

MARKETVIEWS

November 2017

CEE'S 22ND ANNUAL MEETING IS ON DECEMBER 12-13

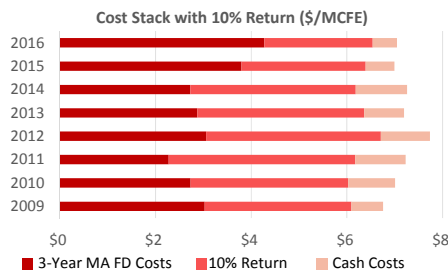
Have you [registered](#) yet?

We have another excellent agenda to induce frank discussions (recall, we follow Chatham House Rules).

This year's theme is "RISK and Uncertainty – A Return to *EEEE!*conomics." The unending quest is to better define, measure and mitigate the economics of risk and uncertainty in practical ways, across the integrated Energy-Environment-Economics themes.

Don't forget to [submit](#) your "what keeps me up at night" contributions.

CEE Producer Health Tracker

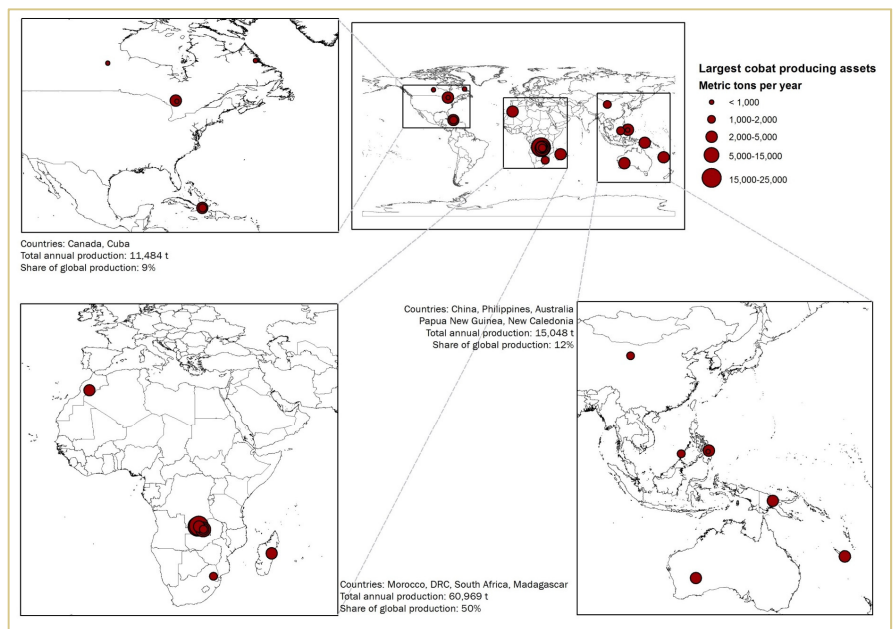


On average, dry gas producers need higher prices than current levels. Current oil prices, on the other hand, are sufficient for 10% return although not to cover full-cycle costs.

WHY SHOULD WE CARE ABOUT COBALT?

Because the price of cobalt, a key ingredient of the lithium-ion battery chemistry, has increased 152% since January 2016, 84% from January 2017 alone. Almost 42% of total cobalt production is used in battery manufacturing. Cobalt production will need to grow and grow fast if the world is to realize even moderate growth scenarios envisioned for electric vehicles and grid storage.

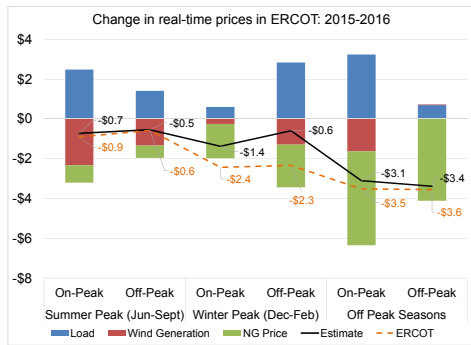
Cobalt production is highly concentrated: the Democratic Republic of Congo produced 62% of global mine production in 2016, and exported almost all of it to China, which hosts about 38% of cobalt refining capacity in the world.



Currently, there are over 250 cobalt projects in Australia, Canada, and elsewhere in various stages of exploration and feasibility. We focus on the commercial frameworks across the global cobalt value chains that would facilitate viable development of the resource. In the meantime, price and its volatility may continue to increase.

Cobalt is one the critical minerals we investigate. This research builds on our past efforts in critical minerals. For example, see [Battery Materials Value Chains](#), released in April 2016 and [Electric Vehicle Diffusion and Raw Materials Supply Chains](#), released in November 2016.

The negative impact of wind on electricity prices cannot be ignored

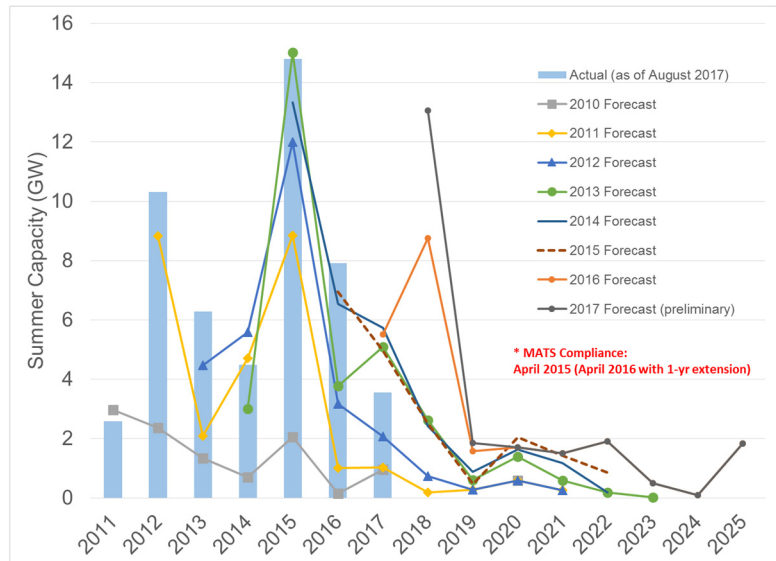


In the most competitive electricity market in the world, ERCOT, low natural gas prices continued to suppress wholesale electricity prices but the increased wind generation also had a sizeable negative impact. Luckily for generators, there is load growth in Texas unlike many other parts of the U.S. Load growth mitigated the downward pressure on electricity prices but only partially. No wonder, some coal plants decided to retire in 2018.

COAL RETIREMENTS CONTINUE AS WE WAIT FOR FERC ACTION ON THE DOE NOPR

We have been tracking coal retirements for some time now. Although the retirements reached a peak in 2015 to comply with MATS, utilities are expected to retire more coal capacity in 2018 and beyond. Note the jump in forecasted 2018 retirements from 2015 (2.5 GW) to 2016 (8.8 GW). The DOE NOPR does not apply to generation units under cost-of-service regulation. Recently, merchant generators announced coal retirements in 2018 but most came from the ERCOT market (4.2 GW owned by Luminant), which is not subject to FERC jurisdiction.

Continuing Exodus of Coal-Fired Generation



Most utility retirements seem to be driven fundamentally by economics (low wholesale energy prices, lack of load growth). However in some cases, expected environmental compliance costs influenced utilities' decisions. Finally, there is also the desire to move away from coal towards natural gas and renewables as part of the integrated resource plans at least in some cases.

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There are still plenty of old coal plants with low capacity factors facing costly environmental upgrades. The youngest utility-owned unit to retire in 2018 started operations in 1988, most before 1978. The youngest merchant unit to retire in ERCOT came online in 2009.

Merchant retirements in ERCOT are driven purely by economics. One of the units to retire started operation in 2009.

Merchant coal-fired generators outside ERCOT might be waiting for the FERC decision on "resilience subsidy," which is yet another step in the vicious cycle of subsidies undermining competitive markets as we discussed in October 2017 MarketViews. Merchant operators may announce more retirements if FERC fails to deliver a satisfactory "interim solution" on December 11. We will report on this decision in our December MarketViews.