

US Power & Utilities

PJM: Yet Another Transition Auction Delay

Equities

Americas
Utilities

FERC pushes out capacity auction in order to include Demand Response

In an order late yesterday, FERC ordered PJM to delay the transition auction in order to allow Demand Response and Energy Efficiency to participate in a 4-1 vote (Clark dissenting; Moeller concurring). The original transition auction had initially excluded both DR and EE products given the uncertainty over the pending Supreme Court case and corresponding uncertainty introduced over its future participation. We see this as a surprise to the market, with FERC only [approving the CP order](#) in mid-June. We expect to get some sense on the latest auction timing later today at PJM's MRC meeting this morning. FERC Order ER15-623.

Fundamentally no change to our estimates despite inclusion of DR, slight neg

We maintain both transition auctions will continue to price with a modest risk premium to the base auctions initially held for the 2016/17 and 2017/18 auctions, at \$119/MW-day and \$120/MW-day respectively, with a range of \$120-130/MW-day likely for both. This would still provide a meaningful uplift for those clearing in the RTO region for the 2016/17 period, where prices cleared at \$59/MW-day. While some investors and industry participants had expected north of \$130/MW-day, we see the latest developments as likely taming price expectations on the margin. Given the seemingly higher cost of complying with CP mandates, we suspect only a portion of DR resources will opt to participate in the transition auction to pick up the limited incremental revenues relative to the risk for a DR and EE participant. We expect PJM equities to see this as a slight negative, not helping the power sector investment thesis following recent retrenchment in the absence of positive catalysts.

Delay could be quite short – but see potential flip in order, with BRA now first

We suspect the latest delay could be quite short (a matter of weeks), with the latest tweak in the transition auction parameters merely a formality. The transition auction could well be rescheduled imminently, with both still potentially held in August. We flag the first transition auction result had been anticipated next Thursday. Given the shift in timing, where the full BRA auction for 2018/19 (posted Friday August 21st) could be held *ahead* of the interim transition auctions for earlier periods; we see this as potentially becoming the 'decisive' volatility event around the impact of the uplift from new Capacity Performance rules.

Julien Dumoulin-Smith

Analyst

julien.dumoulin-smith@ubs.com
+1-212-713 9848

Michael Weinstein

Associate Analyst

michael.weinstein@ubs.com
+1-212-713 3182

Paul Zimbardo

Associate Analyst

paul.zimbardo@ubs.com
+1-212-713 1033

Please see our other recent reports on PJM:

7/17/15 Taking a Load Off at PJM

7/15/15 2Q Playbook: Summer Power Outage

7/14/15 From The Regulators Vantage Point

7/13/15 Seeking 2Q Relief from Summer Doldrums

7/9/15 PJM Capacity Auction Survey: Transition Upside Surprise?

7/2/15 PJM Call: Deciphering Capacity Performance (Includes Transcript)

6/24/15 PJM: What to Expect for the Incremental Auction

6/11/15 Poised to Perform with PJM

5/6/15 PJM: Minding the Base Capacity Auction Print

2/3/15 PJM: Honing in on a Price Estimate

Thinking through Demand Response and Energy Efficiency in the Transition Auctions

We flag just 1.5GW/1.3GW of annual DR & EE cleared in the 2017/18 auction, respectively, with virtually zero annual resources in the '16/'17 period alongside just 1.1GW of energy efficiency. While substantial additional Limited and Summer Extended Demand Response products cleared in each of these auctions, we see the few \$/s/MW-day premium recouped from offering in an annualized product subject to significant penalties for these more limited resources. That said, we suspect there could well be some impact to the auction given the trouble for the DR constituencies to advocate for this outcome; after all, it was the DR industry association, the *Advanced Energy Management Alliance Coalition*, which advocated for the change. Recall, the new Capacity Performance PJM rules are not so onerous as to require instantaneous performance, but rather for units to perform *strictly* within the limitations of their operational characteristics (eg- for DR to perform only when called upon).

Figure 1: Cleared MW for Total RTO, 2016/17 and 2017/18

Cleared MW Total RTO	2016/17	2017/18
Cleared Generation MW	155,634	154,690
Cleared EE MW	1,117	1,339
Cleared DR MW (Annual)	89	1,489
Cleared DR MW (Extended Summer)	2,470	7,163
Cleared DR MW (Limited)	9,850	2,322
Total Cleared MW	169,160	167,004

Source: PJM Interconnection, LLC

How do we think about the risk premium?

Even including Demand Response and Energy Efficiency for the RTO regions, we continue to see the 2016/17 auction as clearing with MAAC, rather than at the lower RTO levels, as the 60% CP requirement still requires some non-RTO capacity to clear the CP auction. Presumably it would only do so at a premium to the price it has already committed in the base auction. Note the table below reflects all cleared MWs, including DR and EE. In the auction parameters that were released on June 24, "the target quantity of Capacity Performance Resources to be procured for the 2016/2017 and 2017/2018 Delivery Years is 95,097 MW and 112,194 MW, respectively." We would still conclude a \$119.13 outcome for 2016/17 (and \$120 for 2017/18).

We would still conclude a \$119.13 outcome for 2016/17 (and \$120 for 2017/18).

Figure 2: Pricing and Earnings Impact Projection for PJM 2016/17 CP Incremental Auction

2016/17 Auction Results (\$/MW-day)	Total RTO	RTO	MAAC	EMAAC	SWMAAC	PSEG	PS-NORTH	DPL-SOUTH	PEPCO	ATSI	ATSI-C
RCP (Annual)		\$ 59.37	\$ 119.13	\$ 119.13	\$ 119.13	\$ 219.00	\$ 219.00	\$ 119.13	\$ 119.13	\$ 114.23	\$ 114.23
RCP (Extended Summer)		\$ 59.37	\$ 119.13	\$ 119.13	\$ 119.13	\$ 219.00	\$ 219.00	\$ 119.13	\$ 119.13	\$ 114.23	\$ 114.23
RCP (Limited)		\$ 59.37	\$ 119.13	\$ 119.13	\$ 119.13	\$ 219.00	\$ 219.00	\$ 119.13	\$ 119.13	\$ 94.45	\$ 94.45
Cleared Generation MW	155,634	75,443	60,886	29,464	10,241	5,656	3,472	1,640	5,346	6,664	2,329
Cleared EE MW	1,117	515	310	51	208	12	3	1	84	197	53
Cleared DR MW (Annual)	89	29	33	21	1	19	0	0	0	9	0
Cleared DR MW (Extended Summer)	2,470	175	1,053	438	426	62	15	7	374	799	103
Cleared DR MW (Limited)	9,850	3,642	4,264	1,547	1,173	550	211	99	290	1,004	365
Total Cleared Annual MW	156,840	75,986	61,229	29,537	10,451	5,686	3,476	1,640	5,430	6,869	2,381
Total Cleared Annual + ES MW	159,310	76,161	62,282	29,974	10,877	5,748	3,491	1,647	5,804	7,668	2,485
Total Cleared MW	169,160	79,803	66,546	31,522	12,050	6,299	3,702	1,746	6,094	8,672	2,850

60% for CP Incremental Auction	95,097
--------------------------------	--------

Capacity by RPM Zone 2016/17 (MW)	Total RTO	RTO	MAAC	EMAAC	SWMAAC	PSEG	PS-NORTH	DPL-SOUTH	PEPCO	ATSI	ATSI-C
DYN	10,735	9,109	1,160	600						466	
AEP	7,923	7,923									
FE	7,440	3,460	135	55						3,845	
FE not cleared (Bruce Mansfield & other)	2,898	350								2,548	
EXC	20,914	7,836	13,078	8,478	1900						
EXC not cleared (Byron, QC, Oyster Ck)	4,306	3,681	0	625							
NRG	15,981	6,033	4,178	972					4,683	1,087	
AES	3,246	3,246	0								

Incremental CP capacity pricing (\$/MW-day)	RTO	MAAC	EMAAC	SWMAAC	PSEG	PS-NORTH	DPL-SOUTH	PEPCO	ATSI	ATSI-C
CP 2016/17 Incremental Auction Outcome (UBSe)	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13
Incremental pricing vs 2016/17 BRA										
DYN	\$ 59.76	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.90	\$ 4.90
AEP	\$ 59.76	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.90	\$ 4.90
FE	\$ 59.76	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.90	\$ 4.90
FE not cleared (Bruce Mansfield & other)	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13
EXC	\$ 59.76	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.90	\$ 4.90
EXC not cleared (Byron, QC, Oyster Ck)	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13	\$ 119.13
NRG	\$ 59.76	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.90	\$ 4.90
AES	\$ 59.76	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4.90	\$ 4.90

Incremental CP revenues at 94.1% EFORD and 90% CP qualified(\$M)	Total RTO	RTO	MAAC	EMAAC	SWMAAC	PSEG	PS-NORTH	DPL-SOUTH	PEPCO	ATSI	ATSI-C
DYN	\$ 169	\$ 168	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1	\$ -
AEP	\$ 146	\$ 146	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FE	\$ 70	\$ 64	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6	\$ -
FE not cleared (Bruce Mansfield & other)	\$ 107	\$ 13	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 94	\$ -
EXC	\$ 145	\$ 145	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXC not cleared (Byron, QC, Oyster Ck)	\$ 159	\$ 136	\$ -	\$ 23	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
NRG	\$ 113	\$ 111	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2	\$ -
AES	\$ 60	\$ 60	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

UBSe			
Comparative Impact (EPS & EBITDA)	Total RTO	2016 Est	% Impact
DYN (EBITDA)	\$ 169	\$ 1,187	14%
AEP	\$ 0.19	\$ 3.56	5%
FE	\$ 0.27	\$ 2.72	10%
EXC	\$ 0.23	\$ 2.38	10%
NRG (EBITDA)	\$ 113	\$ 2,953	4%
AES	\$ 0.05	\$ 1.27	4%

Source: PJM Interconnection, UBS Estimates, FactSet

Figure 3: Pricing and Earnings Impact Projection for PJM 2017/18 CP Incremental Auction

2017/18 Auction Results (\$/MW-day)	Total RTO	RTO	MAAC	EMAAC	SWMAAC	PSEG	PS-NORTH	DPL-SOUTH	PEPCO	ATSI	ATSI-C	COMED	BGE	PPL
RCP (Annual)		\$120.00	\$120.00	\$120.00	\$120.00	\$215.00	\$215.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00
RCP (Extended Summer)		\$120.00	\$120.00	\$120.00	\$120.00	\$215.00	\$215.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$53.98
RCP (Limited)		\$106.02	\$106.02	\$106.02	\$106.02	\$201.02	\$201.02	\$106.02	\$106.02	\$106.02	\$106.02	\$106.02	\$106.02	\$40.00
Cleared Generation MW	154,690	38,999	63,719	30,596	10,146	5,705	3,739	1,595	5,305	7,815	2,223	20,190	2,436	8,627
Cleared EE MW	1,339	0	369	79	228	18	3	1	104	142	36	583	124	36
Cleared DR MW (Annual)	1,489	0	814	165	80	56	24	9	46	111	28	52	34	461
Cleared DR MW (Extended Summer)	7,163	1,125	2,578	874	1,164	155	63	53	473	736	236	1,170	692	183
Cleared DR MW (Limited)	2,322	609	885	497	155	178	65	24	90	173	26	256	65	42
Total Cleared MW	167,004	40,601	68,364	32,211	11,773	6,111	3,893	1,682	6,018	8,977	2,549	22,551	3,351	9,349

70% for CP Incremental Auction 112,194

Capacity by RPM Zone 2017/18 (MW)	Total RTO	RTO	MAAC	EMAAC	SWMAAC	PSEG	PS-NORTH	DPL-SOUTH	PEPCO	ATSI	ATSI-C	COMED	BGE	PPL
DYN	10,735	7,900	1,160	600						466		1,209		
AEP	7,923	7,923												
FE	8,930	4,515	130	55						4,285				
FE not cleared (Bruce Mansfield & other)	2,683	49								2,634				
EXC	20,914	7,836	13,078	8,478	1900									
EXC not cleared (Byron, QC, Oyster Ck)	4,306	3,681	0	625	0									
NRG	15,981	1,727	4,178	972					4,683	1,087		4,306		
AES	3,246	3,246	0											

Incremental CP capacity pricing (\$/MW-day)	RTO	MAAC	EMAAC	SWMAAC	PSEG	PS-NORTH	DPL-SOUTH	PEPCO	ATSI	ATSI-C	COMED	BGE	PPL
CP 2017/18 Incremental Auction Outcome (UBSe)	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00	\$120.00
Incremental pricing vs 2017/18 BRA													
DYN	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
AEP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FE not cleared (Bruce Mansfield & other)	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00
EXC	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXC not cleared (Byron, QC, Oyster Ck)	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00	\$ 120.00
NRG	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
AES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Incremental CP revenues at 94.1% EFORD and 90% CP qualified(\$M)	Total RTO	RTO	MAAC	EMAAC	SWMAAC	PSEG	PS-NORTH	DPL-SOUTH	PEPCO	ATSI	ATSI-C	COMED	BGE	PPL
DYN	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
AEP	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
FE not cleared (Bruce Mansfield & other)	\$ 100	\$ 2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 98	\$ -	\$ -	\$ -	\$ -
EXC	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EXC not cleared (Byron, QC, Oyster Ck)	\$ 160	\$ 137	\$ -	\$ 23	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
NRG	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
AES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

UBSe			
Comparative Impact (EPS & EBITDA)	Total RTO	2017 Est	% Impact
DYN (EBITDA)	\$ -	\$ 1,222	0%
AEP	\$ -	\$ 3.64	0%
FE (Includes Uncleared)	\$ 0.15	\$ 2.23	7%
EXC (Includes Uncleared)	\$ 0.12	\$ 2.52	5%
NRG	\$ -	\$ 1.36	0%
AES	\$ -	\$ 1.40	0%

Source: PJM Interconnection, UBS Estimates, FactSet

How do investors in our survey think about the premium?

From 7/9/15 PJM Capacity Auction Survey: Transition Upside Surprise?

PJM survey shows industry execs more bullish than investors for a change

We conducted our latest annual PJM capacity auction survey directed at utility investors and industry participants separately. Given the inaugural implementation of FERC's recently approved Capacity Performance (CP) rules the upcoming auction outcome appears even more opaque than usual. In contrast to previous surveys industry participants were more optimistic on auction prospects than investors for the base auction for the 2018/19 period but most notably for the transition auctions for 2016/17 and 2017/18.

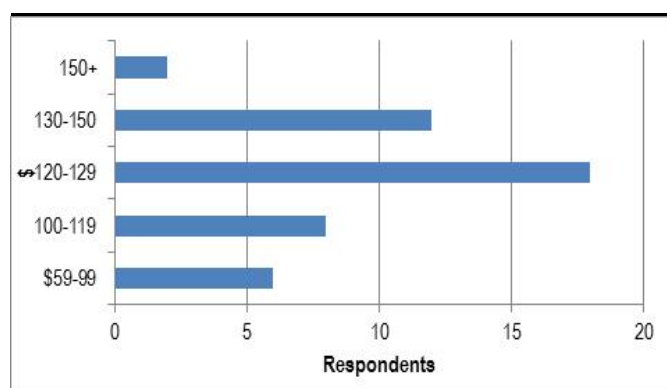
Industry execs much more constructive on transition auctions than investors

The majority of all participants believe clearing price will be in the range of \$120-\$150/MW-day for CP transition, with investors biasing towards our range of \$120-129, while industry was firmly in the camp of \$130-150/MW-day for 2016/17. In fact, industry participants firmly saw \$150/MW-day or better as the most likely outcome for the 2017/18 transition auction.

The majority of all participants believe clearing price will be in the range of \$120-\$150/MW-day for CP transition, with investors biasing towards our range of \$120-129, while industry was firmly in the camp of \$130-150/MW-day for 2016/17.

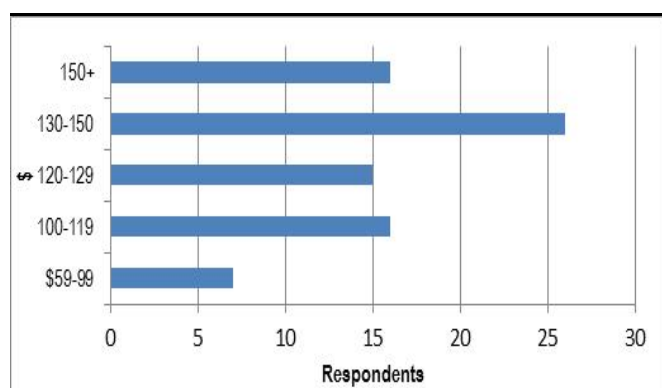
In fact, industry participants firmly saw \$150/MW-day or better as the most likely outcome for the 2017/18 transition auction.

Figure 4: Price Expectations from First Transition Auction – Investors



Source: UBS Survey

Figure 5: Price Expectations from First Transition Auction – Industry Participants



Source: UBS Survey

However much more aligned on the base auction around \$160/MW-day

As for the base Capacity Performance 2018/2019 auction to be held later this summer, investors and industry are more closely aligned. While industry executives are still more positively biased towards the \$160-\$180/MW-day range, investors appear more fickle around the \$160/MW-day mark, also in-line with our expectations.

Less confidence on regional separation, but PSEG tops the list

The majority of respondents believe the Public Service zone will break out as opposed to our expectations for ComEd to separate. Given the provision of wider bidding latitude under the revised PJM CP rules, we see a greater potential for other regions to clear separately. We emphasize the need for cash-starved nuclear plants in ComEd could well push the region higher than adjacent zones

Only one region will be modelled out – RTO

Among the critical factors in the incremental auction will be the limited granularity of results, without any ability for specific zones (LDAs) to break out at higher prices. Rather, the planning parameters will prove a simple aggregation across the entire footprint, with the procurement thresholds not necessarily proscribed by region. Implicitly this could well result in most of the units being from the RTO region as the 'clearing units'. Notably, it was precisely the coal and nuclear units in the wider RTO region that had the biggest compliance issues when it came to the polar vortex in any event.

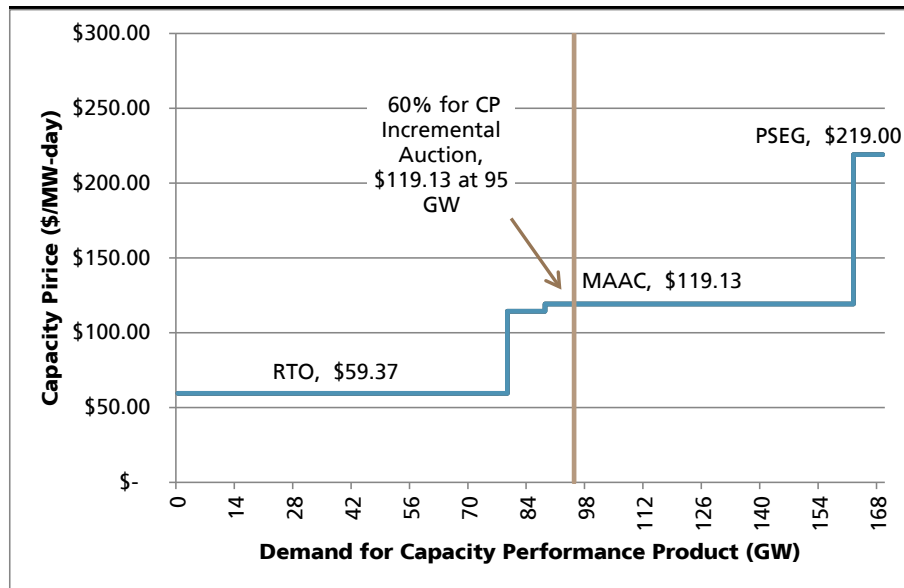
Looking at the total procurement

We view at least \$119/MW-day as a likely outcome for the first two incremental capacity auctions under PJM's Capacity Performance rules. As illustrated in the tables above, satisfying the requirement to supply 95 GW (60% of demand from the 2016/17 BRA) compares to about 79,803 MW of RTO generation that cleared at \$59.37 in the BRA and another 66,546 MW in MAAC that cleared at \$119.13. These numbers include DR and EE.

For the purpose of calculating comparative uplift in the tables below, we assume a 94.1% forced outage rate (EFORD) and that 90% of existing generation will be able to qualify for CP.

However as we note below, these lower quality assets that did not clear BRA may end up incurring significant CP performance penalties, thus giving back much of the incremental benefit.

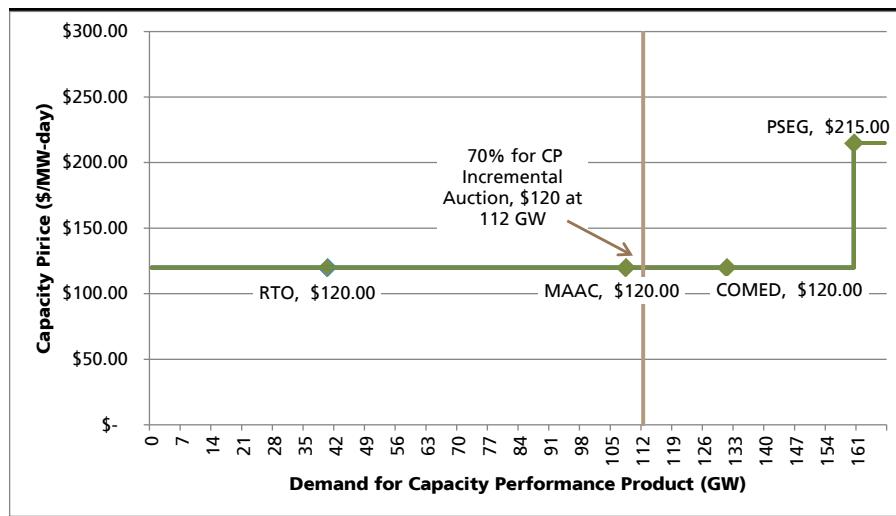
Figure 6: 2016/17 CP Supply (including DR and EE) vs Demand Curve Intersection at 60% Procurement Target



Source: PJM Interconnection, UBS Estimates

To ensure maximum likelihood of clearing, units are likely to be bid in at the price they received in the BRA (plus some additional premium to compensate for possible performance penalties) since BRA revenues are not placed at risk when choosing to participate in the incremental CP auctions. As illustrated in the next table, similar logic leads to at least \$120/MW-day for the 2nd incremental auction based on a 112 GW requirement as set forth in the auction parameters (70% of demand from the 2017/18 BRA).

Figure 7: 2017/18 CP Supply (including DR and EE) vs Demand Curve Intersection at 70% Procurement Target



Source: PJM Interconnection, UBS Estimates

As demonstrated in the tables above, once the outcome of the CP auction is determined, the next step is to apply the incremental price to the cleared MW, for which we assume a 94.1% forced outage rate (EFORD) and that about 90% of the MWs that cleared the BRA will qualify for CP. The units with the largest uplift are any units that did not clear the BRA (from EXC and FE primarily) and thus receive the full price (the increment is from zero). However as we note below, these lower quality assets that did not clear BRA may end up incurring significant CP performance penalties, thus giving back much of the incremental benefit.

Uncleared capacity: Quite unclear how levered to CP

Some investors have focused on the ability for EXC and FE among others to clear their previously uncleared capacity in the transition auctions. While a potential, we emphasize these units likely didn't clear due to their relative cost structure and wider performance concerns that could well hamper their ability to continue to clear under the transition, which would have yet a higher threshold of performance than the initial auction. That said, portfolio bidding benefits could provide some comfort to commit these units, rather than increase payments against previously committed units. The question remains whether those with the same uncleared capacity would opt to sell their units at the \$120/MW-day higher price. Taken altogether, we suspect companies will opt to commit for now, providing upside for both EXC and FE – as well as limited benefits for other equities with some uncleared capacity (NRG?). *FE has explicitly said it intends to bid in its uncleared units, principally Mansfield in the upcoming transition auction.*

Unclear if EXC and FE will commit – could take the risk on some?

FE has been clear it intends to bid in the uncleared units.

Breaking down the pricing uplift for generators

We emphasize that a safe assumption remains a ~\$60-70/MW-day uplift on RTO exposed generators for 2016/17 (near all ~64GW in that region), as well as ~20% of MAAC capacity uplift (accounting for the balance of capacity to be procured) at \$5-10/MW-day uplift. We see little chance the overall clearing price will reflect much better than \$10/MW-day given the less stringent penalties initially contemplated for transition period. In the best case scenarios, we see the risk premium as upwards of ~\$20/MW-day above the MAAC clearing price, driving an outcome closer to ~\$140/MW-day. This remains a relatively low probability event.

We see ~\$130/MW-day as a reasonable outcome for the auction reflecting a small premium on the higher reliability criteria for some MAAC and ComEd assets.

Thinking through the risk criteria and price caps

The critical question remains how much is the minimum that a generator would be willing to tolerate around accepting the more stringent penalty structures under CP. Price caps under the transition 2016/17 are equal to 50% of Net CONE (likely resulting in \$165/MW-day from RTO region) and 60% for the subsequent year (\$211/MW-day for RTO region); if regional Net CONE prices apply, then 2016/17 could see MAAC capped out at \$138/MW-day, very close to the our expected range of \$120-130/MW-day. In turn, the annual stop-loss penalties under 2016/17 transition period would be 75% of Net CONE and 90% for the subsequent year; this is contrast to 1.5x Net CONE for the full CP procurement embedded in 2018/19 auction onwards. Bottom line, lower risk equals lower potential upside.

Price caps on transition will also limit upside

The retail marketing offset: many deals already inked?

Lastly, full upside to EXC, NRG, and FE could well be mitigated by the negative impact of the CP procurement mandate on existing multi-year bundled and capacity-only arrangements. Bottom-line, existing energy commitments sold into state-procurements could mitigate some of the upside. Among the most important power procurement processes in NJ, the annual BGS auction, has committed to refund marketers for the added cost of passing through these higher costs. It remains unclear how many contracts signed in the sector already reflect the ability to pass through the impact of regulatory changes in bundled contracts for energy and capacity.

EXC and NRG may not get the full uplift given existing retail obligations

Legacy OH auction obligations will smooth uplift as well

Some regulatory pass-through will be allowed

What's the purpose of the transition auctions?

FERC largely agreed with PJM's reasoning that the 5-year transition period was necessary in order to make the price impact palatable to consumers. We emphasize the most significant jump in pricing is not likely in the upcoming 2018/19 auction this August, but rather, as CP moves towards 100% implementation for the 2020/2021 auction. While we expect further reforms prior to this final push upwards, we see an argument for a more meaningful pullback in Demand Response participation in the auction (expect a pullback even this year again too).

Statement of Risk

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.

Required Disclosures

This report has been prepared by UBS Securities LLC, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS.

For information on the ways in which UBS manages conflicts and maintains independence of its research product; historical performance information; and certain additional disclosures concerning UBS research recommendations, please visit www.ubs.com/disclosures. The figures contained in performance charts refer to the past; past performance is not a reliable indicator of future results. Additional information will be made available upon request. UBS Securities Co. Limited is licensed to conduct securities investment consultancy businesses by the China Securities Regulatory Commission.

Analyst Certification: Each research analyst primarily responsible for the content of this research report, in whole or in part, certifies that with respect to each security or issuer that the analyst covered in this report: (1) all of the views expressed accurately reflect his or her personal views about those securities or issuers and were prepared in an independent manner, including with respect to UBS, and (2) no part of his or her compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by that research analyst in the research report.

UBS Investment Research: Global Equity Rating Definitions

12-Month Rating	Definition	Coverage ¹	IB Services ²
Buy	FSR is > 6% above the MRA.	45%	36%
Neutral	FSR is between -6% and 6% of the MRA.	42%	32%
Sell	FSR is > 6% below the MRA.	13%	20%
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.	less than 1%	less than 1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	less than 1%	less than 1%

Source: UBS. Rating allocations are as of 30 June 2015.

1:Percentage of companies under coverage globally within the 12-month rating category. 2:Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.

3:Percentage of companies under coverage globally within the Short-Term rating category. 4:Percentage of companies within the Short-Term rating category for which investment banking (IB) services were provided within the past 12 months.

KEY DEFINITIONS: **Forecast Stock Return (FSR)** is defined as expected percentage price appreciation plus gross dividend yield over the next 12 months. **Market Return Assumption (MRA)** is defined as the one-year local market interest rate plus 5% (a proxy for, and not a forecast of, the equity risk premium). **Under Review (UR)** Stocks may be flagged as UR by the analyst, indicating that the stock's price target and/or rating are subject to possible change in the near term, usually in response to an event that may affect the investment case or valuation. **Short-Term Ratings** reflect the expected near-term (up to three months) performance of the stock and do not reflect any change in the fundamental view or investment case. **Equity Price Targets** have an investment horizon of 12 months.

EXCEPTIONS AND SPECIAL CASES: **UK and European Investment Fund ratings and definitions are:** **Buy:** Positive on factors such as structure, management, performance record, discount; **Neutral:** Neutral on factors such as structure, management, performance record, discount; **Sell:** Negative on factors such as structure, management, performance record, discount. **Core Banding Exceptions (CBE):** Exceptions to the standard +/-6% bands may be granted by the Investment Review Committee (IRC). Factors considered by the IRC include the stock's volatility and the credit spread of the respective company's debt. As a result, stocks deemed to be very high or low risk may be subject to higher or lower bands as they relate to the rating. When such exceptions apply, they will be identified in the Company Disclosures table in the relevant research piece.

Research analysts contributing to this report who are employed by any non-US affiliate of UBS Securities LLC are not registered/qualified as research analysts with the NASD and NYSE and therefore are not subject to the restrictions contained in the NASD and NYSE rules on communications with a subject company, public appearances, and trading securities held by a research analyst account. The name of each affiliate and analyst employed by that affiliate contributing to this report, if any, follows.

UBS Securities LLC: Julien Dumoulin-Smith; Michael Weinstein; Paul Zimbardo.

Company Disclosures

Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
American Electric Power, Inc. ^{2, 4, 6a, 6b, 7, 16}	AEP.N	Neutral	N/A	US\$55.21	22 Jul 2015
Exelon Corp. ^{4, 6a, 6c, 7, 16}	EXC.N	Neutral	N/A	US\$32.78	22 Jul 2015
FirstEnergy Corp. ¹⁶	FE.N	Sell	N/A	US\$33.32	22 Jul 2015
NRG Energy Inc. ¹⁶	NRG.N	Buy	N/A	US\$21.98	22 Jul 2015
Southern Company ^{2, 4, 6a, 16}	SO.N	Sell	N/A	US\$43.25	22 Jul 2015

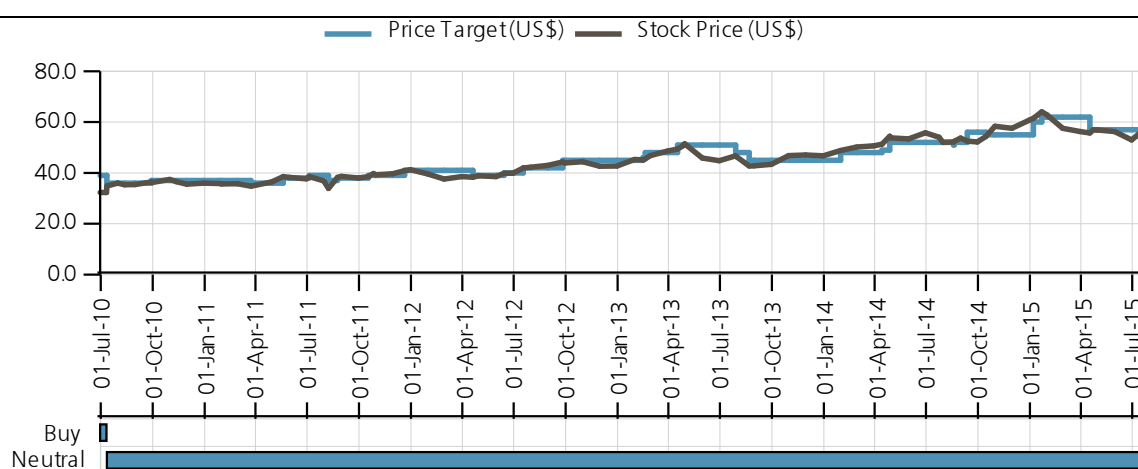
Source: UBS. All prices as of local market close.

Ratings in this table are the most current published ratings prior to this report. They may be more recent than the stock pricing date

2. UBS AG, its affiliates or subsidiaries has acted as manager/co-manager in the underwriting or placement of securities of this company/entity or one of its affiliates within the past 12 months.
4. Within the past 12 months, UBS AG, its affiliates or subsidiaries has received compensation for investment banking services from this company/entity or one of its affiliates.
- 6a. This company/entity is, or within the past 12 months has been, a client of UBS Securities LLC, and investment banking services are being, or have been, provided.
- 6b. This company/entity is, or within the past 12 months has been, a client of UBS Securities LLC, and non-investment banking securities-related services are being, or have been, provided.
- 6c. This company/entity is, or within the past 12 months has been, a client of UBS Securities LLC, and non-securities services are being, or have been, provided.
7. Within the past 12 months, UBS Securities LLC has received compensation for products and services other than investment banking services from this company/entity.
16. UBS Securities LLC makes a market in the securities and/or ADRs of this company.

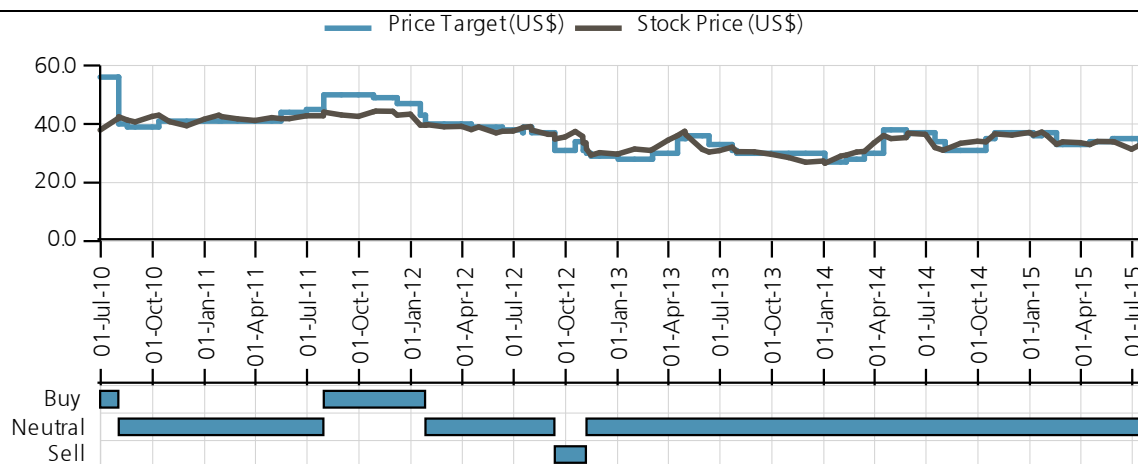
Unless otherwise indicated, please refer to the Valuation and Risk sections within the body of this report.

American Electric Power, Inc. (US\$)



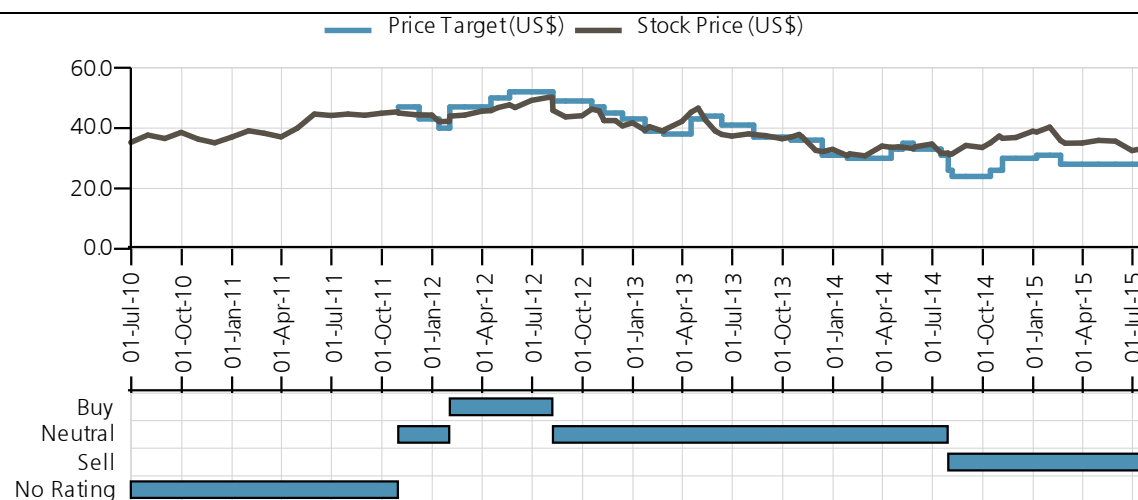
Source: UBS; as of 22 Jul 2015

Exelon Corp. (US\$)



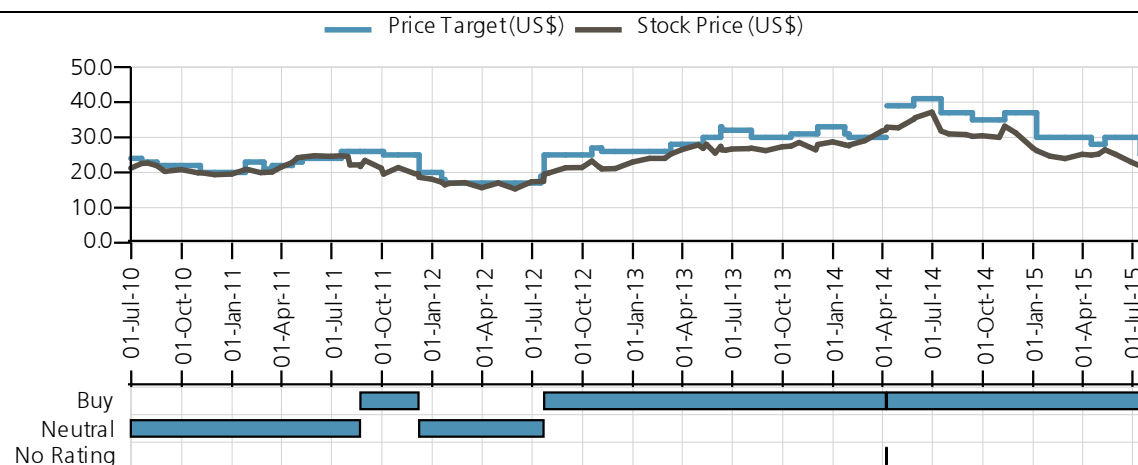
Source: UBS; as of 22 Jul 2015

FirstEnergy Corp. (US\$)



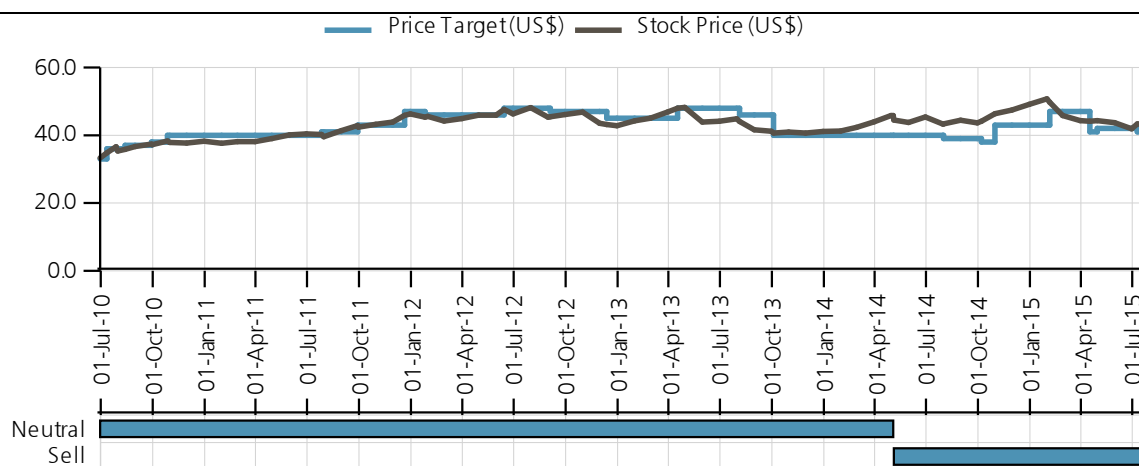
Source: UBS; as of 22 Jul 2015

NRG Energy Inc. (US\$)



Source: UBS; as of 22 Jul 2015

Southern Company (US\$)



Source: UBS; as of 22 Jul 2015

Global Disclaimer

This document has been prepared by UBS Securities LLC, an affiliate of UBS AG. UBS AG, its subsidiaries, branches and affiliates are referred to herein as UBS.

Global Research is provided to our clients through UBS Neo, the UBS Client Portal and UBS.com (each a "System"). It may also be made available through third party vendors and distributed by UBS and/or third parties via e-mail or alternative electronic means. The level and types of services provided by Global Research to a client may vary depending upon various factors such as a client's individual preferences as to the frequency and manner of receiving communications, a client's risk profile and investment focus and perspective (e.g. market wide, sector specific, long-term, short-term, etc.), the size and scope of the overall client relationship with UBS and legal and regulatory constraints.

When you receive Global Research through a System, your access and/or use of such Global Research is subject to this Global Research Disclaimer and to the terms of use governing the applicable System.

When you receive Global Research via a third party vendor, e-mail or other electronic means, your use shall be subject to this Global Research Disclaimer and to UBS's Terms of Use/Disclaimer (<http://www.ubs.com/global/en/legalinfo2/disclaimer.html>). By accessing and/or using Global Research in this manner, you are indicating that you have read and agree to be bound by our Terms of Use/Disclaimer. In addition, you consent to UBS processing your personal data and using cookies in accordance with our Privacy Statement (<http://www.ubs.com/global/en/legalinfo2/privacy.html>) and cookie notice (<http://www.ubs.com/global/en/homepage/cookies/cookie-management.html>).

If you receive Global Research, whether through a System or by any other means, you agree that you shall not copy, revise, amend, create a derivative work, transfer to any third party, or in any way commercially exploit any UBS research provided via Global Research or otherwise, and that you shall not extract data from any research or estimates provided to you via Global Research or otherwise, without the prior written consent of UBS.

For access to all available Global Research on UBS Neo and the Client Portal, please contact your UBS sales representative.

This document is for distribution only as may be permitted by law. It is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction where such distribution, publication, availability or use would be contrary to law or regulation or would subject UBS to any registration or licensing requirement within such jurisdiction. It is published solely for information purposes; it is not an advertisement nor is it a solicitation or an offer to buy or sell any financial instruments or to participate in any particular trading strategy. No representation or warranty, either expressed or implied, is provided in relation to the accuracy, completeness or reliability of the information contained in this document ('the Information'), except with respect to Information concerning UBS. The Information is not intended to be a complete statement or summary of the securities, markets or developments referred to in the document. UBS does not undertake to update or keep current the Information. Any opinions expressed in this document may change without notice and may differ or be contrary to opinions expressed by other business areas or groups of UBS. Any statements contained in this report attributed to a third party represent UBS's interpretation of the data, information and/or opinions provided by that third party either publicly or through a subscription service, and such use and interpretation have not been reviewed by the third party.

Nothing in this document constitutes a representation that any investment strategy or recommendation is suitable or appropriate to an investor's individual circumstances or otherwise constitutes a personal recommendation. Investments involve risks, and investors should exercise prudence and their own judgement in making their investment decisions. The financial instruments described in the document may not be eligible for sale in all jurisdictions or to certain categories of investors. Options, derivative products and futures are not suitable for all investors, and trading in these instruments is considered risky. Mortgage and asset-backed securities may involve a high degree of risk and may be highly volatile in response to fluctuations in interest rates or other market conditions. Foreign currency rates of exchange may adversely affect the value, price or income of any security or related instrument referred to in the document. For investment advice, trade execution or other enquiries, clients should contact their local sales representative.

The value of any investment or income may go down as well as up, and investors may not get back the full (or any) amount invested. Past performance is not necessarily a guide to future performance. Neither UBS nor any of its directors, employees or agents accepts any liability for any loss (including investment loss) or damage arising out of the use of all or any of the Information.

Any prices stated in this document are for information purposes only and do not represent valuations for individual securities or other financial instruments. There is no representation that any transaction can or could have been effected at those prices, and any prices do not necessarily reflect UBS's internal books and records or theoretical model-based valuations and may be based on certain assumptions. Different assumptions by UBS or any other source may yield substantially different results.

This document and the Information are produced by UBS as part of its research function and are provided to you solely for general background information. UBS has no regard to the specific investment objectives, financial situation or particular needs of any specific recipient. In no circumstances may this document or any of the Information be used for any of the following purposes:

- (i) valuation or accounting purposes;
- (ii) to determine the amounts due or payable, the price or the value of any financial instrument or financial contract; or
- (iii) to measure the performance of any financial instrument.

By receiving this document and the Information you will be deemed to represent and warrant to UBS that you will not use this document or any of the Information for any of the above purposes or otherwise rely upon this document or any of the Information.

Research will initiate, update and cease coverage solely at the discretion of UBS Investment Bank Research Management. The analysis contained in this document is based on numerous assumptions. Different assumptions could result in materially different results. The analyst(s) responsible for the preparation of this document may interact with trading desk personnel, sales personnel and other parties for the purpose of gathering, applying and interpreting market information. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS into other areas, units, groups or affiliates of UBS. The compensation of the analyst who prepared this document is determined exclusively by research management and senior management (not including investment banking). Analyst compensation is not based on investment banking revenues; however, compensation may relate to the revenues of UBS Investment Bank as a whole, of which investment banking, sales and trading are a part.

For financial instruments admitted to trading on an EU regulated market: UBS AG, its affiliates or subsidiaries (excluding UBS Securities LLC) acts as a market maker or liquidity provider (in accordance with the interpretation of these terms in the UK) in the financial instruments of the issuer save that where the activity of liquidity provider is carried out in accordance with the definition given to it by the laws and regulations of any other EU jurisdictions, such information is separately disclosed in this document. For financial instruments admitted to trading on a non-EU regulated market: UBS may act as a market maker save that where this activity is carried out in the US in accordance with the definition given to it by the relevant laws and regulations, such activity will be specifically disclosed in this document. UBS may have issued a warrant the value of which is based on one or more of the financial instruments referred to in the document. UBS and its affiliates and employees may have long or short positions, trade as principal and buy and sell in instruments or derivatives identified herein; such transactions or positions may be inconsistent with the opinions expressed in this document.

United Kingdom and the rest of Europe: Except as otherwise specified herein, this material is distributed by UBS Limited to persons who are eligible counterparties or professional clients. UBS Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. **France:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities France S.A. UBS Securities France S.A. is regulated by the ACPR (Autorité de Contrôle Prudentiel et de Résolution) and the Autorité des Marchés Financiers (AMF). Where an analyst of UBS Securities France S.A. has contributed to this document, the document is also deemed to have been prepared by UBS Securities France S.A. **Germany:** Prepared by UBS Limited and distributed by UBS Limited and UBS Deutschland AG. UBS Deutschland AG is regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin). **Spain:** Prepared by UBS Limited and distributed by UBS Limited and UBS Securities España SV, SA. UBS Securities España SV, SA is regulated by the Comisión Nacional del Mercado de Valores (CNMV). **Turkey:** Distributed by UBS Limited. No information in this document is provided for the purpose of offering, marketing and sale by any means of any capital market instruments and services in the Republic of Turkey. Therefore, this document may not be considered as an offer made or to be made to residents of the Republic of Turkey. UBS AG is not licensed by the Turkish Capital Market Board under the provisions of the Capital Market Law (Law No. 6362). Accordingly, neither this document nor any other offering material related to the instruments/services may be utilized in connection with providing any capital market services to persons within the Republic of Turkey without the prior approval of the Capital Market Board. However, according to article 15 (d) (ii) of the Decree No. 32, there is no restriction on the purchase or sale of the securities abroad by residents of the Republic of Turkey. **Poland:** Distributed by UBS Limited (spółka z ograniczoną odpowiedzialnością) Oddział w Polsce regulated by the Polish Financial Supervision Authority. Where an analyst of UBS Limited (spółka z ograniczoną odpowiedzialnością) Oddział w Polsce has contributed to this

document, the document is also deemed to have been prepared by UBS Limited (spółka z ograniczoną odpowiedzialnością) Oddział w Polsce. **Russia:** Prepared and distributed by UBS Bank (OOO). **Switzerland:** Distributed by UBS AG to persons who are institutional investors only. UBS AG is regulated by the Swiss Financial Market Supervisory Authority (FINMA). **Italy:** Prepared by UBS Limited and distributed by UBS Limited and UBS Italia Sim S.p.A. UBS Italia Sim S.p.A. is regulated by the Bank of Italy and by the Commissione Nazionale per le Società e la Borsa (CONSOB). Where an analyst of UBS Italia Sim S.p.A. has contributed to this document, the document is also deemed to have been prepared by UBS Italia Sim S.p.A. **South Africa:** Distributed by UBS South Africa (Pty) Limited (Registration No. 1995/011140/07), an authorised user of the JSE and an authorised Financial Services Provider (FSP 7328). **Israel:** This material is distributed by UBS Limited. UBS Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. UBS Securities Israel Ltd is a licensed Investment Marketer that is supervised by the Israel Securities Authority (ISA). UBS Limited and its affiliates incorporated outside Israel are not licensed under the Israeli Advisory Law. UBS Limited is not covered by insurance as required from a licensee under the Israeli Advisory Law. UBS may engage among others in issuance of Financial Assets or in distribution of Financial Assets of other issuers for fees or other benefits. UBS Limited and its affiliates may prefer various Financial Assets to which they have or may have Affiliation (as such term is defined under the Israeli Advisory Law). Nothing in this Material should be considered as investment advice under the Israeli Advisory Law. This Material is being issued only to and/or is directed only at persons who are Eligible Clients within the meaning of the Israeli Advisory Law, and this material must not be relied on or acted upon by any other persons. **Saudi Arabia:** This document has been issued by UBS AG (and/or any of its subsidiaries, branches or affiliates), a public company limited by shares, incorporated in Switzerland with its registered offices at Aeschenvorstadt 1, CH-4051 Basel and Bahnhofstrasse 45, CH-8001 Zurich. This publication has been approved by UBS Saudi Arabia (a subsidiary of UBS AG), a Saudi closed joint stock company incorporated in the Kingdom of Saudi Arabia under commercial register number 1010257812 having its registered office at Tatweer Towers, P.O. Box 75724, Riyadh 11588, Kingdom of Saudi Arabia. UBS Saudi Arabia is authorized and regulated by the Capital Market Authority to conduct securities business under license number 08113-37. **Dubai:** The information distributed by UBS AG Dubai Branch is intended for Professional Clients only and is not for further distribution within the United Arab Emirates. **United States:** Distributed to US persons by either UBS Securities LLC or by UBS Financial Services Inc., subsidiaries of UBS AG; or by a group, subsidiary or affiliate of UBS AG that is not registered as a US broker-dealer (a **'non-US affiliate'**) to major US institutional investors only. UBS Securities LLC or UBS Financial Services Inc. accepts responsibility for the content of a document prepared by another non-US affiliate when distributed to US persons by UBS Securities LLC or UBS Financial Services Inc. All transactions by a US person in the securities mentioned in this document must be effected through UBS Securities LLC or UBS Financial Services Inc., and not through a non-US affiliate. **Canada:** Distributed by UBS Securities Canada Inc., a registered investment dealer in Canada and a Member-Canadian Investor Protection Fund, or by another affiliate of UBS AG that is registered to conduct business in Canada or is otherwise exempt from registration. **Brazil:** Except as otherwise specified herein, this material is prepared by UBS Brasil CCTVM S.A. to persons who are eligible investors residing in Brazil, which are considered to be: (i) financial institutions, (ii) insurance firms and investment capital companies, (iii) supplementary pension entities, (iv) entities that hold financial investments higher than R\$300,000.00 and that confirm the status of qualified investors in written, (v) investment funds, (vi) securities portfolio managers and securities consultants duly authorized by Comissão de Valores Mobiliários (CVM), regarding their own investments, and (vii) social security systems created by the Federal Government, States, and Municipalities. **Hong Kong:** Distributed by UBS Securities Asia Limited and/or UBS AG, Hong Kong Branch. **Singapore:** Distributed by UBS Securities Pte. Ltd. [MCI (P) 016/09/2014 and Co. Reg. No.: 198500648C] or UBS AG, Singapore Branch. Please contact UBS Securities Pte. Ltd., an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110); or UBS AG, Singapore Branch, an exempt financial adviser under the Singapore Financial Advisers Act (Cap. 110) and a wholesale bank licensed under the Singapore Banking Act (Cap. 19) regulated by the Monetary Authority of Singapore, in respect of any matters arising from, or in connection with, the analysis or document. The recipients of this document represent and warrant that they are accredited and institutional investors as defined in the Securities and Futures Act (Cap. 289). **Japan:** Distributed by UBS Securities Japan Co., Ltd. to professional investors (except as otherwise permitted). Where this document has been prepared by UBS Securities Japan Co., Ltd., UBS Securities Japan Co., Ltd. is the author, publisher and distributor of the document. Distributed by UBS AG, Tokyo Branch to Professional Investors (except as otherwise permitted) in relation to foreign exchange and other banking businesses when relevant. **Australia:** Clients of UBS AG: Distributed by UBS AG (Holder of Australian Financial Services License No. 231087). Clients of UBS Securities Australia Ltd: Distributed by UBS Securities Australia Ltd (Holder of Australian Financial Services License No. 231098). Clients of UBS Wealth Management Australia Ltd: Distributed by UBS Wealth Management Australia Ltd (Holder of Australian Financial Services License No. 231127). This Document contains general information and/or general advice only and does not constitute personal financial product advice. As such, the information in this document has been prepared without taking into account any investor's objectives, financial situation or needs, and investors should, before acting on the information, consider the appropriateness of the information, having regard to their objectives, financial situation and needs. If the information contained in this document relates to the acquisition, or potential acquisition of a particular financial product by a 'Retail' client as defined by section 761G of the Corporations Act 2001 where a Product Disclosure Statement would be required, the retail client should obtain and consider the Product Disclosure Statement relating to the product before making any decision about whether to acquire the product. The UBS Securities Australia Limited Financial Services Guide is available at: www.ubs.com/ecs-research-fsg. **New Zealand:** Distributed by UBS New Zealand Ltd. The information and recommendations in this publication are provided for general information purposes only. To the extent that any such information or recommendations constitute financial advice, they do not take into account any person's particular financial situation or goals. We recommend that recipients seek advice specific to their circumstances from their financial advisor. **Korea:** Distributed in Korea by UBS Securities Pte. Ltd., Seoul Branch. This document may have been edited or contributed to from time to time by affiliates of UBS Securities Pte. Ltd., Seoul Branch. **Malaysia:** This material is authorized to be distributed in Malaysia by UBS Securities Malaysia Sdn. Bhd (Capital Markets Services License No.: CMSL/A0063/2007). This material is intended for professional/institutional clients only and not for distribution to any retail clients. **India:** Prepared by UBS Securities India Private Ltd. (Corporate Identity Number U67120MH1996PTC097299) 2/F, 2 North Avenue, Maker Maxity, Bandra Kurla Complex, Bandra (East), Mumbai (India) 400051. Phone: +912261556000. It provides brokerage services bearing SEBI Registration Numbers: NSE (Capital Market Segment): INB230951431, NSE (F&O Segment) INF230951431, NSE (Currency Derivatives Segment) INE230951431, BSE (Capital Market Segment) INB010951437; merchant banking services bearing SEBI Registration Number: INM000010809 and research services. UBS AG, its affiliates or subsidiaries may have debt holdings or positions in the subject Indian company/companies. Within the past 12 months, UBS AG, its affiliates or subsidiaries may have received compensation for non-investment banking securities-related services and/or non-securities services from the subject Indian company/companies. With regard to information on associates, please refer Annual Report at: http://www.ubs.com/global/en/about_ubs/investor_relations/annualreporting.html

The disclosures contained in research documents produced by UBS Limited shall be governed by and construed in accordance with English law.

UBS specifically prohibits the redistribution of this document in whole or in part without the written permission of UBS and UBS accepts no liability whatsoever for the actions of third parties in this respect. Images may depict objects or elements that are protected by third party copyright, trademarks and other intellectual property rights. © UBS 2015. The key symbol and UBS are among the registered and unregistered trademarks of UBS. All rights reserved.

