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The New England Compromise

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Data Sources Used in This Publication
ISO New England
U.S. Energy Information Administration
Federal Energy Regulatory Commission
National Energy Technology Laboratory

To discover more about the data sources used, click here.

Resilience and Reliability

Resiliency and reliability have been New England power market buzzwords in recent months. This worry over the reliability of the generation fleet to meet peak demand and its resilience during severe weather, exacerbated during the late December-early January "bomb cyclone," stems from the replacement of coal and oil/dual-fuel plants with a generation portfolio that increasingly consists of intermittent renewable and fuel-constrained natural gas. There have been varying responses across the grid regarding how best to meet the challenges of resiliency and reliability given the changing generation mix. Capacity markets have been widely discussed as a potential solution to the problem. This note looks at the effectiveness of New England ISO's recent reforms to capacity market auctions to accommodate subsidized renewable resources.

This capacity reform strikes a balance between protecting market competitiveness and allowing for an increasingly subsidized generation queue. Subsidization clouds the economic signals necessary to incentivize entry and exit. The ISO attempts to come to a compromise with respect to these opposite priorities through the Competitive Auctions with Sponsored Policy Resources (CASPR), a revision to its forward capacity market (FCM). However, while New England has a history of compromise dating back to the Founding Fathers, it has struggled to reach it recently in energy markets.

New England Capacity Market Reform

CASPR, which recently received the green light with a mixed vote from the Federal Energy Regulatory Commission, is a revision to the FCM that creates a second-round substitution market. The previous capacity market only had one round subject to the minimum offer price restriction (MOPR) with only a 200-megawatt-per-year MOPR exemption for subsidized renewable capacity offerings. With the onslaught of renewable megawatts coming down the pipeline, the 200 MW limit is inadequate. However, flooding the capacity market with those additional megawatts would hinder its economics. To accommodate larger projects without letting them flood the market, a second-round substitution market was formulated.

The new second round will not be subject to MOPR rules and thus enables a subset of capacity to clear the market, leaving the original auction cleaner and without unsubsidized unit offers. The second round has limitations in that it only allows subsidized policy resources (SPR) to reoffer capacity from older at-risk generation willing to exit the market. Hence the second stage is voluntary and limited only to generators willing to buy back their capacity. Only subsidized renewables that qualify as SPRs as of Jan. 1, 2018, can reoffer in the substitution market, and the market still maintains an upper limit on the

number of subsidized renewables that can offer without MOPR. With this market mechanism in place, the CASPR reform will phase out the current 200 MWs of renewable generation that can apply for exemptions today.

Capacity Substitution

The 2022-23-time frame will be the first capacity market auction with the new rules in effect. In terms of renewables, Massachusetts is committed to bringing in 1,200 MWs of clean hydropower from Canada via a 1,200 MW transmission line from Quebec entering service in 2022. Massachusetts also issued requests for proposals for a portion of its 1,600 MWs offshore wind project, but it will be several years before these resources are available. The outlook on the other side of the auction is shown in Exhibit 1, which lists the at-risk generation looking to leave. While the capacity market is in many respects fuel-neutral, not all generation is created equal, and having access to reliable at-will generation is important for future capacity portfolios.

Exhibit 1 ISO New England At-Risk Generation

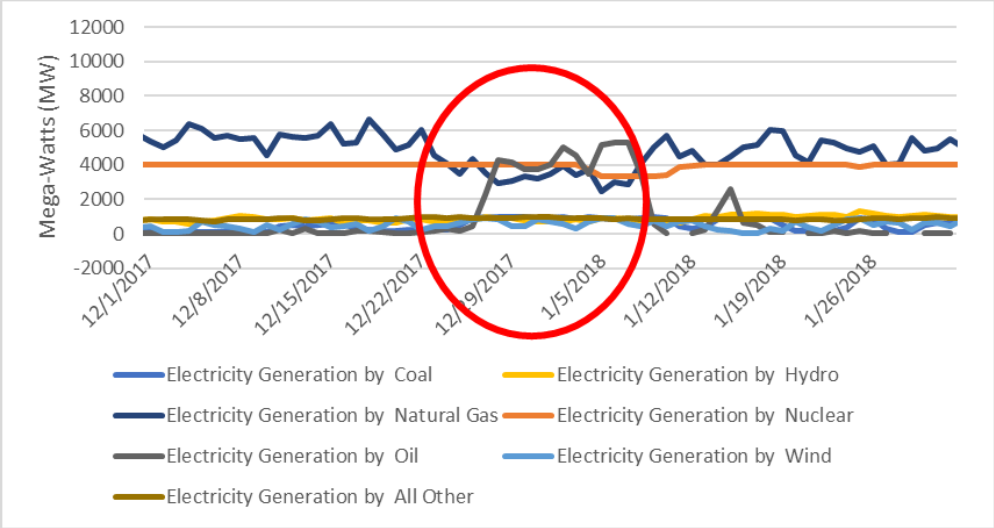
Plant	State	Fuel	MW
Merrimack	New Hampshire	Coal/Oil	496
Newington	New Hampshire	Steam NG	414
Schiller	New Hampshire	Coal/Oil	122
Wyman Energy Center	Maine	Oil	846
Mystic	Massachusetts	Oil	632
Canal	Massachusetts	NG/Oil	1165
Middletown Power	Connecticut	NG/Oil	786
GenConn Middletown	Connecticut	Oil	242
Montville	Connecticut	Oil	490
New Haven	Connecticut	Oil	640

Source: ISO New England, U.S. Energy Information Administration

Bomb Cyclone Effect

The at-will generation capability for New England was highlighted in the recent bomb cyclone. ISO-NE has around 6,200 MW of oil capacity, and this season, the grid approached its limit (Exhibit 2). Similar events in the future may put additional pressure on the grid to meet demand if additional oil/dual-fuel units retire, especially at times of low wind generation.

Exhibit 2 ISO New England Generation Fuel Mix



Source: ISO New England

A Tightening Race

As can be seen in the March 9 FERC filing, several complaints were logged against the CASPR proposal, with a number of them centered on the rules limiting eligibility for the second stage. Only designated subsidized renewables are eligible, and the rule does not leave eligibility open to include newer renewable entrants or storage technologies, which may be relevant in the future. While the renewable faction was unsatisfied by this constraint, the shift is still favorable overall to those seeking emission reductions.

The generation most likely to buy back its capacity are at-risk coal and nuclear generators in the region. As a stipulation, the substitution market requires those generators that buy back their capacity to retire it permanently and provides an economic incentive based on the spread between first-stage capacity and second-stage buyback revenue. This incentivizes at-risk generation capacity to retire, leaving ISO New England in a "race" to replace retirements, as CEO Gordon van Welie put it.

CASPR could lead to a quicker exodus of resilient at-will capable generation, leaving the region increasingly vulnerable and concerned about fuel security after the next FCM (as outlined earlier this year in ISO New England Gambling with Natural Gas). With 6.2 gigawatts of needed oil generation called on during the bomb cyclone, the generation still looks to be very much needed until there is a true one-for-one replacement.

Transmission Project Delays

The Northern Pass transmission project missed Massachusetts' March 27 deadline to attain New Hampshire's siting committee approval. The runner-up project is Central Maine Power's New England Clean Energy Connect project that has achieved approval for 95% of its route and provides access to

Quebec hydro power. In a fuel-constrained region with historically high regional power prices, this project should be a welcome addition to the fuel mix as long as there are no further delays.

Likelihood of Natural Gas Constraint Relief

The last major natural gas expansion was the Algonquin Incremental Market Project, which added 342 million cubic feet per day to the Algonquin Gas Transmission System in 2016. Kinder Morgan's Tennessee Gas Pipeline suspended its Northeast Energy Direct new pipeline project, and Enbridge's Algonquin Gas Transmission canceled its Access Northeast project. As a result, winter natural gas fuel constraints are unlikely to get a reprieve. New York's battle against the Millennium Valley Lateral project came to a head earlier this month, and while it should go through, the size of the fight against it is a telling example of the region's unwillingness to approve gas expansion.

Peak Versus Reserve Capacity

While capacity markets are an important measuring stick to ensure that the grid can reliably support peak demand, the discussion can sometimes become confused by worries over the impact of adding intermittent renewable generation. But forecast misses on renewable generation have a different response than those for traditional fuels—causing the grid to treat them as emergency outages that require reserve capacity—which can be described as an n-1 event. Renewable generation should in fact be thought of as a reduction in net load, so that misses in renewable forecasts react as if actual load is higher than expected.

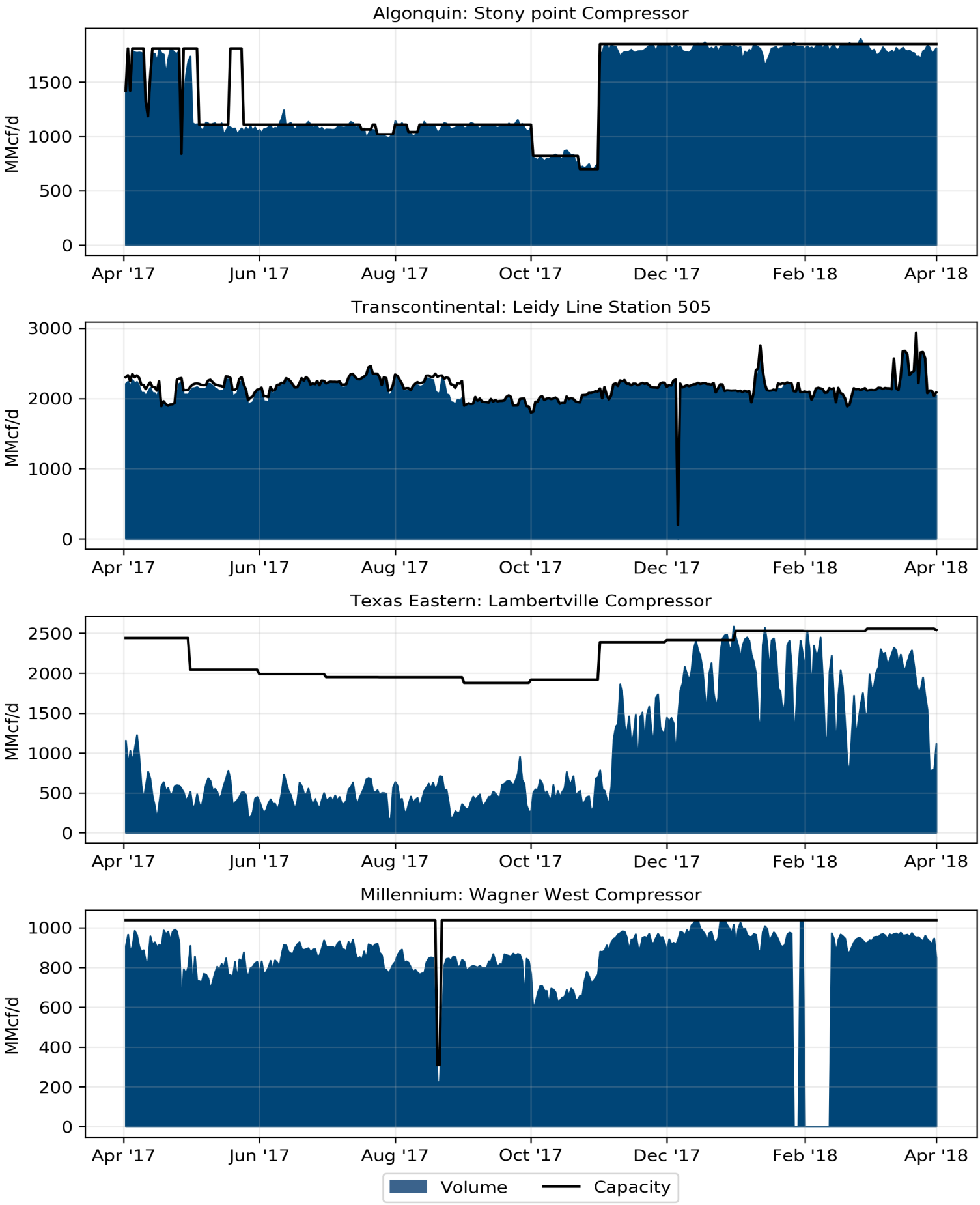
Since competitive capacity auctions are generally fuel-neutral, forward reserve capacity markets are the more logical space to address reliability issues with renewables. Especially if the reliability of at-will coal and nuclear capacity is valued by the energy market. There has been a seeming desire from regulators to mitigate the effects of picking winners and losers through specific generation subsidies. However, trying to shift the debate in the other direction within the capacity market space is equally an issue. Greater penetration of intermittent resources, the old n-1 and n-2 events for reserve capacity may be insufficient to mitigate the growth in variable renewable generation. If such a characteristic is truly necessary and valued in the market, then the forward reserve market needs to value the reserve the capacity needed in in order to meet outages due to natural gas fuel security, low wind, or traditional outages in an efficient way.

Capacity markets ensure that peaker units that do not get dispatched or needed regularly within the market have cost recovery to stay in the market for the few times they are used. The increase in renewable resources not only reduces demand and price, but ultimately pushes out existing baseload plants from the stack and does so in periods of low demand. Since the issue is that baseload plants have cost recovery issues somewhat similar to peakers, the reserve value in the grid can still be achieved competitively in the forward reserve market rather than using the FCM. This approach would create a revenue stream for these resources and maintain the flexibility to call them when needed. This sets up a competitive market solution that does not single out winners or losers but gives the market a solution to find the most economic mix of units that can achieve necessary reliability and resilience in the ISO, while consumers get a cleaner generation stack when such units are not needed.

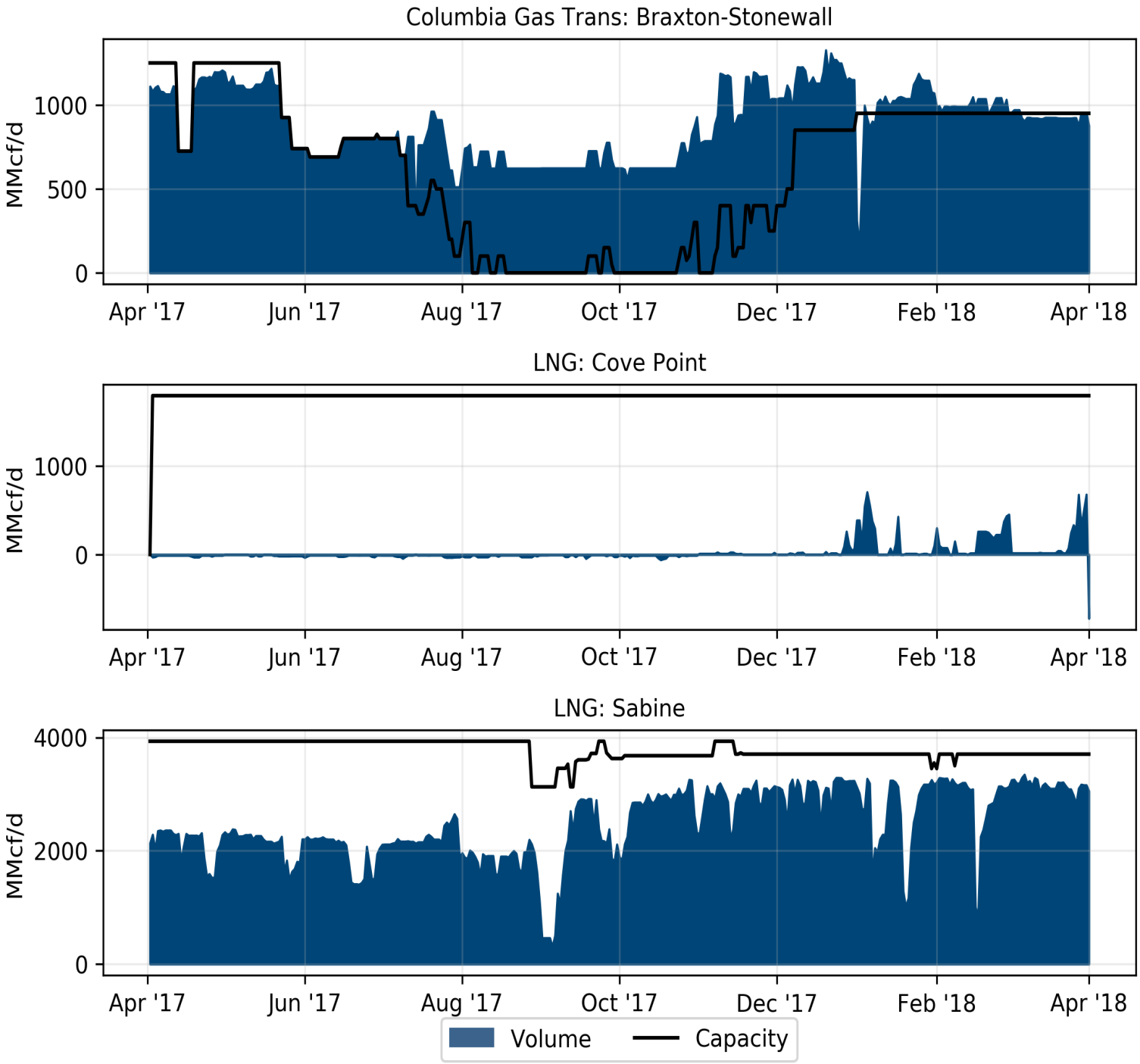
Conclusion

Capacity markets are by and large a result of legislatures and regulators concerned about maintaining a generation fleet that can meet peak demand. They are trying to solve a scarcity issue caused by an increase in variable renewables that increasingly shifts baseload units out of the stack during low load periods, leaving them unable to recoup expenses and looking for ways to abandon their capacity obligations. The key challenge is to determine the optimal at-will generation capacity needed to ensure that sufficient reserve capacity exists to resolve issues caused by gas-constrained cold snaps or low wind and solar generation environments. CASPR may be a necessary compromise toward mitigating subsidized generation for economic capacity, but it is not the answer to this ongoing challenge.

Natural Gas Important Points



Source: Pointlogic Energy



Source: Pointlogic Energy

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