US Utilities and IPPs
Distribution before Transmission

Equities

Americas
Electric Utilities

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Transmission woes remain out of our latest T&D conference
We held our inaugural T&D wires conference in New York on Monday looking at opportunities emerging across the wires portion of the utility business. We emphasize the best prospects appear to remain on the distribution side of the equation, with not just smart meter opportunities, but wider reinvestment in the distribution network to enable Distributed Energy Resources (DERs) and wider updating of the grid. A national trend identified includes replacement of wooden poles, exhibited by EIX's substantial pole loading replacement program earlier this year.

Why is there less need for transmission? Slower demand + retirements.
Despite continued robust investment in renewables, the combination of slower demand (to which there is a disproportionate compounding effect on the 5- & 10-year plans from ISOs) as well as large-scale retirements (coal and nuclear), we believe there is little near-term need for meaningful addition transmission almost anywhere nationally. Rather, without clarity from Clean Power Plan (CPP), we see transmission investment as largely 'stuck', albeit large projects previously awarded remain under way (such as MISO's MVP projects, which should substantially depress Illinois LMPs). Further, in the ISO-NE case, substantial coastal retirements (Pilgrim and Brayont Point) enable limited upgrades for meaningful offshore wind prospects.

ROEs: Expect More of the Same for Now. recognition for shift needed
The latest word from DC continues to emphasize no change in methodologies despite increasingly bearish datapoints on trends for ROE given the low rate environment. To this point, we expect the determination of 'anomalous' market conditions to persist. We believe a wider peer group could yet emerge as the world of utilities has rapidly consolidated in recent periods. We see potential reform of the current narrow CAPM and DCF approach. Overall, we expect compression on ROEs as the peer group itself compresses principally via acquisition and wider deceleration of growth prospects.

What's our bottom line on Merchant Transmission? Gaining some legs

While we have previously been sceptical on prospects for long-distance and expensive HVDC lines, expanding renewable targets appear to be making it a reality. We believe Clean Line and other peers like PEGI which are developing a project from ERCOT to the Southeast could well accelerate deployment wind in the most economic regions. We see this trend as also applicable even intra-regional (within a single ISO such as ES' efforts within ISO-NE for transmission from Maine) or from NYISO to ISO-NE.

What is struggling? FERC 1000 and Competitive Transcos
Despite opening to some fanfare a few years ago, we note very few projects. Even for those awarded, litigation costs could have exceeded any efficiencies. We expect few awarded projects in SPP or MISO. Further we don't expect an expansion of ERCOT's CREZ efforts. Rather, CAISO remains the principle angle. With renewable integration largely responsible by generators, the question is largely partnering with generators for small interties. To this point, interconnect costs continue to trend higher.

What about large-scale opportunities? MISO says 2019
As part of a substantial update from MISO' CEO John Bear, the next major update on transmission remains pushed out to 2019 given limited demand plus some visibility on retirements and Clean Power Plan (CPP) implementation. Notably, on the point of Michigan deal signed, we see a potential for exports into MISO *from* PJM to address retail needs. Adding in the transparency of three –year forward capacity procurement in MISO and this could help retail competitors remain in place. Details on MISO capacity auction structure could well augur well for future prices being close or at a premium to PJM. Filing is due in early November.

Who was the 'Star' of the Show? AEP

AEP's transmission efforts are indeed differentiated from peers in several ways

We emphasize AEP into their 11/1 Analyst Day given their continued confidence across a wide range of investment opportunities for their transmission business. We see AEP as among the few companies seeing disproportionate growth from their Transmission efforts driven largely outside of the traditional ISO planning processes. Upgrades are principally oriented on smaller kV systems, adding looping and other reinforcements to traditionally radial grids to serve their substantial Muni & Coop businesses (they own the T service for many distribution-only rural utilities). Further, mgmt. noted their disproportionate opportunities to ratebase wind growth in Texas via their two regional utilities. We note ERCOT allows utilities to ratebase the bulk of the spend in contrast to other RTOs, enabling substantial opportunities for AEP as wind shifts away from the Western regions towards the more Southern portions of the state in AEP's territory. Lastly, basic upgrades to AEP's core Ohio business remains a clear focus as small-scale investments do not require full PJM RTEP review.

We reiterate our Buy rating, emphasizing some investors could have failed to appreciate their above average 7% ratebase growth provided in 2015 EEI slides. Overall, we emerge more confident of an expedited use of proceeds from Genco sales back into the core businesses. We expect the 11/1 Analyst Day could well exceed Street expectations, beating out peer updates from FE and SO in the same period.

Where else did we hear positives?

Expanding renewable mandates appear to continue to drive better transmission prospects across not just CAISO (where several competitive processes have been awarded) but also across New York and New England. While it is detabale whether the structure pursed by NY will succeed in procurement, we see NYISO organizationally as geared to accelerate approval and get even long-distance projects done. We wouldn't doubt NY has Canadian Hydro back on the menu as possible solutions. While partially paid by generators via interconnection costs, this is part of the broader opportunity set.

Focus is on improving distribution grids to improve metrics

We see the focus back on distribution as also fed from a more tangible need to show improving reliability metrics to regulators. While inflationary metrics from higher transmission trends have garnered the attention of regulators, the payoff is less tangible. While initially appealing because ratebase is socialized across the region we believe this appears to be much less palatable of late.

Giving more incentives for distribution recovery

In contrast to efforts from FERC to dis-incentivize incentives of late, we note several utilities such as PA have created new capital recovery mechanisms that have accelerated local distribution spend. We see this as only contributing to this sense of distribution over transmission.

FERC Reform: Where do we stand on Authorized ROEs and Order 1000?

We hosted Evan Reese, Partner at Day Pitney who represents a diverse group of Energy and Utility clients around the nation. Evan stressed that FERC is trying to open up a market that provides transmission solutions and there will be opportunities to compete for assets regardless of the size. FERC completed a 2 day technical conference on where we stand where several RTOs suggested the need for merchant assets. Our panelist believes there are several merchant lines out there that could make sense.

ROE Determinations

We're still at a difficult stage of ROE determinations

The speaker made it clear we're still at a difficult stage of ROE determinations at the moment, and the industry needs a mechanism to address what the appropriate ROE should be. We see transmission projects that IOUs endeavour on calling for higher risk, and thus need recognition for them to get something greater than the typically 9%. Evan stressed that part of what FERC is looking at is where we are on the "incentive opportunity", but status quo will continue to prevail in the near to intermediate term.

Perspective from RTOs on Transmission

MISO's John Bear – CEO Regional & National Regional Transmission Planning Trends discussed with us Multi-Value Projects (MVPs) and reasons for slow-down in transmission spend. John noted there are a lot of renewables coming with lots of congestion into the system. If you step forward to where we're going there are three scenarios. 1) Existing fleet as it is. There are a retirements coming and plants that are aging as well as a lot more renewables in the system. John stated that they're moving towards 25-27GW of wind by 2022 and will need transmission systems for everything. 2) Policy regulations; primarily a 25% reduction across carbon 3) Accelerated alternative technology. We note that the effects of these three different scenarios are similar to that of the Clean Power Plan.

<u>What are the opportunities?</u>

- *North-South integration:* We continue to perceive opportunities to enhance the existing 1GW of interconnectivity. Plans remain unclear. A new cost allocation for transmission could yet emerge as well
- *2019 procurement is the next datapoint:* Focus for the next wave of large procurements remains several years out consistent with other RTOs. Expect near-term focus to be on very small incremental projects.

MISO exports to PJM

MISO is working quite well with PJM on issues, but transmission between the two will be difficult

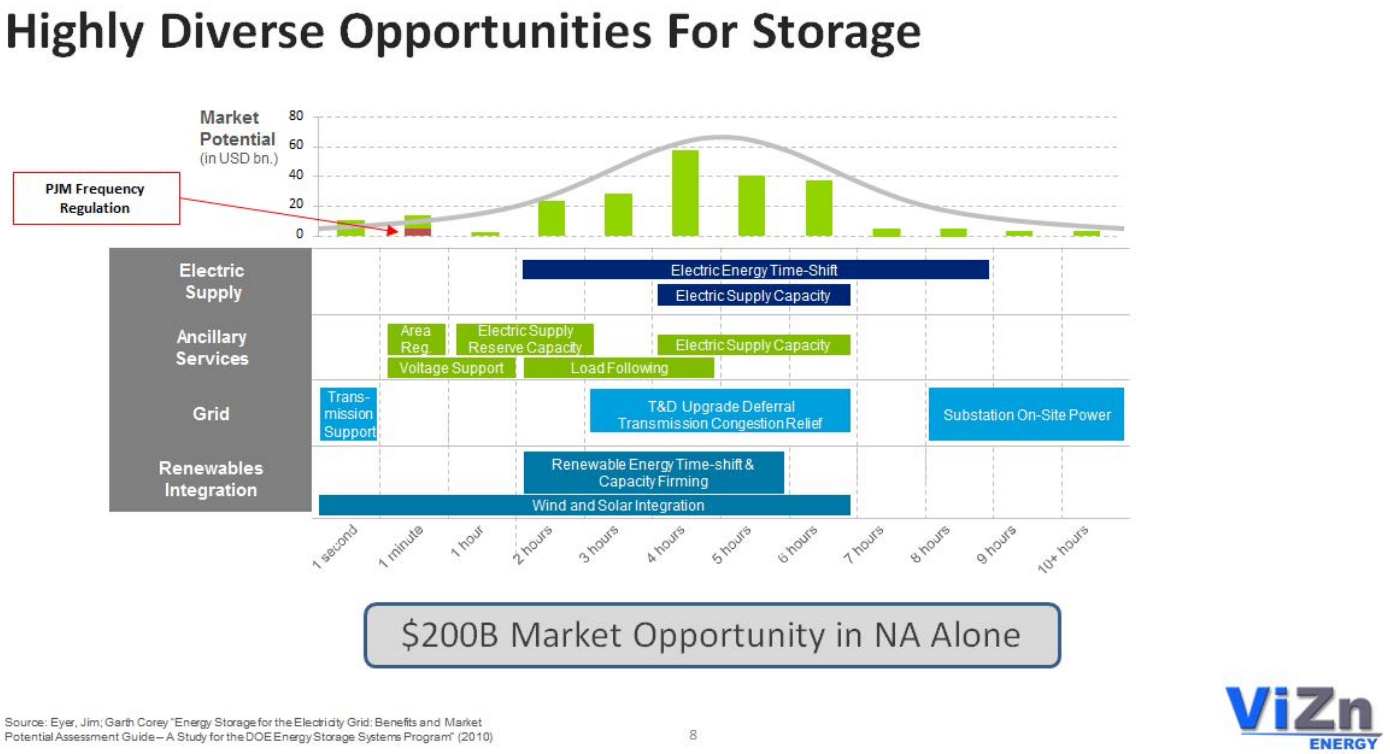
John indicated MISO is working quite well with PJM on issues, but transmission between the two will be difficult. We note that in mid-August MISO filed revised Tariff language to allow it to recover costs for MVPs that benefit PJM customers. In July, FERC cited they were persuaded by the large-scale wind build out which could serve both MISO's and its neighbouring entities energy requirements. MISO highlighted that there is tremendous benefit in transmission from north (gas) to south (wind), but they're still working out the details. That said, we note our panelists comments at our conference indicates to us that there is a higher probability of them doing more transmission with SPP. <u>Bottom Line: *Under CP we could yet see some exports into PJM decline.*</u>

Storage Opportunity Integration into T&D Planning

We hosted management from ViZn Energy Systems, the largest flow battery solution and developer, who discussed the concept of T&D deferral via storage and the opportunities it presents as an alternative to substation and transmission upgrades. The company's energy storage solutions allow utilities to defer investments in transmission and distribution, by minimizing excess capacity on these lines principally tied to renewables. The company's utilizes 3-4 hour batteries, which it asserts are very competitive versus lithium ion batteries (20 year life versus 7 for lithium ion ones). Ultimately, management believes the energy storage business related to transmission represents a $200 billion market opportunity in North America alone (and $700 billion worldwide).

ViZn mgmt. believes energy storage business related to transmission represents a $200 billion market opportunity in North America alone

Figure 1: ViZn Energy Outlines the Opportunity for Storage



Source: ViZn Energy Systems Mgmt Presentation

Energy storage solutions are under consideration by various players. For instance, management noted that Consolidated Edison is looking to avoid $1 billion in transmission and distribution upgrades through storage solutions. Management also mentioned its ongoing communications with IPP's and deregulated utilities.

Tax Benefits when built with Solar

The tax benefits of energy storage were also discussed. Storage that co-locates with solar qualifies for the 30% investment tax credit. Also, related assets can be depreciated using 5-year MACRS. Between the ITC and MACRS, management noted that the majority of capital invested in storage solutions can be recovered within the first five years.

The benefits instilled from the tax benefits for storage appear to make it all the more economic, effectively pushing deployment of solar in Texas where it might not otherwise be deployed in the C&I context.

Shipping Details

ViZn management anticipates shipping 20-40 MWs this year, 80-100 MWs next year, and 150-200 MWs the year after. Approximately 60% of management's estimate relates to the U.S., with the remainder in Europe. Management noted that plans in Europe for the manufacturing of the largest global flow battery project are forthcoming, and will serve multiple value streams (power, energy, and transmission). Management concluded its remarks by noting the increasing importance of the integration of renewable energy and storage.

The EPC Perspective

We think the panelists and utilities agreed that there are large transmission opportunities in the market, but the flow of projects could be restrained

We also hosted a panel of electric transmission and distribution EPC contractors. Various panelists and presenters believe that reliability is giving way to renewables as the main driver of transmission over the next several years. In general, we think the panelists and utilities agreed that there are large transmission opportunities in the market, but the flow of projects could be restrained. Speakers think that transmission investment will continue to have its challenges in terms of approvals, siting, and incentives. In the meantime, the more steady opportunities may come in the distribution market. One company noted that the training and equipment needed for transmission work are very different from distribution, and that increased competition in a less active transmission market would lead to pricing concessions.

EPC panelists also do not expect to see significant growth in a full EPC model for transmission and distribution

Our EPC panel noted a broader trend of outsourcing, but some utilities cited potential to achieve efficiencies by maintaining some engineering and construction capabilities in-house. EPC panelists also do not expect to see significant growth in a full EPC model for transmission and distribution, as customers have typically maintained separate, and mutually exclusive, bids for engineering and construction work. Safety remains a very important factor for customers' selection of contractors.

Renewable Implications

We hosted Cypress Creek Renewables Director Noah Hyte who leads new market development renewable integration for utility scale and DG projects.

Our panelist cited the challenges within utilities distribution systems mentioning the cost of going to specific sub states in proportion to the size of projects sometimes being uneconomical. The good: Looking for projects that don't require robust upgrades for substations. The ugly is what happens in cases of high penetration or cost sharing.

Figure 2: Stratifaction of Projects

STRATIFICATION OF PROJECTS BY INTERCONNECT SCOPE

Distributed Scale	Time and Scope	Cost ($/Wdc)
The Good	3 - 6 Months; interconnecting facilities, no line upgrades	$0.02 - $0.07
The Bad	9-12 Months; re-conductoring or direct transfer trip	$0.10 - $0.15
The Ugly	≥ 18 Months: substation upgrades and direct transfer trip	≥ $0.20

Utility Scale	Time and Scope	Cost ($/Wdc)
The Good	6 - 12 Months; interconnecting facilities, low to no line upgrades	$0.01 - $0.04
The Bad	12-24 Months; substation upgrades	$0.05 - $0.15
The Ugly	≥ 24 Months: new substation construction, line re-conductoring, or new circuits	≥ $0.20

CYPRESS CREEK RENEWABLES

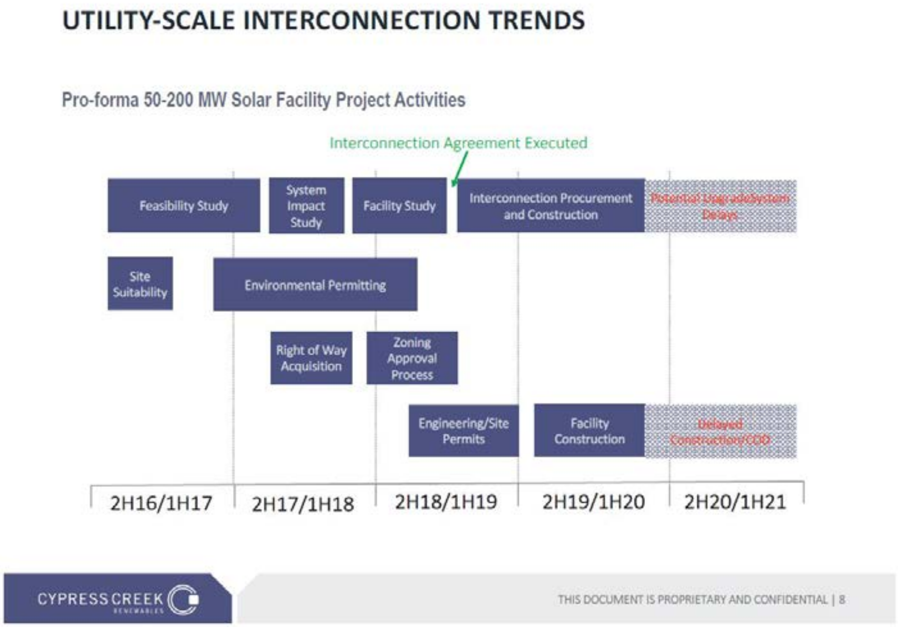
Source: Cypress Creek Slides

Interconnection associated ITC and PTC Risk

Total non-interconnect solar system costs continue to decline in conjunction with increasing penetration of renewables. Additionally, our panelist mentioned that the influx of projects seeking interconnection has resulted in a strain on RTO/ISOs that do not have clustered studies, resulting in greater uncertaintly in interconnection upgrade cost, scope and curtailment.

Our panelist stressed interconnect cost will continue to represent a growing proportion of overall system costs. ITC execution risk also increases as the interconnection and upgrade costs and scope grow. PTC qualification risk will grow as the interconnection upgrade scope becomes more complex and dependent upon multiple stakeholders, in our panelist view. Additionally, the panelist sees the potential for curtailment in high wind generation areas as he notes additional risk for modelled PTC revenue. Thresholds from large utilities are also creating a barrier for some interconnection. The panelist noted an IOU who changes their technical standards to hinder specific panels from being active on the grid. Figure 3 below highlights where the interconnection agreement is executed and where the potential for system delays can can be.

Figure 3: Utility-Scale Interconnection Trends



Source: Cypress Creek Slides

Figure 4: Trends on Interconnection Costs: The Real Inflation Factor

Massachusetts DOER: DG Future Installed Cost Projection ($/kW, nominal)

System Component	Cost Trend	2013	2014	2015	2016	2017	2018	2019	2020
Non-interconnection	-11%	3.19	2.82	2.5	2.21	1.96	1.74	1.54	1.36
Interconnection	5%	0.13	0.14	0.15	0.15	0.16	0.17	0.18	0.19
Interconnect as % of System Cost		**4%**	**5%**	**6%**	**6%**	**8%**	**9%**	**10%**	**12%**

Source: Cypress Creek Slides

Community Aggregations An Opportunity?

Our panelist noted that they have been very aggressive in NY building out a community DG platform. We would note that multiple states are going after the community model and while this is an opportunity for solar installations, to build transmission purely for solar may not make sense. To learn more community choice programs see our recent note here.

Clean Line Energy: Connecting Low Cost Renewables to Demand

Clean Line Energy (CLE), whose sponsors include Och-Ziff, National Grid and Bluescape Energy Partners, focus on building long distance high-voltage direct current (HVDC) that connect regions with abundant, low-cost renewable sources of energy (e.g. Texas and Kansas) to markets where demand for clean energy is strong, but costs are less favorable, (e.g. California and Arizona) and the East (e.g. PJM). The company's notable current projects include:

- **Plains and Eastern Clean Line which will transport ~4.5 GW from the Northern Texas Panhandle to the Tennessee Valley Authority**. Subject to obtaining necessary regulatory approvals, CLE intends to begin construction by the end 2017 with a COD in 2020. This project is principally intended to contract Wind from the cheapest regions of the country and deliver them at an all-in rate equal to that of solar in the Southeast (~$45/MWh). We emphasize solar trends appear to be below these costs, but we believe the appeal of the project is tied to the diversity of dispatch and non-correlation with other regional renewables (principally solar)
  - **SO has cited greater interest in wind on its latest updates.** We see this interest as coinciding with the renewable opportunities articulated by Clean Line into the region. We note Clean Line has also indicated a desire to monetize its line to any eventual utility offtakers as well.
- **Grain Belt Express, a 780-mile transmission line that will transport ~4 GW** from western Kansas to Missouri and Illinois. CLE received approval in Illinois, Kansas, and Arkansas, but has not yet received regulatory approval in Missouri. This project focuses on exporting renewables into the PJM market, which then qualify for a variety of East Coast REC markets. This would be more of a 'push' project.

We note CLE has been focusing on wind generation rather than solar, citing the ability to produce larger volumes with wind. CLE also highlighted that direct competition has been low given the high barriers of entry and significant lead time to build the projects.

Valuation Method and Risk Statement

Risks for the electric utility sector include: fair and reasonable regulatory treatment with respect to capital spending recovery; fuel and purchased power procurement; and operating the generation, distribution, and transmission facilities safely and reliably, especially the nuclear facilities. Public policy mandates such as environmental spend could affect the timing and regulatory recovery. The companies require access to the capital markets and changes in the regulatory compact, or other issues, could impact the ability to raise capital at fair rates. Credit rating agency actions can also affect electric utilities. State regulatory commissions are not bound by prior commission decisions and can alter existing regulatory agreements provided there is a reasonable basis for doing so. Some state commissions are elected, adding another element of risk. Weather, customer growth, and mix also play a key in determining the earnings and cash flow of an electric utility.

Valuation methodologies are: Sum-of-the-parts for companies with competitive integrated utilities and integrated power producers (IPPs); and forward-P/E basis for regulated utilities.

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Source: UBS. Rating allocations are as of 30 June 2016.
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Company Disclosures

Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
American Electric Power, Inc.[5, 6, 7, 16]	AEP.N	Buy	N/A	US$65.01	20 Sep 2016

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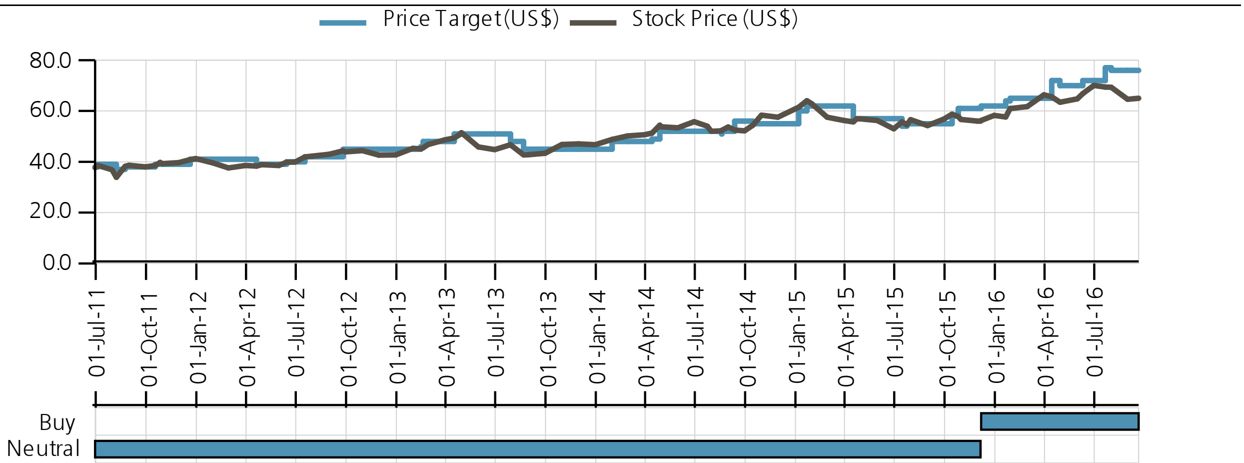

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