

What's New in Energy Finance?

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OVERVIEW:

TWO EMERGING TRENDS

I. Renewable Energy has
Increasing Access to Capital
Markets

II. The Utility Business Model faces
Major Changes

Renewable Power Sector – Increasing Access to Capital Markets

SECTION I

Top 20 U.S. Wind & Solar Portfolios

Significant scale established by several platforms

	Company	Wind (MW)	Solar (MW)	Total (MW)
1	NextEra Energy, Inc.	8,213	193	8,406
2	Iberdrola SA	5,443	56	5,499
3	EDP Renewables	3,637	–	3,637
4	NRG Energy, Inc. ⁽¹⁾	1,700	1,140	2,840
5	E.ON	2,724	–	2,724
6	Invenergy LLC	2,591	20	2,611
7	BP plc	2,600	–	2,600
8	MidAmerican Energy Company	2,285	–	2,285
9	Duke Energy	1,627	104	1,731
10	MidAmerican Renewables ⁽²⁾	381	1,271	1,652
11	Exelon Corporation	1,300	240	1,540
12	ArcLight Capital Partners LLC ⁽³⁾	1,441	89	1,530
13	EDF Renewable Energy, Inc.	1,285	243	1,528
14	AES Corporation	1,275	–	1,275
15	Infigen Energy Limited	1,089	–	1,089
16	PacifiCorp	1,031	–	1,031
17	First Wind Holdings, Inc.	1,020	–	1,020
18	Sempra Energy	541	333	874
19	Pattern Energy Group Inc.	778	–	778
20	Puget Energy Inc.	773	–	773
	Total	41,734	3,689	45,423







Source: Company filings, investor presentations, and SNL.

(1) Includes Edison Mission Energy, NRG Yield, and NRG Solar.







(2) Includes MidAmerican Solar and MidAmerican Wind.

(3) Includes Terra-Gen Power assets.

Precedent North American Wind Stake Sales

Seller	 edp renewables	 Invenergy	 edp renewables
Buyer	 BOREALIS Infrastructure	 Caisse de dépôt et placement du Québec	 FIERA AXIUM INFRASTRUCTURE
Date	12/20/12	1/8/13	9/10/13
% Stake / \$ Invested	49% / \$230 million	Unspecified minority stake \$500 million	49%
Overview		<ul style="list-style-type: none"> ▪ 1,500 MW in 13 operating wind farms in the US and Canada 	<ul style="list-style-type: none"> ▪ 97 MW in Oregon
Commentary	<p>2007 and 2008 CODs All contracted with long term PPAs in place Investment sits behind a tax equity partnership EDPR will continue to operate the projects First of EDPRs “asset rotation” transactions that it intends to continue pursuing</p>	<ul style="list-style-type: none"> ▪ Long term contracted portfolio ▪ Enables CDPQ to broaden its portfolio in renewable energy 	<ul style="list-style-type: none"> ▪ April 2009 COD ▪ 20-year PPA expiring April 2029 ▪ EDPR will continue to operate the projects ▪ EDPR is continuing its “asset rotation” strategy through this trade and allows EDPR to redeploy capital into new projects

Precedent North American Solar Stake Sales

Seller			
Buyer			
Date	11/19/12	5/21/13	6/28/13
% Stake / \$ Invested	9.61%	50% / 50%	45%
Overview	<ul style="list-style-type: none"> ▪ Long Island Solar Farm ▪ 32 MW in New York 	<ul style="list-style-type: none"> ▪ Copper Mountain II <ul style="list-style-type: none"> – 150 MW in Nevada ▪ Mesquite Solar I <ul style="list-style-type: none"> – 150 MW in Arizona 	<ul style="list-style-type: none"> ▪ Alamosa Solar located in Colorado ▪ SEGS I & SEGS II power plants, located in California
Commentary	<ul style="list-style-type: none"> ▪ 20-year PPA with Long Island Power Authority ▪ BP continues to own and operate the solar farm ▪ Construction cost of ~\$293 million 	<ul style="list-style-type: none"> ▪ Agreement to partner with Sempra on the projects ▪ Sempra will continue to provide operations and maintenance services to both plants ▪ Mesquite Solar I has a 20-year PPA with PG&E <ul style="list-style-type: none"> – Department of Energy's Loan Program Office awarded a \$337mm loan guarantee for construction in 2011 ▪ Copper Mountain II is expected to be finished by 2015 	<ul style="list-style-type: none"> ▪ Carlyle acquired the remaining 45% interest from its original acquisition in 2012

What Factors Are Driving the Increased Access to Capital for Renewables?

- Social Support & Political will have successfully advocated for non-Carbon power generation policies.
- Advocacy has led to regulatory policies in place that require producers and procurers of power to be required to % renewable requirements of overall power utilization via Renewable Portfolio Standards (RPS).
 - Procurers socialize the cost impacts of those new generation sources via long term purchase contracts. These contracts enable the producer to attract both the debts and equity required to construct the renewable energy assets.
- Institutional investors (like state pension funds) as well as public securities investors approve of the risk/reward of assets and portfolios and companies (i.e. YieldCo's) of this type, and so the virtuous cycle continues (as long as new revenue contracts to support new assets also continue).

Utility Model Disruptors

SECTION II

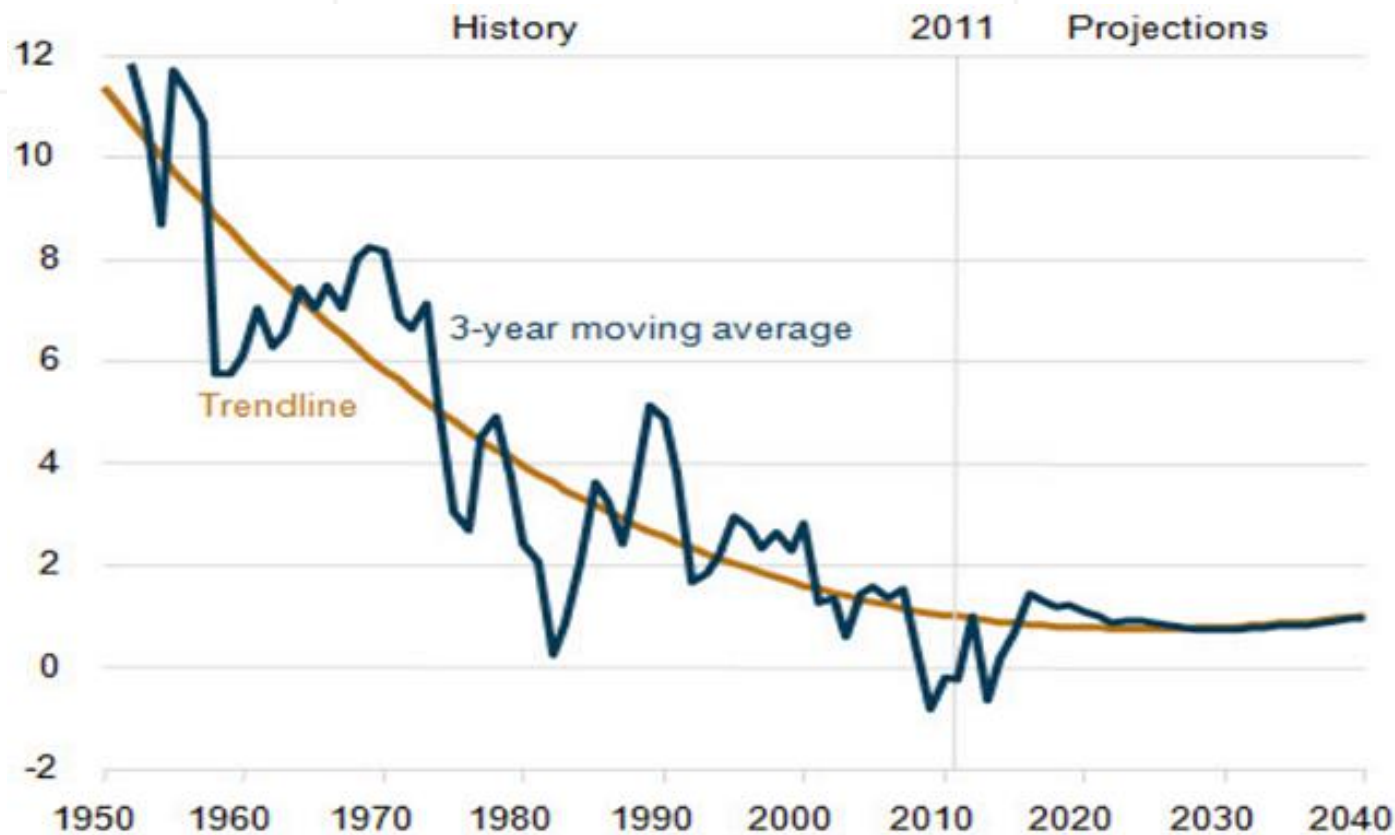
Utility Business Model Disruptors

Disruptors threaten the viability of the traditional utility model

- Utilities are seeing their addressable market shrink due to structural changes, new technologies, substitution and demand-side management
- These disruptors can generally be grouped into two general segments: changes to the utility business model and evolving technologies

Changes to the Utility Business Model: Reduced Customer Demand

Description	Commentary	Impact
<ul style="list-style-type: none"> ▪ Sales growth has been limited or negative for many utilities across customer classes since 2010 ▪ Several utilities projecting continued weakness in demand 	<ul style="list-style-type: none"> ▪ Demand response, energy efficiency, distributed generation, and changes in customer behavior leading to lower demand 	<ul style="list-style-type: none"> ▪ Potential for long-term demand weakness ▪ Customer rates could rise given significant capex programs and lower volumes



Changes to the Utility Business Model: Increased Retail Choice

	Description	Commentary	Impact
Retail Choice	<ul style="list-style-type: none"> Customers switching to alternative retail energy providers in deregulated markets Examples: 	<ul style="list-style-type: none"> Strong growth amidst intense margin competition Retailers expanding into related customer revenue opportunities (energy efficiency, demand response, HVAC, rooftop solar) Reliance on larger balance sheets to support supply (parent, sleeves) 	<ul style="list-style-type: none"> Ongoing trend of customer migration away from the incumbent utility in several competitive markets (ex: ERCOT, PJM) Established retail platforms being used to coordinate and expand demand-side disruptive opportunities with customers

Example:



Changes to the Utility Business Model: Abundant Natural Gas Supply

	Description	Commentary	Impact
Abundant Natural Gas Supply	<ul style="list-style-type: none"> Shale development has created abundant natural gas supply 	<ul style="list-style-type: none"> Oversupply creating low gas and power prices 	<ul style="list-style-type: none"> Natural gas-fired CCGTs likely to meet new thermal generation needs for the foreseeable future New pipeline infrastructure needed to connect supply with load Fuel oil / propane to natural gas conversions



Changes to the Utility Business Model: Evolving State Regulatory Requirements

	Description	Commentary	Impact
Evolving State Regulatory Models	<ul style="list-style-type: none"> Widespread public policy support for sustainability Public policy promotes programs that can be inconsistent the utility revenue model (efficiency, demand response, solar) Heightened awareness of cost increases given economic environment and low interest rates 	<ul style="list-style-type: none"> Revised utility tariff structures being implemented (decoupling, weather normalization, fuel adjustment clauses, time of use rates) Electric ROEs continue to trend lower (11.6% in 2000 10.2% in 2012) Low interest rates likely to continue to pressure ROES 	<ul style="list-style-type: none"> Greater need for participation in regulatory process to ensure favorable outcomes Long-term investments need to be evaluated for risk recovery Status quo strategy not a viable option

Changes to Utility Business Model: Environmental Regulations

	Description	Commentary	Impact
Environmental Regulations	<ul style="list-style-type: none"> Continuing trend of more stringent environmental standards applied to electric generation Can be dynamic and unpredictable State RPS standards 	<ul style="list-style-type: none"> Increasing focus and support on federal government level NAAQS, MATS, CCR, 316(b), GHG Any new proposals likely to meet legal challenges Continued support for renewable generation 	<ul style="list-style-type: none"> Coal retirements Natural gas-fired CCGTs likely to meet new thermal generation needs for the foreseeable future Higher cost of environmental compliance in the future puts pressure on rates

Changes to Utility Business Model: Aging Utility Workforce

	Description	Commentary	Impact
Aging Utility Workforce	<ul style="list-style-type: none"> ▪ Aging and retirements shifting demographics of front line utility employees 	<ul style="list-style-type: none"> ▪ Average age of the workforce now >46 years old according to the Center for Energy Workforce Development ▪ Retirements resulting in loss of critical knowledge and experience 	<ul style="list-style-type: none"> ▪ Creates opportunities for companies that perform outsourcing of utility work ▪ Can develop new training and hiring programs, partnerships with universities



Changes to Utility Business Model: Independent Transmission

	Description	Commentary	Impact
Independent Transmission	<ul style="list-style-type: none">▪ Emergence of independent transmission platforms backed by strategic and financial investors	<ul style="list-style-type: none">▪ Large scale, expensive projects▪ Long lead-times for development▪ Stable cash flow profile leads to strong access to financial markets	<ul style="list-style-type: none">▪ Greater competition for future transmission opportunities, including from out of region participants

Evolving Technologies: Energy Efficiency & Demand Side Management

	Description	Commentary	Impact
Energy Efficiency	<ul style="list-style-type: none"> More efficient technologies leading to reduction in wasted energy 1.1 GW cleared the most recent PJM capacity auction 	<ul style="list-style-type: none"> Increasing regulatory focus, 10 states have mandated efficiency programs Cost of commercial energy efficiency estimated to be cheaper than generation ~\$3 / mmBtu (Westly) 	<ul style="list-style-type: none"> Creates lost revenue exposure Rate decoupling mechanisms likely to become more prevalent
Demand Side Management	<ul style="list-style-type: none"> Delivering significant reductions of peak demand 12.4 GW cleared the most recent PJM capacity auction 	<ul style="list-style-type: none"> Continue to capture marketshare, estimated ~7.5% CAGR in peak load reductions over the last 5 years (EIA) Questions remain regarding reliability and actual performance of resources when called upon 	<ul style="list-style-type: none"> Creates lost revenue exposure Implementation of fixed customer service charges to eliminate cross-subsidies in rates

Evolving Technologies: Distributed Generation & Alternative Vehicles

	Description	Commentary	Impact
Distributed Generation	<ul style="list-style-type: none"> Includes solar rooftop, self-generation, fuel cells Represents <1% of electric generation but growing at a high rate <div style="display: flex; justify-content: space-around; align-items: center;">   </div>	<ul style="list-style-type: none"> Dramatic declines in PV cost making solar more competitive 4.4 GW of solar generation expected to be installed in 2013, growing to nearly 9.2 GW annually in 2016 (SEIA) Significant tax incentives 	<ul style="list-style-type: none"> Technologies aimed at peak periods will displace more traditional generation Regulatory net-metering models need to adapt to avoid cross-subsidies for interconnection and back-up supply Can proactively develop a framework for solar to work within rate making process
Alternative Vehicles	<ul style="list-style-type: none"> High gasoline prices driving demand for alternative fuel sources for vehicles 	<ul style="list-style-type: none"> Natural gas vehicles (NGVs) emerging in fleet vehicle segment Pure-electrics and hybrids increasingly popular with consumers 	<ul style="list-style-type: none"> Long-term benefit from growth in demand for electricity to power vehicles

Utility Model Disruptors: Evolving Technologies

	Description	Commentary	Impact
Electricity Storage	<ul style="list-style-type: none">▪ Battery and other storage technology continues to develop and become more efficient▪ Examples: SolarCity/Tesla, Xtreme Power, Beacon Power and Convergent	<ul style="list-style-type: none">▪ Backup and peak-shaving source of supply▪ Can be applied to alleviate transmission constraints or intermittent generation▪ Long-term: electric vehicle-to-grid storage possible	<ul style="list-style-type: none">▪ Currently expensive to implement▪ Economics make it currently more practical for C&I customers



Implications of Utility Model Disruptors for Energy Finance: Changes in Generation Fleet Composition and Fuel Type Mix

- Ad hoc changes in utility regulatory system are increasing supply and demand volatilities that can lead to procurers of new renewable energy assets being caught in the middle of end-users exerting political will to not have to pay for the cost of interim volatilities while it reaches the desired end-state

For energy finance, this means an increased risk of a financed procurer becoming financially stressed (Polar vortex'd) or facing working capital bankruptcies or equity losses

Implications of Utility Model Disruptors for Energy Finance: Demand Destruction

- Energy consumption has not rebounded with economic growth. Lower energy consumption means higher costs (more renewable generation, more transmission to customers) are spread over fewer units of energy sold therefore a real increase in end-user prices is necessary to keep utilities viable
- Localized generation (i.e. rooftop solar) advocates for “net metering” - payment as needed (for grid support and back-up power when needed). Net metering doesn't provide enough revenue to support the underlying grid level assets.
 - I.e. Roads need maintenance that only tolls can create the money to implement – how do we create harmony on the side roads while keeping the main road in proper conditions?

Implications of Utility Model Disruptors for Energy Finance

- Ratepayers need to be ready to put their money where their mouth and their stated goals are:

If overall revenues are there to achieve these interim and term goals then utilities will maintain their financing, if not, capital markets will recognize this and the money will flow towards surer bets.

Q&A