

Changing Utility Regulation and Business Models in the U.S.

Dr. Miriam Lev-On
Dr. Perry Lev-On
The LEVON Group, LLC

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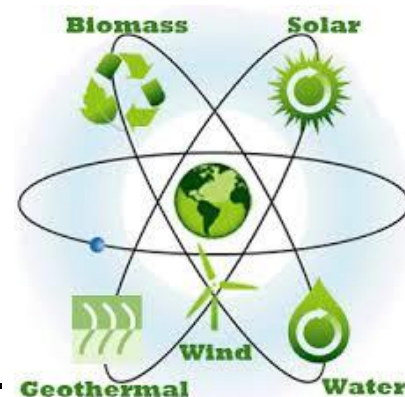
New Utility Business Models

- Much of the U.S. electric power sector has changed little over the past 100 years
 - Electric utilities business models are rapidly becoming outdated
 - New, innovative technologies, including renewable energy technologies, are proliferating to meet demand
 - These changes are disrupting the “old” relationships between traditional utilities, regulators, and customers
- A whole new electricity generation and distribution value chain is needed to meet Climate Goals
- For Electric utilities to remain healthy contributors to America’s energy future, their business models must evolve



Drivers to Change Utility Business Models

- Efficiency, conservation and renewable generation are advanced by government policies to meet climate change goals, energy security, and economic and job growth
- Utility revenue models are still based on a balance of the fixed capital expenditures and variable cost recovery
- Decline in overall consumption from centrally-generated sources requires new pricing models



Utilities will have to balance public policy objectives with revenue requirements in order to maintain service and reliability levels



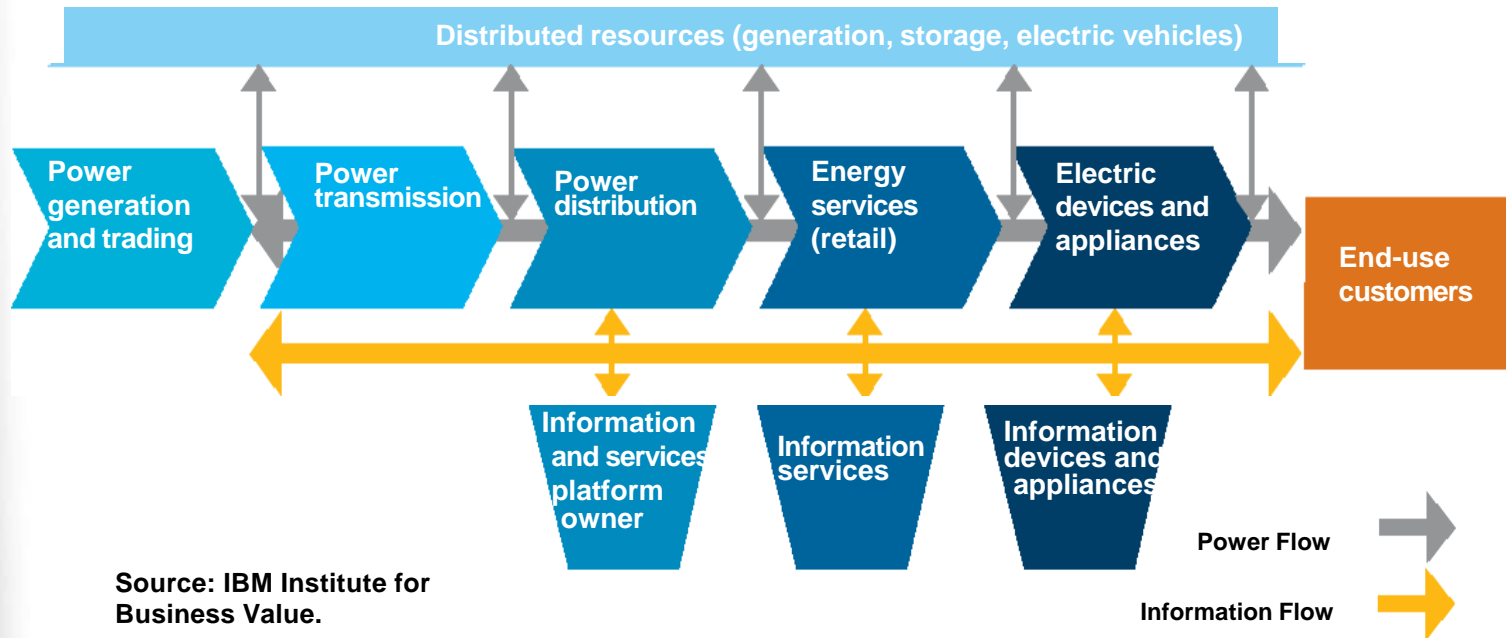
Evolution of the Utility Value Chain

- Consumers are becoming an active, empowered participants requiring integration into the network
 - Both information and power will flow in multiple directions
- Distributed resources (e.g. distributed generation, storage and electric vehicles) will play an increasingly vital role in both operations and value creation
 - May disrupt the value chain portion that is comprised of the traditional generation-transmission-distribution-retail electricity
- information, and access to personal connections & networks will become the new revenue sources



The Industry's New Value Model

Emerging Electricity Value Chain – new information model

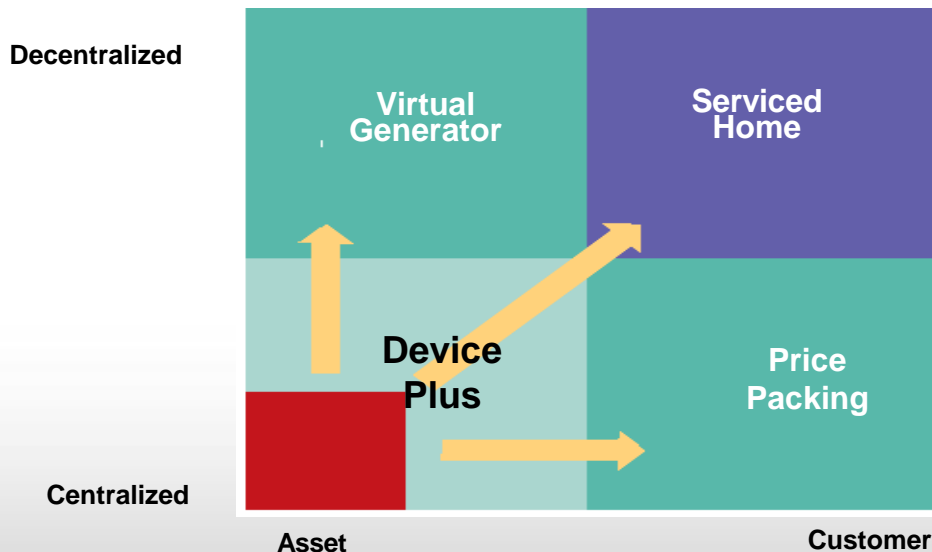


Traditional Electricity – one way flow of information



Potential Future Models

- Centralized vs. decentralized generation technologies
 - Will companies retain a focus on large centralized generation assets or transition into a varied mix of decentralized technologies?
- Asset focus vs. customer focus
 - Will energy utilities continue to focus on “upstream” generation and distribution of power using traditional assets, or move to a customer-focused business where energy supply is only one of a suite of services provided?



Source: A. D. Little, PRISM
The Future of Energy Utilities, 2013



Examples of USA Potential Implementation

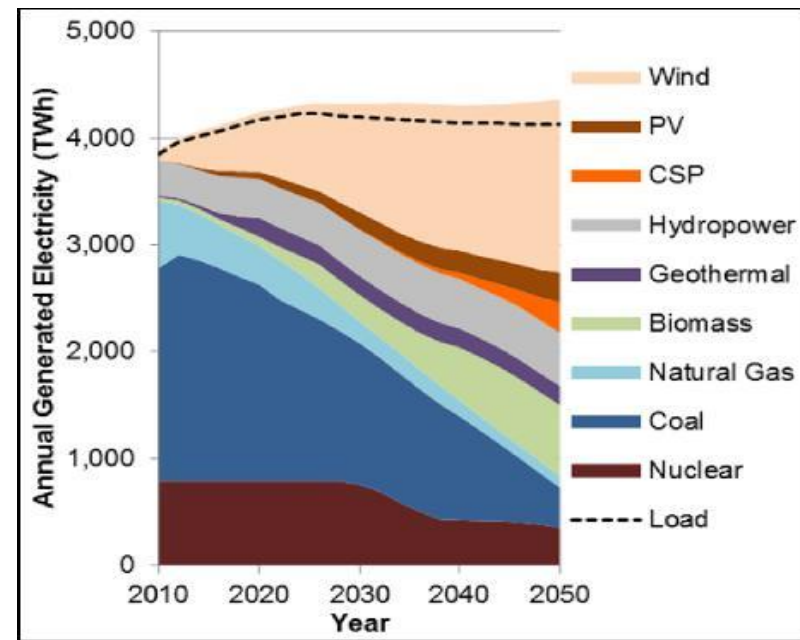
- The variety of utilities and market circumstances in which they serve has resulted in different business models among the roughly 3000 utilities in the U.S.
 - Investor owned utilities (IOUs) serve the bulk of U.S. electric power
 - Regulated by a combination of federal and state governments
- In some states, consumers can choose their power supplier
 - Regional Transmission Organizations (RTOs) or Independent System Operators (ISOs) dispatch all generation based on competitive bidding and dispatch in order of lowest marginal cost
- Impetus for Change
 - Aging plants and infrastructure
 - Tougher environmental requirements
 - Technology costs, consumer demands and Policy Trends
 - Liability cost, fuel costs, and climate change risks



Renewable Electricity Futures in the U.S.

- NREL investigated the extent to which renewable energy can meet the electricity demands of the contiguous U.S. to 2050
 - Implications and challenges of various renewable electricity generation levels
 - Focus on 80% of all U.S. electricity generation from renewables in 2050
- Figure shows NREL's baseline scenario
 - Energy mix progressing from the actual 2010 portfolio to a proposed 2050 scenario.

NREL: U.S. DOE National Renewable Energy Laboratory



Source: NREL's Futures "Prism" Analysis of baseline scenario

Renewable energy comprises only about 12% of U.S. electric energy in 2010 but could make up 81% of the energy mix by 2050



California: Energy Path For the Future

California's renewable and distributed energy efforts are among the most far-reaching in the United States

- California's climate change law (AB 32) mandates the use of renewable power for 33% of California's electricity supply by 2020
- Governor Brown's goals are to develop 12,000 MW of distributed generation by 2020 and 6,500 MW of combined heat and power (CHP) by 2030
- To achieve these goals California began:
 - phasing down Utility-scale, fossil-fired power plants;
 - putting in place a new system driven by renewable and distributed power of all sizes and technologies, owned by customers, utilities and third parties alike;
 - expanding an overlay of demand-size resources and new information technology



Transforming California's Electric System: Issues and Possible Actions

A study by the Hoover Institution Shultz-Stephenson Task Force on Energy Policy (www.hoover.org/taskforces/energy-policy) raised the following issues:

- Are the traditional electric system regulator and utility institutional structures sufficient to support a massive transformation?
- No single state entity is in charge of integrating initiatives and addressing gaps, decision making is slow and there is no consolidated roadmap and decision-making schedule!
- As California seeks to transform its electricity system, investor-owned utilities face a regulatory system that penalizes innovation and risk-taking, a potentially diminished service base, and an unfamiliar, competitive energy-service landscape
- California's experience suggests that an ambitious scale-up of utility-scale renewables and distributed power systems requires an equally ambitious structural reform in the existing regulatory framework and the traditional regulated utility business model

[The issues above may equally apply to other states or nations]



Transforming California's Electric System (cont.)

Without reforms, California's ability to achieve its clean energy transformation goals, while not jeopardizing its reliable and affordable electricity system, is at risk

Possible actions to address these institutional issues:

Short Term:

- Identify a lead agency; develop a consolidated program document, and agency decision-making schedule for California's renewable and distributed resources goals, with public meetings to report progress
- Publicly release program costs and actively identify potential systemic economic and operational risks
- Address the problems inherent in cost-shifting to a narrow base of customers and identify rate options that encourage long-term public support for distributed power



Transforming California's Electric System (cont.)

Longer Term:

- Establish clear agency responsibility for renewables and distributed energy programs, and adopt consistent decision-making criteria across planning, procurement programs, and agencies
- Reform agency decision making to cross agency to identify and resolve development risks and to rapidly expedite timelines
- Develop an investment plan for California that identifies the full range of possible costs and pathways to maximize private investment and lower costs
- Adopt new business models for utilities that provide incentives to drive the desired transformation in an efficient and innovative way, and revise the way utilities are regulated to support decentralization of California's electric system and investment in new technologies
- Create sustainable pathways for non-utility entities to provide energy services



New York: Reforming the Energy Vision

To meet the challenge of the transition in the energy industry, the New York State Public Service Commission commenced its Reforming the Energy Vision initiative to reform New York State's energy industry and regulatory practices (14-M-0101: Reforming the Energy Vision – REV)

This initiative will lead to regulatory changes that promote:

- More efficient use of energy;
- Deeper penetration of renewable energy resources such as wind, solar;
- Wider deployment of “distributed” energy resources such as micro grids, on-site power supplies, and storage;
- Greater use of advanced energy management products to enhance demand elasticity and efficiencies

These changes, in turn, will empower customers by allowing them more choice in how they manage and consume electric energy



A Vision on How to Accomplish the New York Commission's Objectives

The Commission has identified six core policy outcomes relating to:

- Customer knowledge;
- Market animation;
- System-wide efficiency;
- Fuels and resource diversity;
- System reliability and resiliency and;
- Carbon reduction



A Staff Report and Proposal (DPS Staff Issues Straw Proposal, August 22 2014) sets forth a vision for how to accomplish the Commission's objectives.

The proposal describes how customer-side resources can become a primary tool in the planning and operation of the utility system, which will improve system efficiency and enable the deployment of cleaner and more resilient technologies.

The Report further explains how reforms in the utility ratemaking process will be necessary, to provide the correct incentives for utilities and markets to develop a cleaner and more efficient electric system.



Summing-Up Policy Implementation Needs

- A clear and well-communicated vision and strategy for future positioning, based on sound analysis of the value creation potential and competitive positioning of companies under different options
- A well-defined technology strategy which underpins the strategy and also clearly identifies the required technology capabilities and the actions needed to attain success
- A detailed roadmap of actions to move the utility business from where it is today to the desired future state, including investments, divestments, partnerships, R&D priorities, and new products and services





Thank you for your attention

Contact Information
The LEVON Group, LLC
levon@levongroup.net