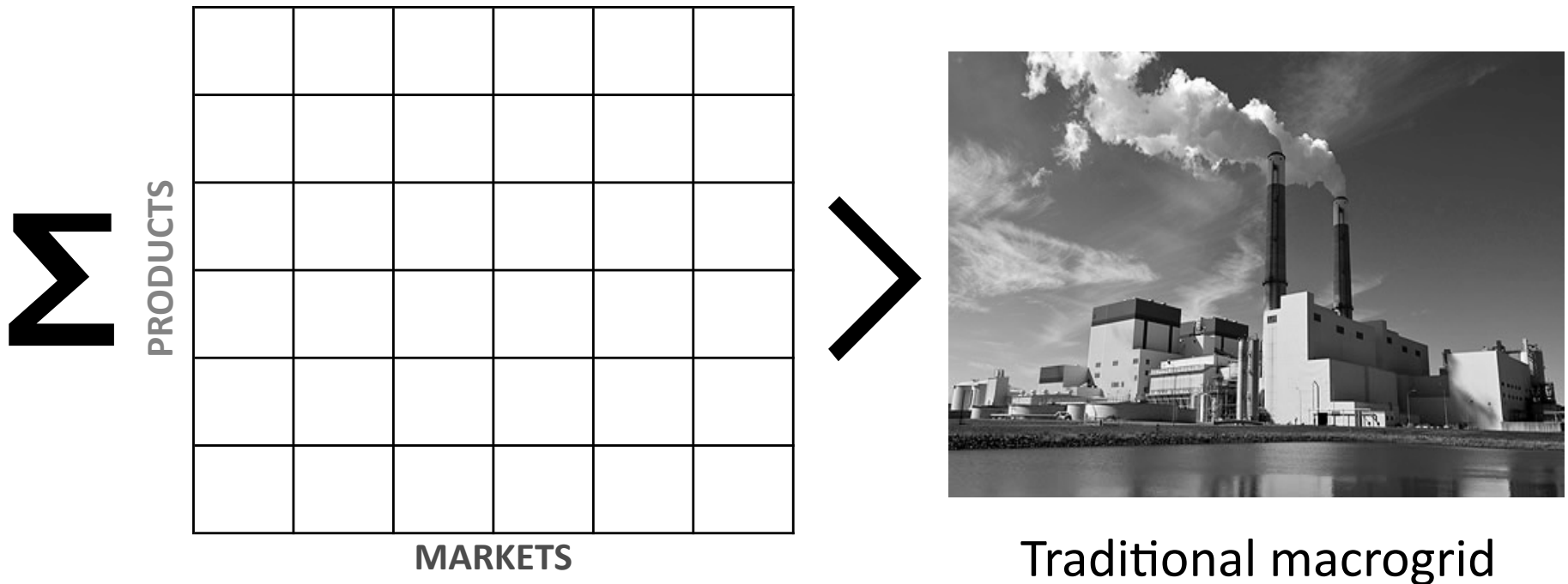
Auction Market Blocks

- Geography may be divided into optimal territories and auctioned off for services
 - Similar to distribution of public, scarce resources, e.g., spectrum by FCC auction
- 2 GHz band auctions in the US in mid-1990s
 - Country divided into 500+ Basic Trading areas; India allocates coal mining rights using auctions
- How to divide geography? By what criteria?

Competition: Municipality into Electricity, ISP Businesses



Value from fractionation



Hypothesis: The sum of the value of “product-markets” exceeds the value of the macrogrid for the same set of customers

Ansoff Matrix: More product, more geography..?

Product: Electricity		Product-Market Matrix: Electricity						
	1							
	2							
	3							
	4							
	5							
	6							
	7							
	...							
		a	b	c	d	e	f	g
		Market						

Franchise boundaries less meaningful

Extend Nationally with Specialization – *Linearly Extensive*

- Seeks scale, therefore lower costs, as also national or global brand
- Through focus and specialization
- For instance, across a nation in solar-powered
 - water pumps for agricultural applications
 - traffic lights
 - street lights on campuses, or city streets



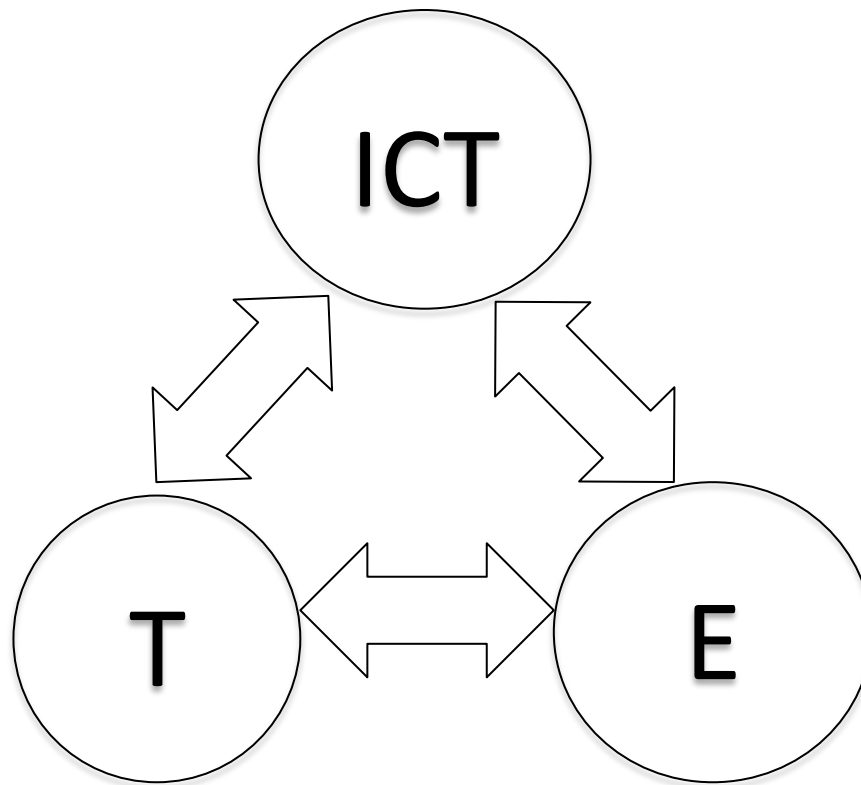
Grow Intensively Within Region

- Electrician as utility – solar installation and maintenance business
- A general contractor focused on a city
- Expand portfolio to energy audits, value-added in premise services, LEED certification, DC overlay infrastructure, ...
- Expand into facilities management
- Scope limited to city

Diversify

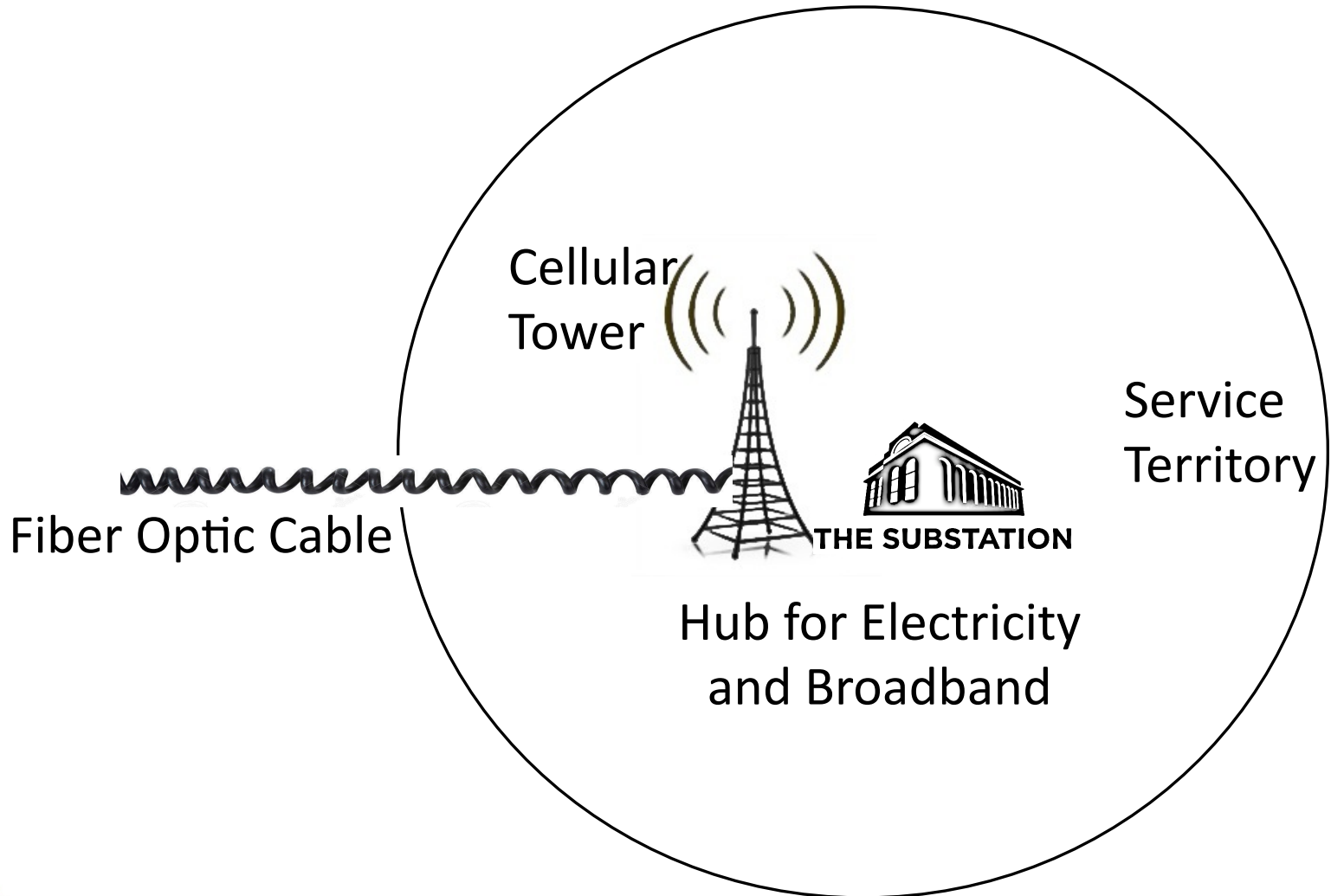
- Electric utilities *as ISPs* by leveraging rights of way, customer access, and assets
- New network services
- *As entertainment companies* over Internet
- Like wireline, wireless phone and cable companies
- EPB in Tennessee,

Fusing of IT, transport, electricity



ICTTE – Or, The Enernet of Things (EoT)

Enter ISP business – Substation + cellular tower as hub



Increased revenue, margins with broadband

		Revenue
		Margin
Revenue	Revenue	
Margin	Margin	
Cost	Cost	Cost
Today's regulated business	Regulated with renewables	Electricity plus ISP business
<i>Economies of scale; large scale generation for unit cost reduction. Prices expected to rise due to rising fuel costs, carbon pricing, demand drop, and grid defection</i>	<i>Economies of numbers; large numbers for unit cost reduction. Somewhat expensive today, costs likely to fall leading to improved margins</i>	<i>Economies of numbers + business expansion by leveraging current assets - rights of way, poles, cabling...</i>
Up to 2020	2020 through 2030	2015 through 2040 and beyond

Business development, entrepreneurial opportunities, *or competition*

LOCATION	Generate, Use, Buy, Sell	Shopping Mall	✓✓	✓✓	✗	✓✓	✗
	Generate, Use, Buy, Sell	Home: Rooftop & Inside	✓	✓	✓	✓	✓
	Generate, Use, Buy, Sell	High Rise Office Building	✓✓	✓✓✓	✗	✓	✓
	Generate, Use, Buy, Sell	School Yard & Parking Lot; Inside	✓✓	✓	✗	✓✓	✓
	Generate, Use, Buy, Sell	High Rise Residential Building	✓	✓✓✓	✓✓✓	✓	✓✓✓
	Generate, Use, Buy, Sell	College Campus	✓✓	✓✓	✓	✓✓	✓✓
			Lighting	Energy Efficiency	Cooking	Air Conditioning & Heating	Hot Water
MARKET							

“Dear Electric Company CEO: Merry Xmas”

*“Your bankers never told you this, the ratings agency hasn’t downgraded your bonds and you’ll never convince your board of directors. So, let’s add really stockholder-friendly advice. **Sell the company now for top dollar.** Right now, yield starved investors, infrastructure funds and utilities looking for “earnings accretive” growth-by-acquisition want properties. **Sell now while your business still looks attractive** and low interest rates make deals look good.”*

– Leonard Hyman & William Tilles, Dec 22, 2015

