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Philadelphia Area Municipal Analysts Society Meeting

Panel: Electric Industry Transition Including Disruptive Technologies Such as Battery Storage

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Electric industry transition including disruptive new technologies such as battery storage-Panel

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U.S.Electric Utility Outlook 2018

US regulated utilities outlook is stable

Continued regulatory support underpins cash flows

NEGATIVE	STABLE	POSITIVE
What could change outlook to negative » A more contentious regulatory environment that dented cash flow such that the debt coverage ratio fell below 18%	» Debt coverage ratio to remain healthy near 22% » Regulators will continue to support PP&E additions because customer rates have stayed flat » However, we are beginning to see instances of regulatory pushback in some states	What could change outlook to positive » A debt coverage ratio rising toward 25%, which could happen if utilities reduce leverage significantly

Note: A negative industry outlook indicates our view that fundamental business conditions will worsen. A positive outlook indicates that we expect fundamental business conditions to improve. A stable industry outlook indicates that conditions are not expected to change significantly. Since industry outlooks represent our forward looking view on conditions that factor into ratings, a negative (positive) outlook indicates that negative (positive) rating actions are more likely on average.

US public power electric utilities outlook is stable

Cost recovery ability continues as carbon transition looms

NEGATIVE ← **STABLE** → **POSITIVE**

NEGATIVE

What could change outlook to negative

- A debt coverage ratio moving below 1.50x or a significant challenge to the sector's ability to recover costs

STABLE

- Median debt coverage ratio to hold steady around 1.80x
- Competitive customer rates will continue to hold flat, a sector positive
- System resilience is high but may be tested by industry transition to lower carbon use and by cyber-related issues

POSITIVE

What could change outlook to positive

- A debt coverage ratio moving above 2.0x

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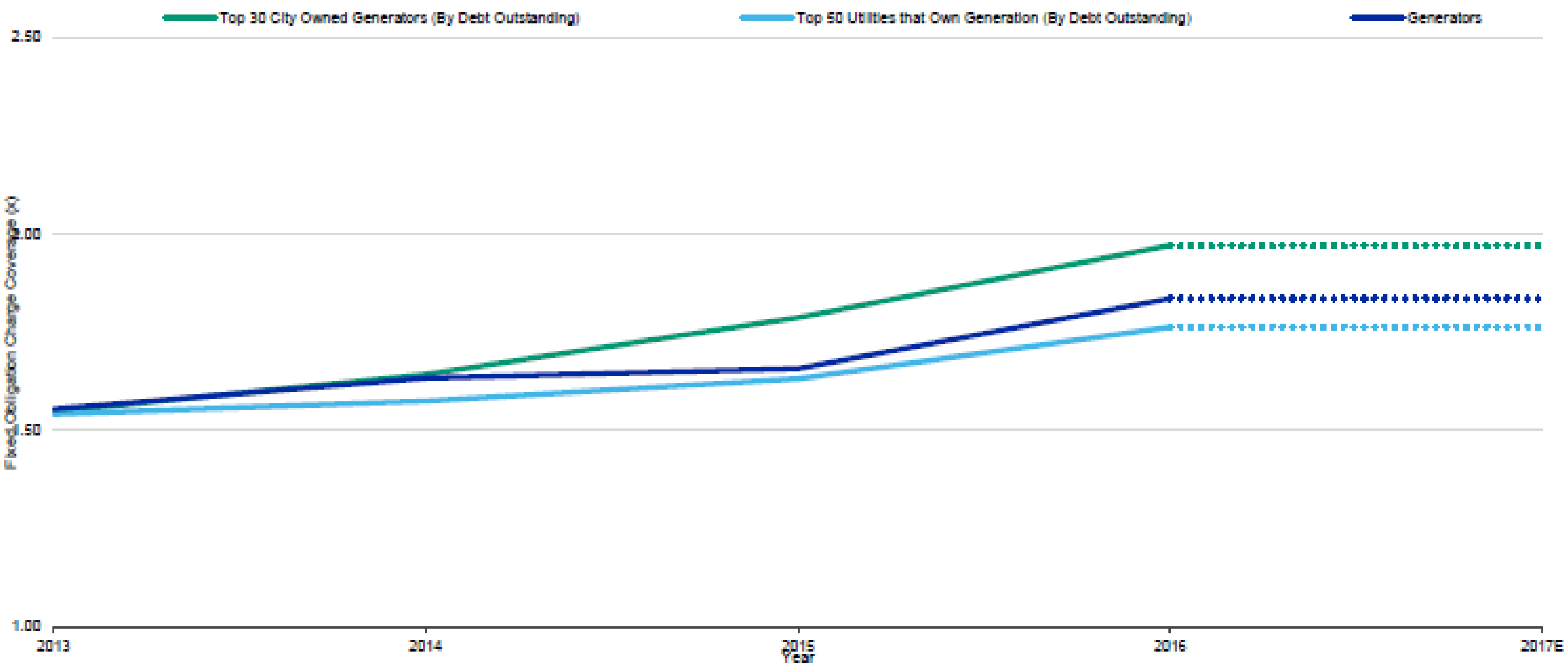
US public power electric utilities

Cost recovery ability continues as carbon transition looms

» Sector's fundamental strength is self-regulated ability to set retail electricity rates to pay debt service

Fixed obligation charge coverage continues to be strong

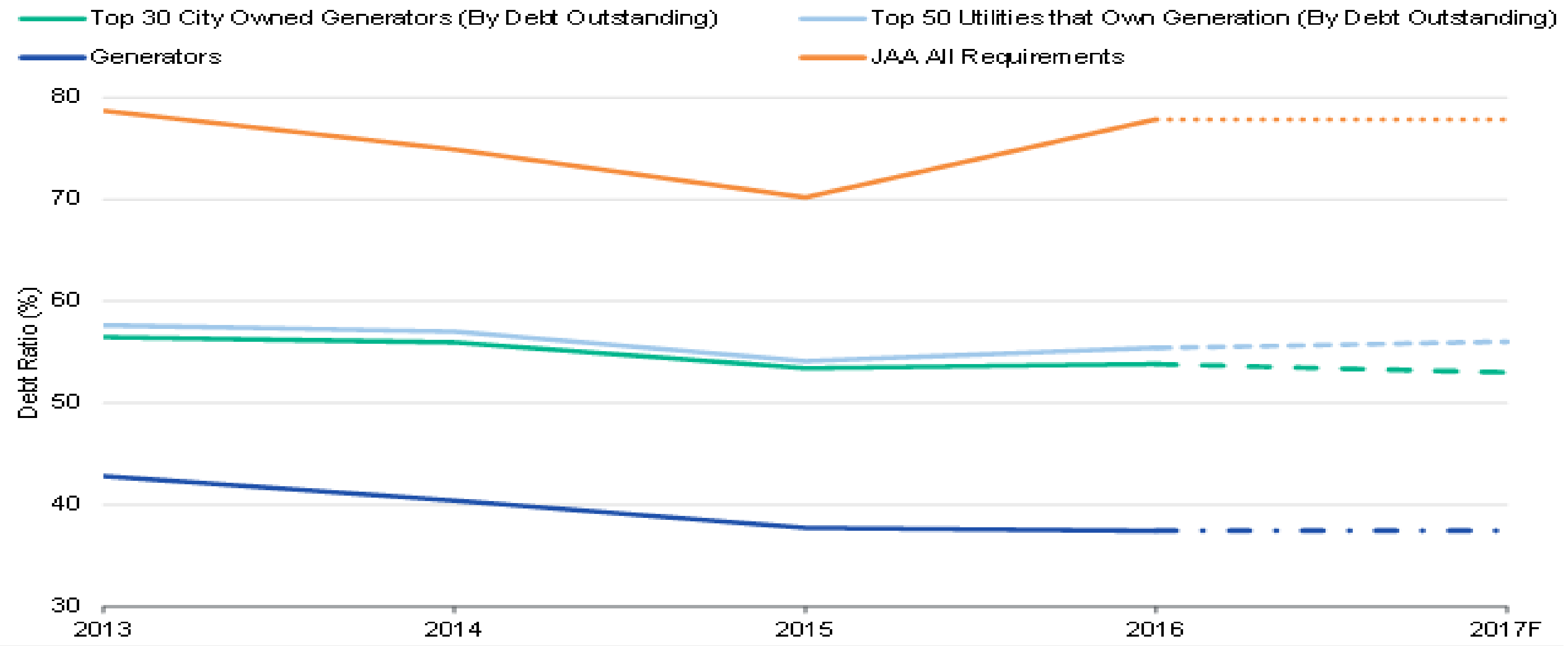


Source: Public power electric utility financial statements; Moody's Investors Service adjustments

2018 US Public Power Outlook

Debt levels remains steady between 2013-2017

- We expect that the median debt ratio in 2017 to be about 40%
- For the largest 50 public power electric utility generators, we expect the debt ratio of about 55% will remain largely unchanged in 2018, as debt amortizes and declining electricity demand limits the need to invest in new generation.
- Efforts to address existing environmental rules related to coal-fired generation or renewable power might increase financing requirements.

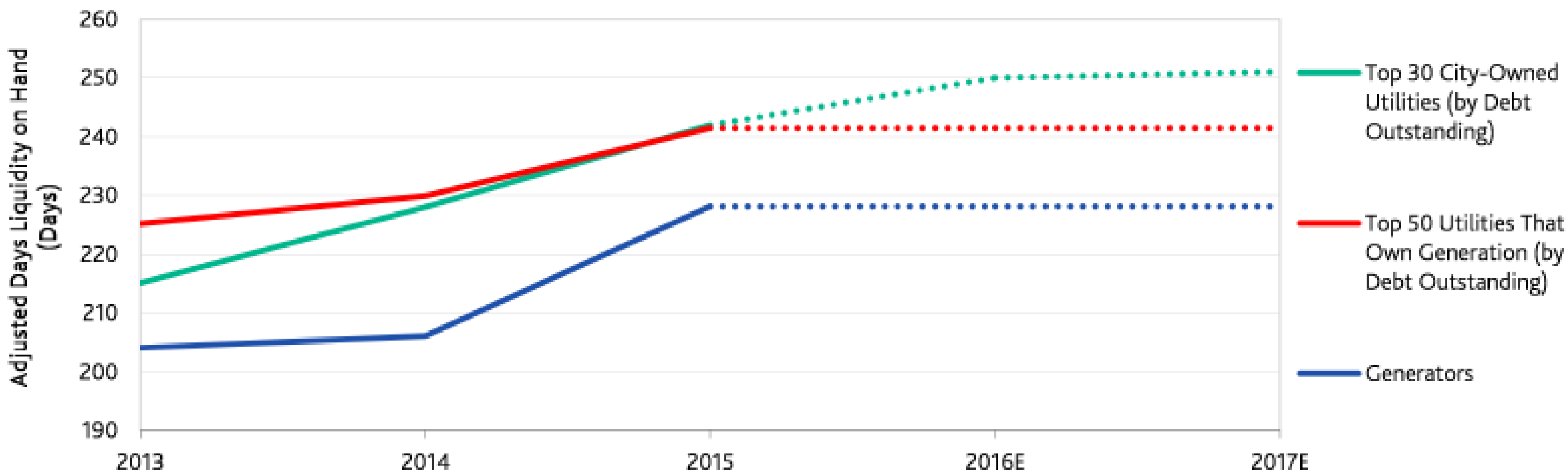


2018 US Public Power Outlook

Adjusted days liquidity on hand should continue to remain stable

For 2013-2017 , days of liquidity on hand remains unchanged between 200-250 days.

Median days liquidity on hand on an adjusted basis will also hold steady



Note: Dotted lines are Moody's Investors Service estimates.
Sources: Utility financial statements for historical figures; Moody's Investors Service service for 2016 and 2017 estimates

Assumptions we incorporate in our stable outlook analysis:

» The public power business model, including local governance and self-regulated rate-setting, will remain intact in 2018.

» Public power electric utilities will continue to adapt to regional energy markets. We don’t expect regional energy markets to fail; we expect them to be beneficial to public power electric utilities, with energy prices remaining low but putting continued pressure on baseload coal and nuclear assets.

» Growth in US gross domestic product will be 2.3% in 2018 and 2.1% in 2019, with unemployment at 4% in both years, according to Moody's Macroeconomic board.

» There will be three interest rate adjustments by the Federal Reserve in 2018 and normalization of the Federal Reserve balance sheets will proceed through 2018 and 2019, according to Moody’s Macroeconomic board.

» Natural gas prices will be in the $2.00-$3.50 per million BTU (MMBtu) range at Henry Hub through 2018, according to Moody’s forecasts.

» Delivered coal prices to be $2.20 per MMBtu in 2018 compared with $2.13 per MMBtu in 2017, according (EIA).

» Delivered electricity demand to rise 0.8% in 2018 over 2017, according to EIA.

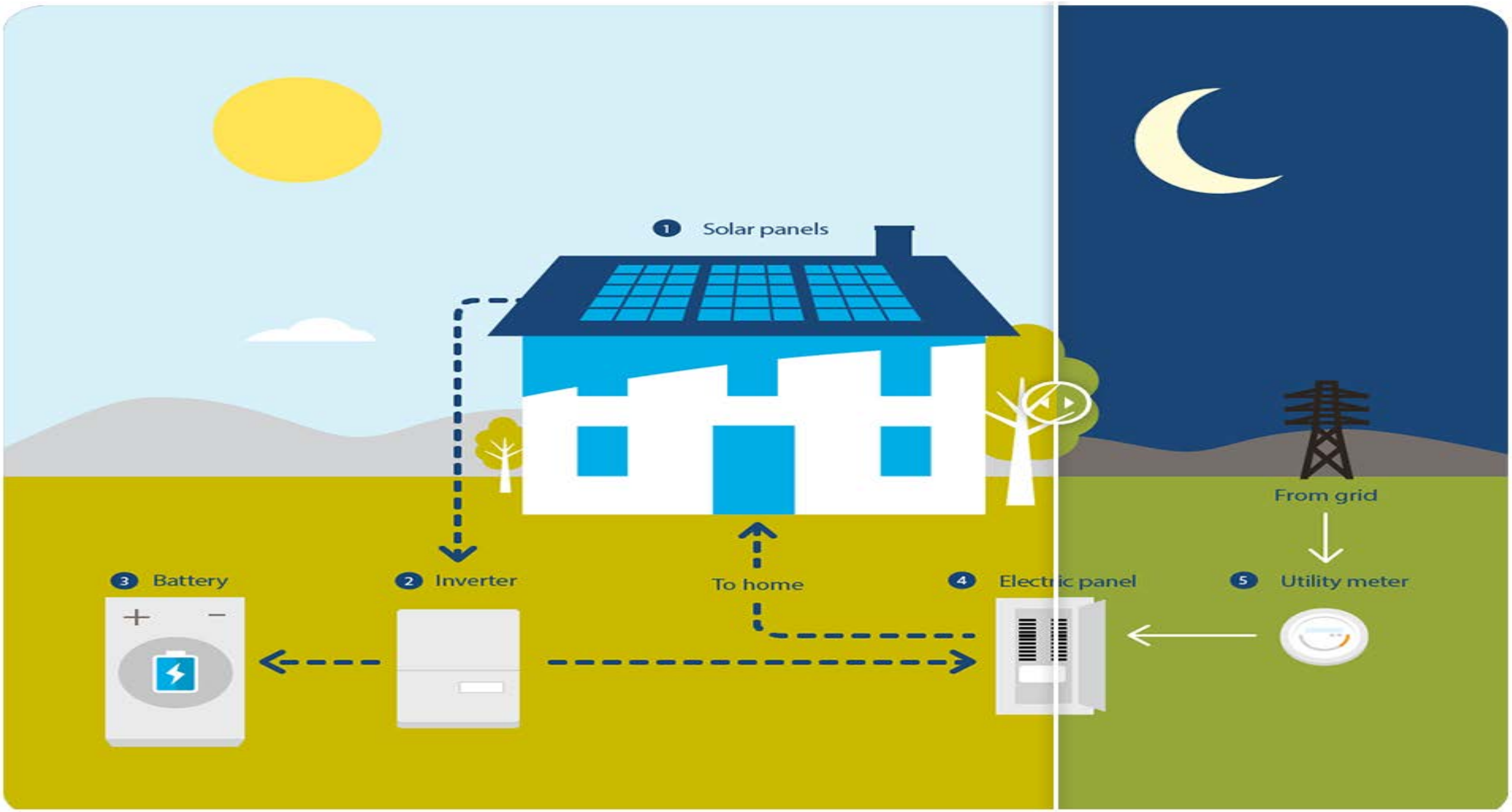
Challenges

- Clean energy transition risks

- Fixed cost recovery certainty as technology and distributive generation advance

Clean energy transition

Cost recovery risks



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