UBS

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US Power, Utilities, & Renewables

The Competitive Landscape

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Opportunities in the New landscape

- **We see utilities as still reasonably well positioned**
  - Boston conference datapoints = largely constructive
  - Distribution focus is succeeding in most regions
    - Focus is on improving grid reliability… despite lack of new supply
    - AMI is the real 'new' focus along with smart grid.. Expect more to come?
  - Wind deployments are accelerating.. How do we justify new supply without demand growth?
    - Revisions remain negative, pointing to more flattish prospect.. But who cares?
- **Power: Still in the Doldrums**
  - We see continued pressures at least through 1H with weak prints
  - Can gas prices improve with increasing production? Seeing a concern in West Texas
  - Weak consumption limits translation back to East off weak 1H16 comps
  - Retirements could be the silver lining to prospects
- **Renewables**
  - YieldCos becoming more mainstream.. Still positive on strategic actions
  - Solar companies themselves remain challenged because of increasing competition and lack of re-acceleration back in the US.
  - Wind developer plays remain among the most constructive dynamics across whole sector

Renewables: Wind Quite Intact

We're Really Not Concerned Here

- C&I: Lots of bilateral deals being struck
  - The bulk of the backlog for EDPR, AGR, etc
  - This is outside of traditional Utility procurement
- PPAs from Utilities: Pushing the Utility Ownership model
  - This is the key focus for the likes of NEE and others
  - How much can they share and will Build and Transfer become a bigger piece?
- Repowering Datapoints coming in Strong from GE & others
  - Waiting to see where the trend is in implementation
  - Lots of different configurations on how to do this
  - Could benefit the YieldCo sector too…

Renewables: Solar Prospects Still Slowing

Could we still see a slip into 2018 off 2017? Quite Possibly

- We could see Utility-scale projects continue to slip as 2017 still benefits from the 2016 halo benefits
- Solar on Utility-Scale = PPAs have dwindled
  - Lot more focus on Utility-scale ownership model
  - Very competitive landscape because of limited barriers to entry
- Upside surprise is PURPA
  - Focus on how these are implemented on a state level basis
- C&I Prospects = This really would be the secret sauce to success
  - Have seen this hold up the wider wind market
- Global Demand = Always Exceeding Expectations
  - China is the real reason.. Offsetting global trend as they accelerate meaningfully beyond their 5-year targets (110GWs)

Slowing Demand Growth

- **This has been at the center of recent concerns**
  - We note ISO's are revising down their loads
- **Metered demand is growing even slower**
  - Netting out resi solar growth has been a further focus
  - New England, New York, and PJM
- **Utility Projections in IRPs**
  - At risk before commissions
  - Little to negative growth appears to drive limited incremental generation
  - Expect negative updates to overall supply procurement plans
- **Offset in part by renewables procurement activity**
  - To what extent can utilities accelerate to meet RPS targets or otherwise improve cost structure relative to coal plants?
- **Gas development could meaningfully slow off current levels to a trickle**
  - The future is about <u>peaking capacity</u> rather than energy
  - We view CTs and Internal Combustion Engines as more competitive
  - Larger CCGT units are less attractive

What's all the Talk? **Nuclear.**

Many investors are focused on prospects for these subsidies to play out

- Many are focused on arguing the economics
  - Are plants in NJ and OH really cash flow negative? Marginally, if including all allocated costs
  - Doesn’t matter because FES has real cash flow problems soon… what will happen?
  - Jobs are the focus rather than carbon at this point, to be clear
  - Removal of CPP actually was impediment in Illinois passage
- Just how pervasive? Restructured markets will all see an effort
  - PA is <u>next</u> after efforts in CT and OH this year
  - NJ is clearly a potential in 2018 as well
- FERC level focus with technical conference
  - Multiple directions this could lead

Corporate Tax Reform

How it's done matters a lot to Utilities and Renewables Alike…

- Waning Expectations across the Utilities Sector
  - Still remains a key piece of concern
  - Will Border Adjustability Happen and Interest Deductibility?
- Recall that Lower Corporate Taxes = Hurts Most Utilities
  - Only parent expense isn't recoverable
  - Widens the gap of unrecoverable parent expenses
  - Benefits passed through to consumers.. How much benefit and how recovered exactly?
- Tax Equity availability
  - Not just tied to US corporate tax rates but financial sector health overall
  - Will we see expanding eligible set of funders
  - EDPR points to improving tax equity availability

Distribution Capex: *Can it Just Keep Coming?* AVA & WA

- **Is there an end of the road on distribution capital spending?**
  - Can utilities continue to spend on distribution or to what extent do they need an explicit mandate?
- **Rate inflation limitations highlighted as well**
  - Without real sales growth, much of this is reflected in the form of consumer inflation
  - De-facto industry assumption is to see no more than CPI
- **Rate case fatigue as well?**
  - With 9 consecutive cases having been executed, is there a limit to Staff and Commission acceptance?
- **Attrition rates… what are the limits on forward looking elements?**
  - How much is legally defendable?
  - Define what are known and knowable future adjustments…

Transmission: FERC Tells Cautionary Tale

- **Many investors continue to appreciate FERC risk profile**
  - Opportunity to benefit from CWIP and stable earnings (can consistently earn this ROE for most)
- **Returns on Equity have come down**
  - Predictability in determining ROE is actually appreciated
  - … Even if it doesn't make logical 'sense' in how the formula has evolved through process
  - Lower Growth in Utilities = Lower ROEs for transmission
  - *No limitation to 206 Complaint filings… Will we just see more until dividend yields top out?*
- **But what about FERC 1000? This is too complicated and costly**
  - Attempt to apply incentives has failed to a large extent
  - Too expensive for limited payoff in terms of aggregate projects
  - Few utilities want to see their projects up for bids… maintain opportunity themselves
- **Have seen over-build of transmission**
  - Negative demand growth assumptions have compounding effect through 5- and 10-year planning
  - **Using 'up' this latitude with new wind growth… hence disconnect between wind + transmission…Offsets concerns on saturation of wind build.**

Smart Meters: AMI Deployment Going National

- **This is clearly the new trend among utilities? FOCUS IS ON RELIABILITY OF THE GRID.**
  - Focus on smaller scale opportunities for distribution spend as Transmission slows down
  - This is a readily deployable program on the timeframe for utilities to backstop slowing spend elsewhere
  - Last time we saw this kind of a step-up in spend was with the out of the 2009-era ARRA funding
  - **50% deployed nationally … and counting.**
- **What is the focus? SAIDI and CAIDI Statistics**
  - Improving *Reliability* stats is a clear focus for utilities on delivering <u>improving</u> value to customers
  - Much of the image of utilities tied to just how perceived in reliability
- **Why do it?**
  - Mostly around limiting metering reading
- **Where is deployment spread? Far and wide**
  - We see deployment trending both in urban areas as well as rural areas
  - More costly in rural areas, but prevents costly truck rolls to more distant areas
  - Point to Point networking doesn't require a consistent cell service message
- **Issue to focus on are customer disconnects**
  - Makes it easier to customers to be disconnected.. This has been a trend in California between higher bills and smart meters

Smart Grid: Think Communications Overlay

- **Smart Grids are *different than* Smart Meters**
  - Focus is on enabling utilities to know where outages are
  - Can they self-heal once identified
  - Prevents difficulties in finding *outages, physically*
- **This is a parallel process to Smart Meters**
  - Seeing efforts on the grid to upgrade communication infrastructure *alongside* the smart meters
- **Focus here stretches across both T&D**
  - Efforts are to improve information on system metrics and outage duration
  - Not just about finding outages, but maximizing system performance as well

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Cyber Security: Next Frontier of Capex

- **Focus in a new world on the possibilities to defend**
  - Lots that could be done, it's just about where to put an end to it
  - Limited framework and visibility on the capex and operational implementation of such standards
  - How much visibility will commissions get?

- **Physical Security: Just where do you draw the line?**
  - Lots that could be done, it's just about where to put an end to it
  - Not a *new* problem per se given physical exposure always existed on the grid
  - Rather, it's more of a problem now given the *dependence* on this capex spend

- **Hardening to EMP Standards is also a focus**
  - We note recent standards from White House on January 19th

Technology Improvements Are More Pervasive: Gas

- **It's Not Just Renewables…**
  - CCGT cost has come down materially in recent years
  - Largely on account of building bigger machines… who needs 900 MWs
  - Costs are down to $900/kW for greenfield in PJM
    - Even less for ERCOT
- Are we at the top of the CCGT Cycle?
  - We see concern that Greenfield puts a limit to the inflation in CCGT value
  - The question is just how much of a delta in pricing is possible between the $900/kW for undepreciated asset and then $700-800/kW for legacy assets
  - We see the cap as being higher in more costly markets like New England
  - The comp was CCGT before… going back to being a CT
- Are we going to still see more new build?
  - Yes, clearly in PJM…. More coming this year and next year is under way too
  - Stopping the cycle in New England and New York

Clean Energy Moves to States

- **Policies have been and will remain dictated at the state level**
  - States will act to adopt their own new RPS (Maryland for instance & Ohio unfreeze)
  - Other states could follow with their own efforts…
- **Will the Northeast and PJM get their acts together?**
  - Execution in New York will be critical as REC program design will be closely watched
  - Just how high of a price for 20-year REC will be necessary given energy market hedging limitations
  - Mass deferred procurement from 2016… will 2017 be the big year?
  - Are Firm renewables from Canada the 'Alternative' to gas pipeline limitations
- **Will new carbon programs follow?**
  - Will Washington state see through its carbon program… how will this be designed?
  - More Cap and Trade (NJ in post-Christie administration?)
- **Enforcing Clean Power Plan**
  - Expect litigation of any effort to implement more 'efficiency' oriented measure
- **Net Metering**
  - Will we see more of a pushback on these policies? Likely
  - Question is just how fast will it proliferate to new states like Texas and Pennsylvania?

After the Clean Power Plan

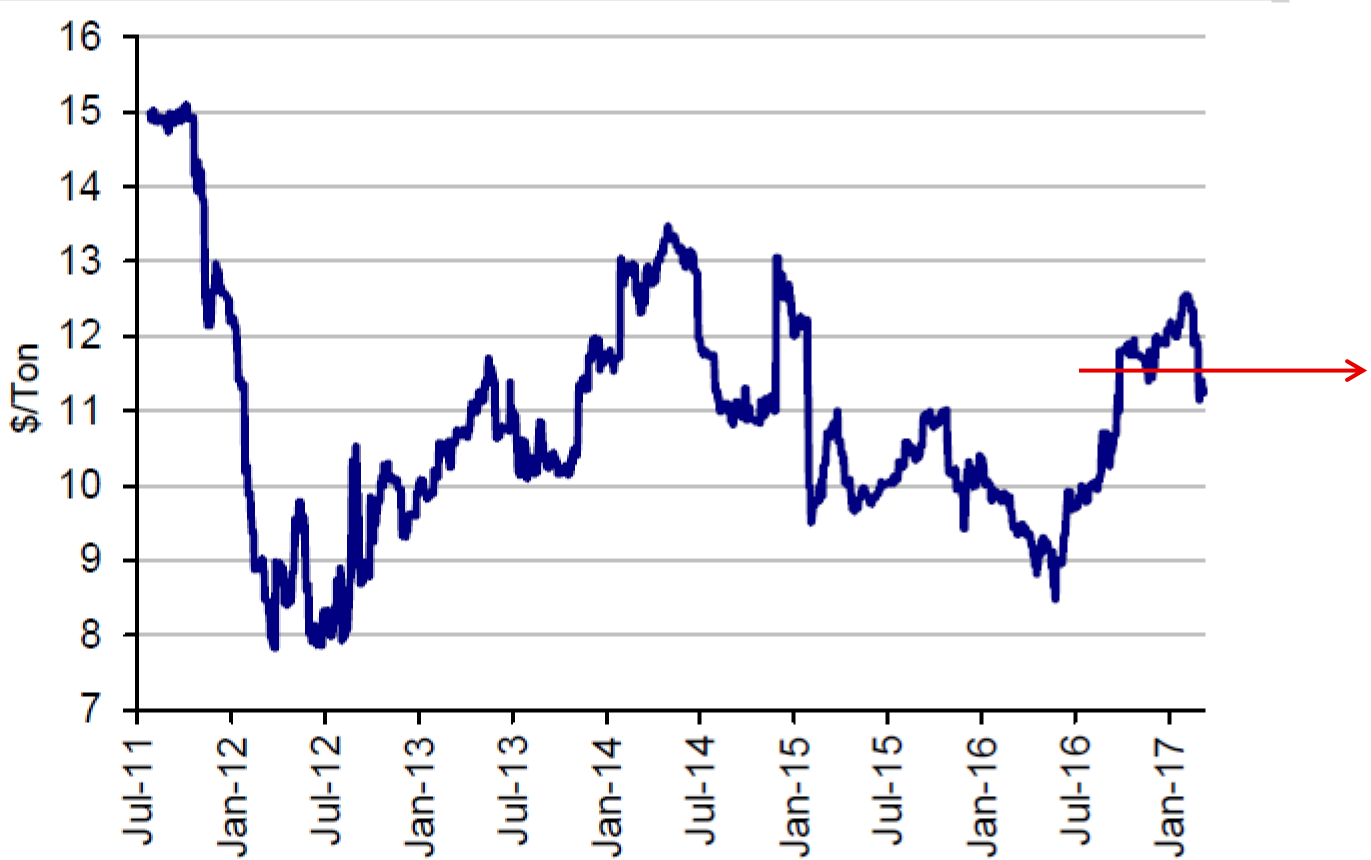
- **CPP = Now What?**
  - Next steps should be articulated soon
- **Watering CPP down could be more palatable**
  - Phase 1 and stop? Energy Efficiency is the focus
  - How do they set this standard for even 'Block 1' of the CPP program could be detrimental to the coal portfolio
  - To what extent will this administration seal the fate of interpreting compliance with the 'Endangerment Finding' to employ a narrow reading of rules?
- **EPA: Focus is on avoiding any deals to retire coal plants**
  - This leaves a greater place for the third-party advocates to negotiate their deals
- **We still see BART in Texas**
  - Multiple avenues arrive at the same outcome in this state
  - Still expecting retirements to materialize given weak economics

Just How Sustainable is the Rally in Coal?

See an argument for robust 1Q , but then what?

- We see pressure on coal returning with risk of retirements in 2H
  - Exactly those plants that are peripheral and driving the rally are most at risk!

PRB Coal prices



Source: FactSet

Expecting Retirements Still… Both PJM & ERCOT

We're Looking for ERCOT related retirements without capacity compensation…

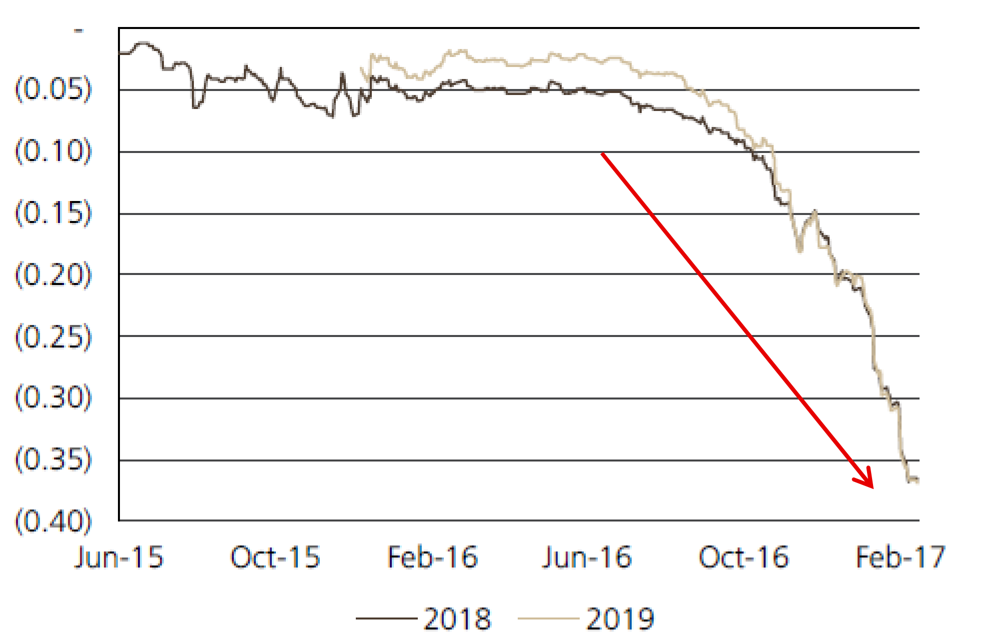
- We note ongoing portfolio rationalization at both VSTE and NRG have been announced.
  - Limited palatability for negative FCF assets
  - Need to do this in the most palatable way to avoid too much pushback from ERCOT, etc
- Uncleared capacity in PJM is still a big focus too
  - 18GW uncleared in the last '19/'20 auction… How much of that is coal + nuclear?

Increase in Gas Production = Concerning

Can West Texas gas impact the ERCOT Market? Possibly.

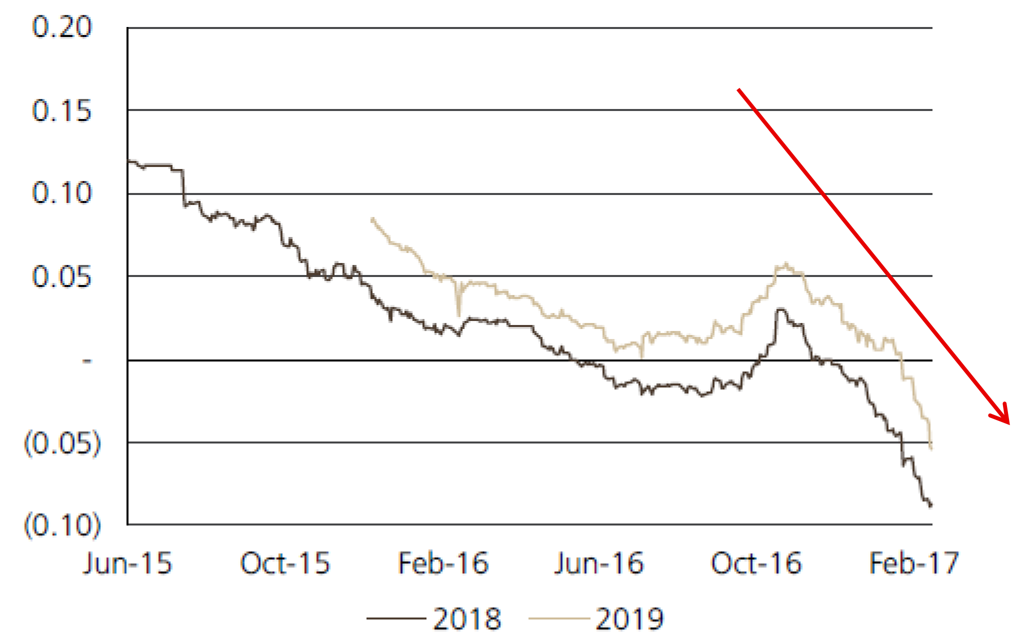
- WAHA = West Texas
- Associated Gas Production with Oil is key to watch.. Will trend up materially.
  - *Watch what happens with the Alpine High production field in particular*

WAHA Hub – Henry Hub basis ($/MMBTU)



Source: Platts

Houston Hub – Henry Hub basis ($/MMBTU)



Source: Platts

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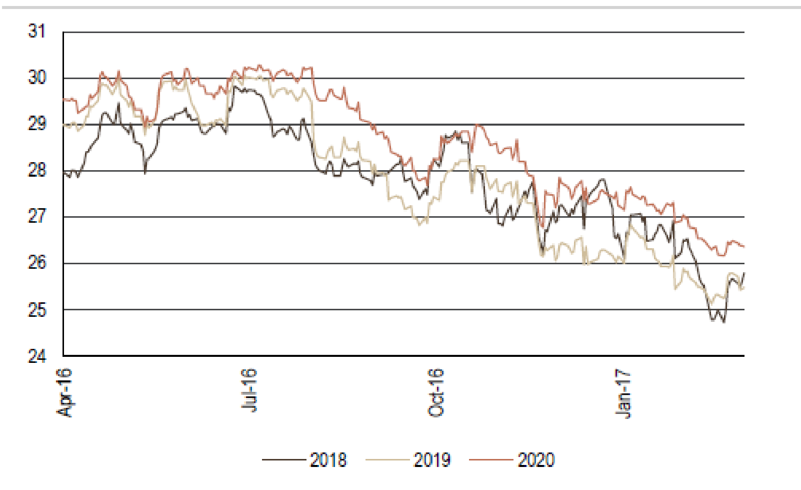
Impact of Cheaper Gas Unclear on Power Prospects

ERCOT Power Prices Haven't Necessarily Reacted

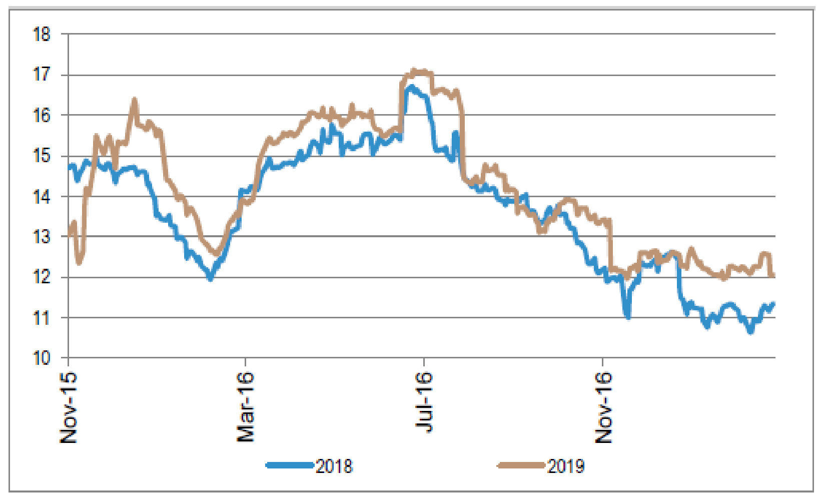
- We see ERCOT prices as under pressure, but not necessarily as much as the basis shift would otherwise suggest?

ERCOT - N ATC Power Prices ($/MWh)



Source: Platts

: ERCOT-N Spark Spreads @ 7.2 HR ($/MWh) – Houston Ship Channel basis



Source: Platts

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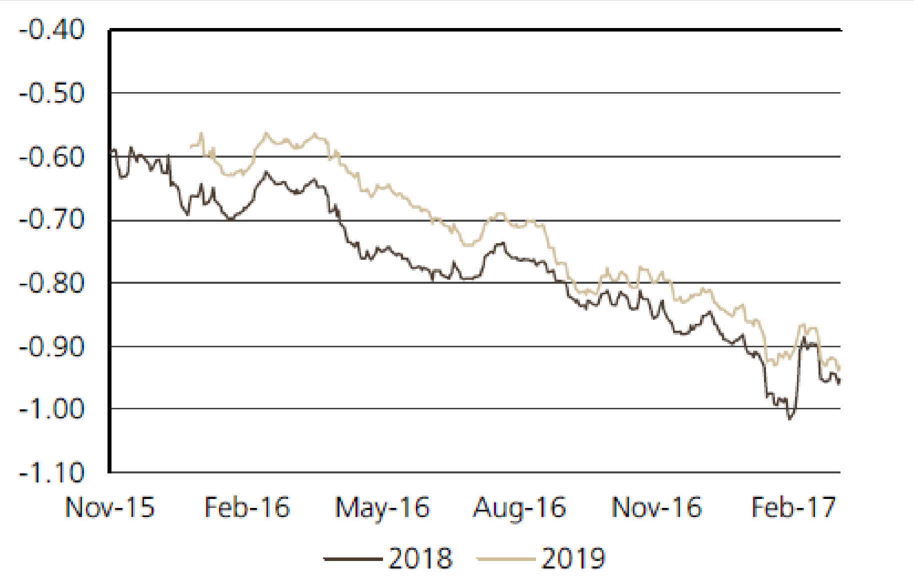
California's Easing Consumption of Gas

We're seeing hydro conditions reduce consumption for now…

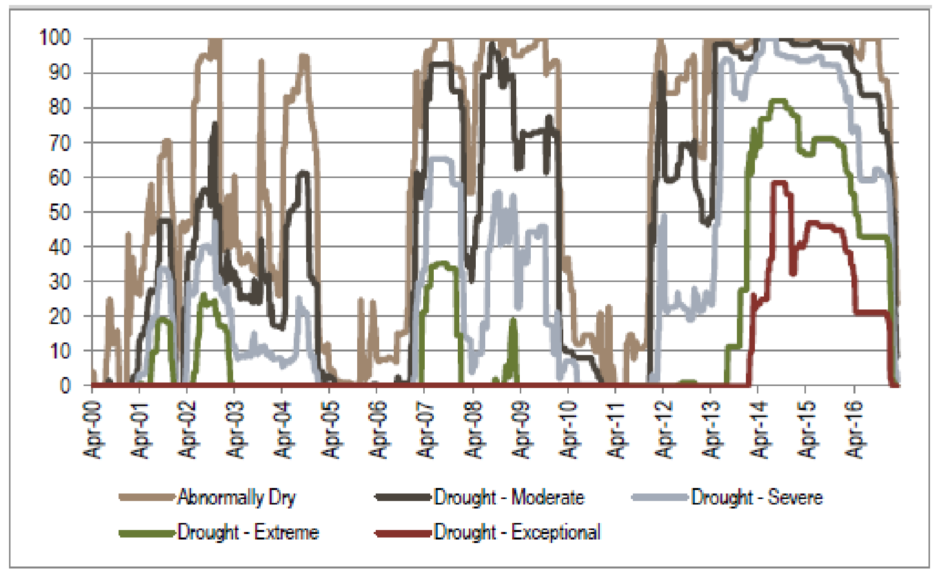
- This is not structural but a <u>cyclical</u> shift away from gas
  – The Drought is over… fast….

SoCal Hub – Henry Hub basis ($/MMBTU)



Source: Platts

CA Drought Monitor



Source: Platts

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Green Tariffs: Another Nascent Trend in Renewables

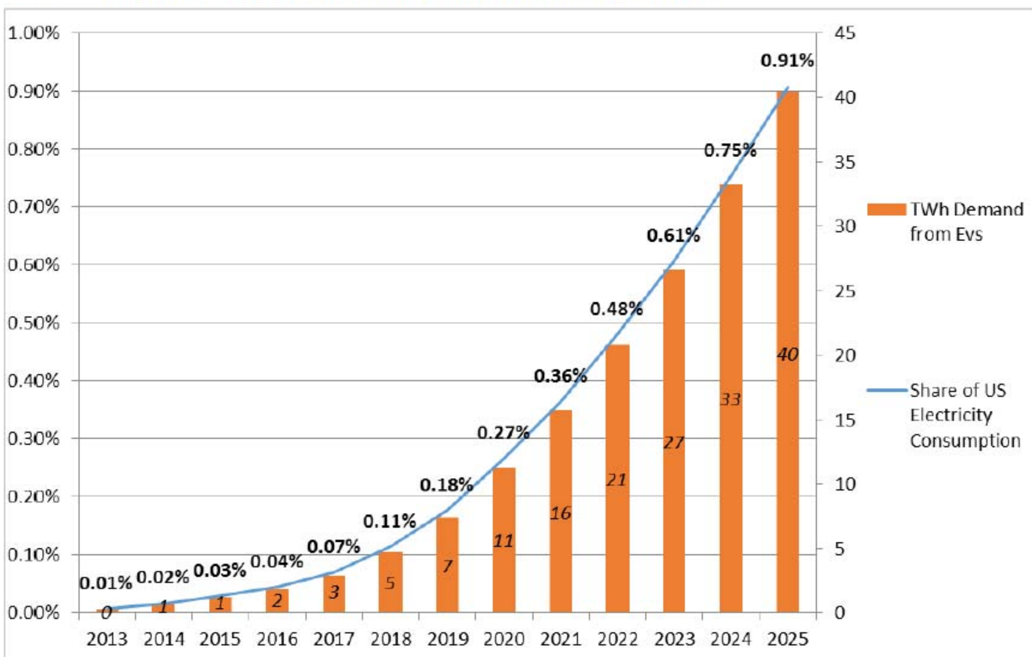
- **What if customers are asking for it 'by name'?**
  - Customers are increasingly asking for options for wind/solar or simply 100% Green Products
- **Cautious example in Nevada with Switch**
  - Has effectively re-opened the conversation on 'Choice' in the state…
  - Direct Access *had been* off the table.. Until now
  - Utility did not offer formal or adhoc tariff
- **What will the tariff be without incurring costs to consumers?**
  - <u>Appealing</u> source of ratebase growth in the sector left without obvious trends
  - Is this ad-hoc or an ongoing tariff… and if a tariff.. How do you ensure no subsidies from rest?
- **Contract duration is the principle issue**
  - How do you ensure offtakers of projects will stick around for ~20-years to amortize the costs?
  - What about credit risks of higher bills… similar to existing utility concerns
- **Examples… See negotiations happening everywhere**
  - Utilities keen to attract and keep these opportunities
  - CMS is negotiating with Switch now to come to Michigan with a green contract… *totally different experience.*
  - Tax considerations are critical… follow the example of Dominion/VEPCO, where are able to structure it as a Utility PPA such that can be competitive vs. PPAs from independents

Electric Vehicles: What are the Prospects?

Demand Growth Will be Slow to Start….

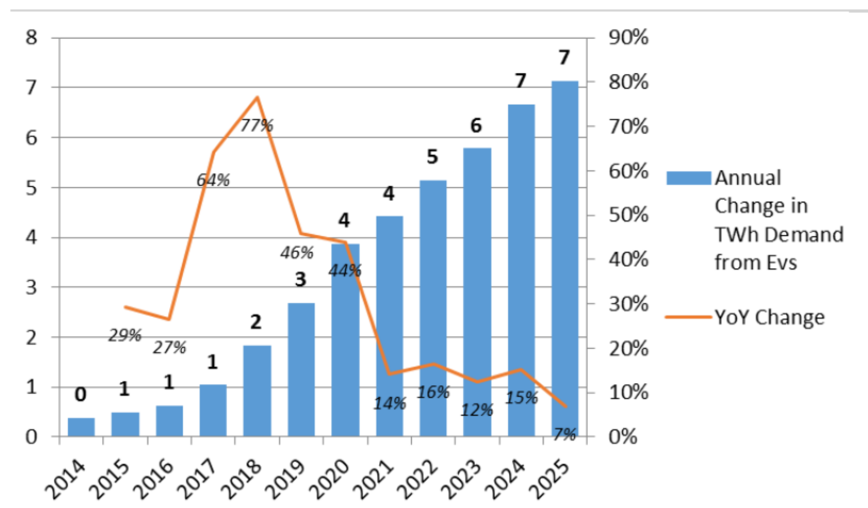
- It's going to be small even in California for a while…. Urban markets remain focus
- PG&E would be **~0.4%/yr** if readily achieve the 1.5 Mn adoption rate across CA by 2025

PEV Share of Total US Electricity Consumption (Cumulative)



Source: Cairn ERA

Annual Change in TWh Demand From EVs and Corresponding YoY % Change



Source: Cairn ERA

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Will Renewables Need the Subsidies?

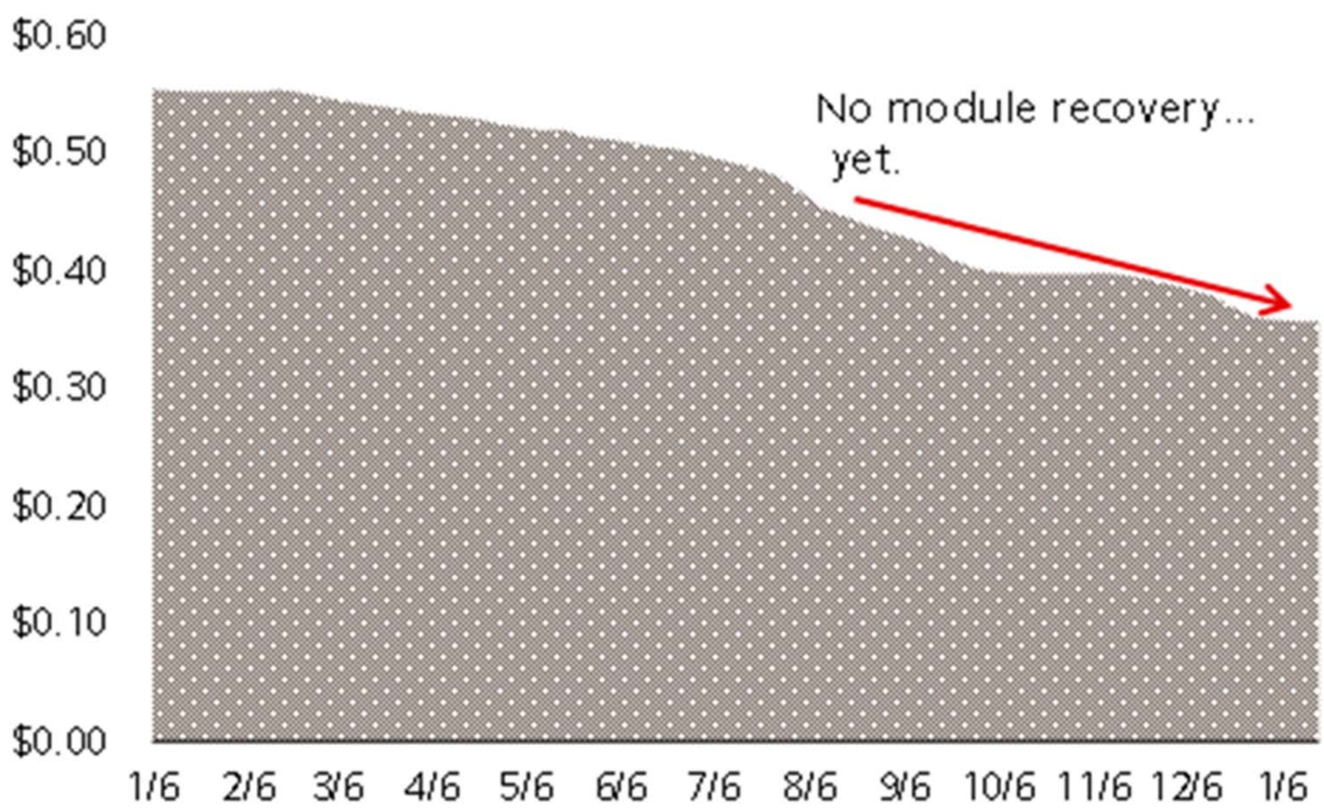
This is really the emerging question in 2020's

- What are deployment prospects without an extension of PTC & ITC?
  - NEE anticipates 2-3c/KWh for wind and 3-4c/KWh for solar
- Cost Declines still materializing
  - Sector could well see a further step-change
- Datapoints on both Modules and BOS are encouraging
  - Panels headed for $0.20's/W… Just a matter of when this becomes widespread
  - We already saw that for 2017 on the lower end of pricing
  - Just how structural is the uptick in Chinese demand?

Modules: Can They Follow The Same Trend?

However, no recovery in module pricing yet

Figure : Aggregate Multi Module Pricing ($/w)



Source: PvInsights

Are Renewables Under Threat? Bottom Line, No.

- **Limited direct impact: <u>Jobs</u> are at stake**
  - ITC/PTC not at real risk
    - But 10% ITC could come out in tax negotiations
  - Wind lobby is strong, with notable Republican leaders (Chuck Grassley)
    - Wind is the newest 'cash crop' in the midwest
  - What's the incentive to pass an early ITC repeal?
- **LCOE = Still Better than Gas on New Build**
  - Most places this remains for much of far West and Midwest (solar & wind respectively)
  - Focus is on capacity backstop increasingly.. What are the limits to penetration? Far off?
- **Unsubsidized Wind at $0.02-0.03, and Solar at $0.03-0.04**
  - Achievable by early 2020 (NEE agrees)
  - Can be <u>below marginal operating/energy cost</u> of existing plants
    - "Steel for fuel"

Summary

What are we saying exactly?

- Renewable Prices Trending Lower
  - Much faster than anyone anticipated… Could still slid hard into 2019
  - Above-expected demand supports pricing for now… at least until mid-2017 tariff cut in China
  - Both modules and Balance of System trending lower
- Utilities able to accelerate growth prospects
  - Distribution: If you haven't announced AMI yet, this presents upside to capex figuers
  - Just how far can they take this theme on Smart grid?
  - Recovery of these investments is key given limited AFUDC accrual potential
- Power
  - Retirements are a focus… just when & where?
  - Nuclear: we think these deals come through.. A bit more cautious for sector overall
  - Without CPP still see some portfolio shift in EPA regs

Valuation Method and Risk Statement

Risks for Utilities and Independent Power Producers (IPPs) primarily relate to volatile commodity prices for power, natural gas, and coal. Risks to IPPs also stem from load variability, and operational risk in running these facilities. Rising coal and, to a certain extent, uranium prices could pressure margins as the fuel hedges roll off Competitive Integrateds. Further, IPPs face declining revenues as in the money power and gas hedges roll off. Other non-regulated risks include weather and for some, foreign currency risk, which again must be diligently accounted in the company's risk management operations. Major external factors, which affect our valuation, are environmental risks. Environmental capex could escalate if stricter emission standards are implemented. We believe a nuclear accident or a change in the Nuclear Regulatory Commission/Environment Protection Agency regulations could have a negative impact on our estimates.

Risks for regulated utilities include the uncertainty around the composition of state regulatory Commissions, adverse regulatory changes, unfavorable weather conditions, variance from normal population growth, and changes in customer mix. Changes in macroeconomic factors will affect customer additions/subtractions and usage patterns.

Solar sector risks include: 1) Solar panel and other input pricing is subject to ongoing price deflation, which affects economics of downstream projects and margins of upstream producers. 2) Government incentives being added or removed have had a disproportionate effect on demand in the past, and may continue to do so. 3) Reliance on power purchase agreements in electricity markets could make future contracts more difficult to sign. 4) Solar power is directly competing with other traditional generators as well as other renewables like wind, which creates uncertainty as wholesale power markets shift. 5) Headline risk and policy risk continue to shift economics in countries as trade policies and changes to other key policies affect solar economics

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Buy	FSR is > 6% above the MRA.	45%	29%
Neutral	FSR is between -6% and 6% of the MRA.	39%	27%
Sell	FSR is > 6% below the MRA.	15%	16%
Short-Term Rating	**Definition**	**Coverage[3]**	**IB Services[4]**
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%

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