New England Heat Wave a Portent for the Future?

U.S. Power and Gas Weekly

Morningstar Commodities Research
12 September 2018

Dan Grunwald
Associate, Power and Gas
+1 312 244-7135
daniel.grunwald@morningstar.com

Data Sources Used in This Publication
ISO New England
Point Logic Energy

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

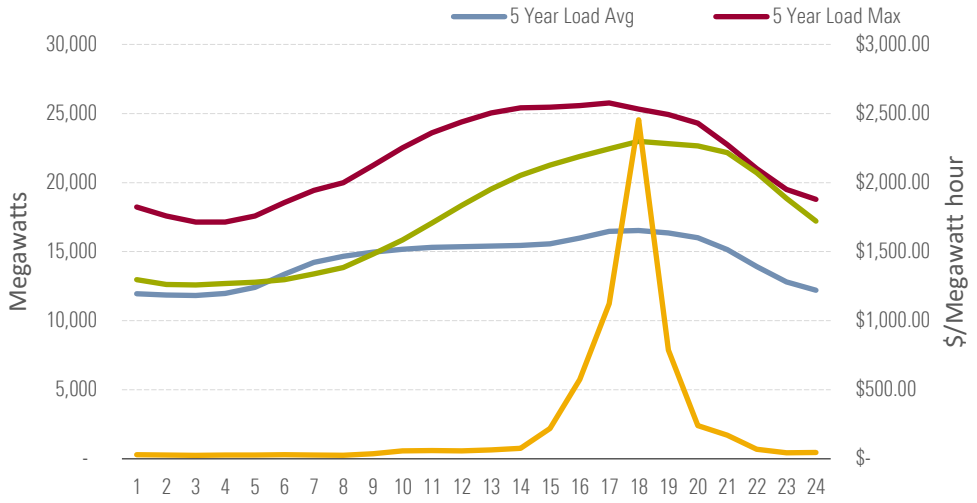
Emergency Procedures

On Sept. 3, ISO New England found itself in a bit of a bind, and as a result real time prices spiked to over $2,400/Mwh. In order to maintain reliability, the ISO resorted to two emergency procedures. While these procedures didn't require mandatory load shedding and rolling blackouts, they did halt maintenance activities and allowed the ISO to deplete 30-minute reserves. New England also asked market participants to reduce energy consumption and arranged for the purchase of emergency capacity and energy from NYISO and New Brunswick. While the price spike is a boon to generators, the cost to consumers is not so welcome. As we have reviewed before, the smaller scale of New England's ISO gives it less flexibility when compared with others like CAISO's EIM market or PJM. This note reviews the price spike and its future implications.

New England Weather Forecast and Demand Level

Labor Day weekend and other public holidays often bring lower demand profiles but can be tricky and the script can flip every once in a while. In this case, the holiday brought additional heat and demand that caught the region off guard. The ISO initially projected a peak load of 20,420 MW and ended up at 22,956 MW—a significant 2,400 MW miss. For the region, that level was still well under the demand extremes the region can experience in both summer and winter, as can be seen in Exhibit 1. And to be fair, New England can experience considerable differences between overnight baseload demand levels and the daytime peak, resulting in real time prices ranging from -$-20/MWh to over $80/MWh. Although this is by no means rare in a power market with an efficient pricing system, it is not a comforting sign when the ISO has to resort to emergency procedures at demand levels well below maximums

Exhibit 1 New England Load and Price Profile Versus Five-Year Average



Source: ISO New England

Generation Outages

A significant factor in this price spike was the level of capacity outages during higher-than-expected demand. Outages were still generally low compared with historical levels, at 1,766 MW on the 3rd, which drove the ISO to call on the higher cost portion of the generation stack. Outages all summer only fell below 1,000 MW a few times, so the extra 766 MW shows the current sensitivity of the stack to shifts. One of the notable outages—showing a string of bad luck—was Pilgrim Nuclear facility, which was also out due to transmission line issues, during the bomb cyclone last winter. The fact that Pilgrim was once again offline when the ISO needed it most is not entirely surprising, given Entergy's deal last month to hand over the plant for retirement by next June. This circumstance highlights the risk that as baseload units retire, the ISO shifts more often into a reliability situation that results in the need to implement emergency procedures. As Pilgrim retires next summer and other older baseload coal and natural gas plants exit the stack in the next couple of years, the ISO will have fewer resources to stave off the need to resort to emergency procedures. Keeping these older plants going is not necessarily the answer either as with age comes less reliability regardless.

Capacity Switching

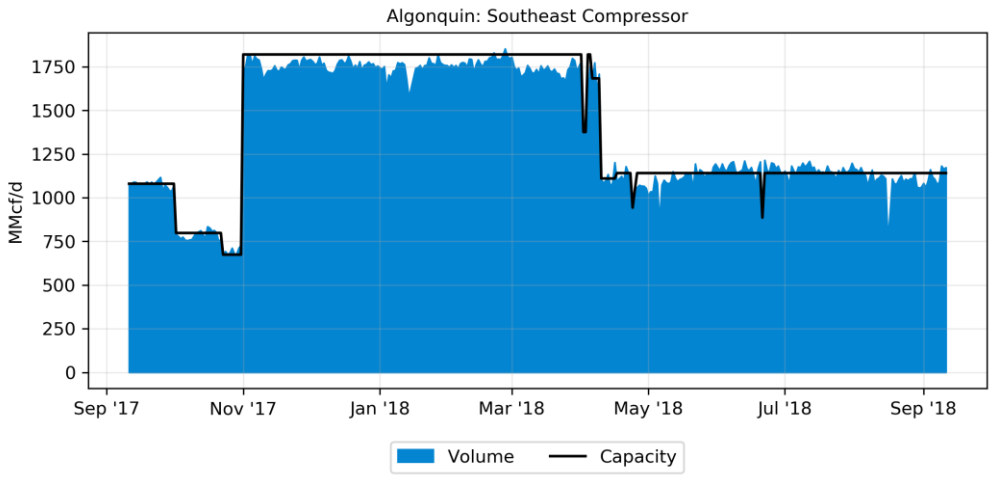
So far this year there has been around 82 MW of solar capacity added in New England, but that puts only a very small dent in the capacity needed to replace the likes of Pilgrim and other baseload plants slated for retirement. The main replacement capacity coming online so far this year and projects slated for next year are more efficient gas plants. Additions in May of this year at Salem Harbor Station (674 MW), Towantic Energy Center (805 MW), and a couple of added generators at Wallingford Energy (100 MW) were natural gas plants. Later this year we expect West Medway II to come online, providing an additional 200 MW. Next year we should see Bridgeport Harbor Station and Canal 3 come on line to provide an additional 576 and 350 MW, respectively. All told, that is an additional 1,579 MW so far this year and 1,126 MW by the time Pilgrim is set to retire next June with the loss of 683 MW. There is still a

bit under 1,000 MW of coal capacity in New England, which is mostly looking to retire. In summary, there is plenty of fossil fuel capacity coming online in New England, but it almost all relies on a single fuel source that is already constrained. This may be why we see a mix of combined cycle and combustion plants being built instead of just combined cycle. The added possibility of supply interruptions limits the added efficiencies of building combined cycle plants. It may be more practical to build plants that provide the flexibility to ramp up and down faster.

Natural Gas Import Capacity

As reviewed last January (see ISO New England Gambling with Natural Gas) when the ISO released its Operational Fuel Security Analysis, it did not really expect expansion of import capacity for natural gas into the region in the near future. The report showed pipeline import capacity of 3.86 Bcf/d and an additional 2.04 Bcf/d of LNG import capacity. Algonquin import capacity has been at or near capacity all summer as can be seen in Exhibit 2. While the Labor Day weekend had plenty of open capacity from Canada, the supply needed for generators did not come until the Tuesday after, due to the holiday weekend. So, while generation capacity is being added, the access to natural gas is far from guaranteed. Strong environmental opposition in the region is hampering the addition of pipeline capacity and raises questions about whether natural gas is a good alternative to replace the retiring coal, petroleum, and nuclear plants.

Exhibit 2 Algonquin Capacity and Flow Volume at ISO New England Border



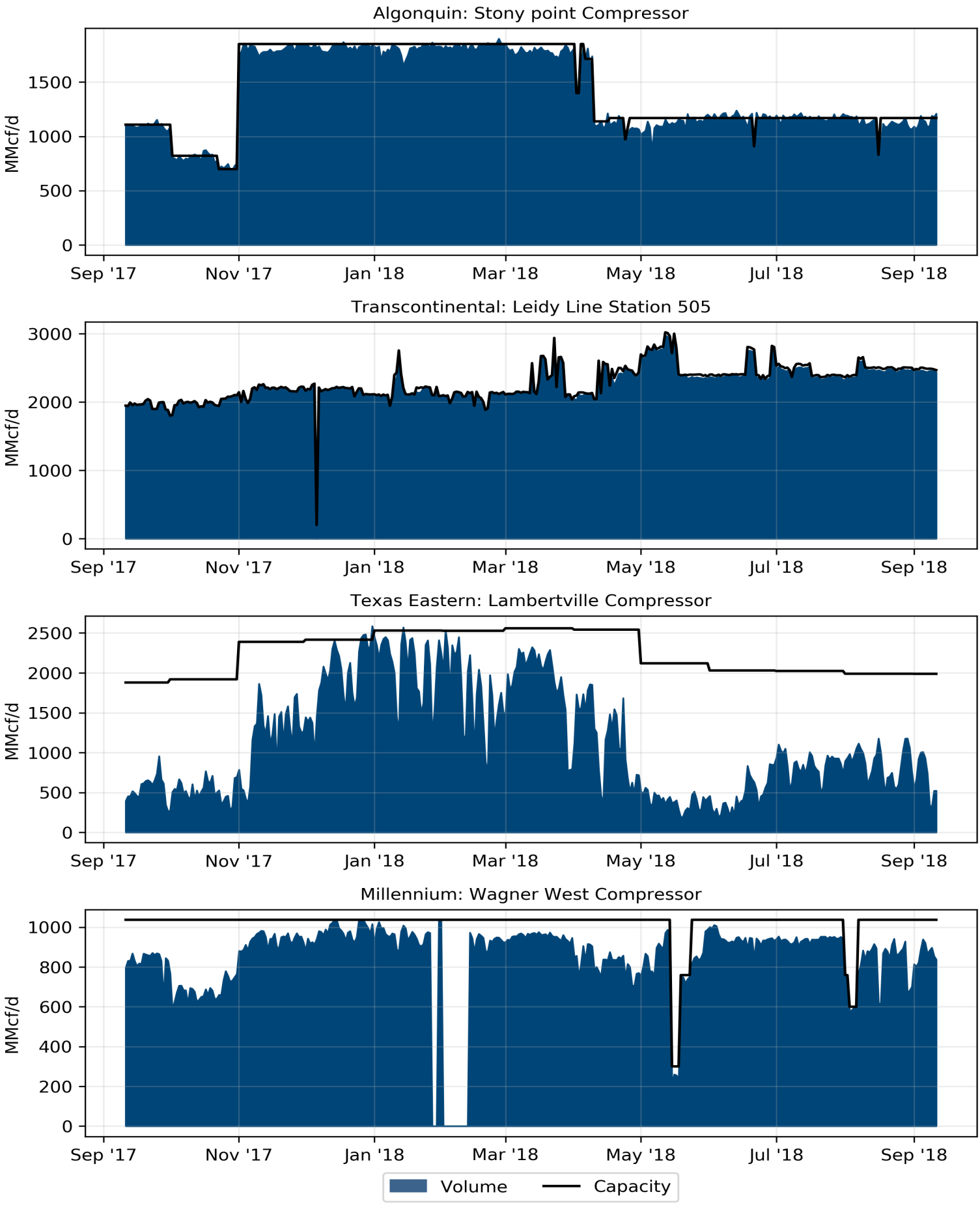
Source: Point Logic

Portents for the Future

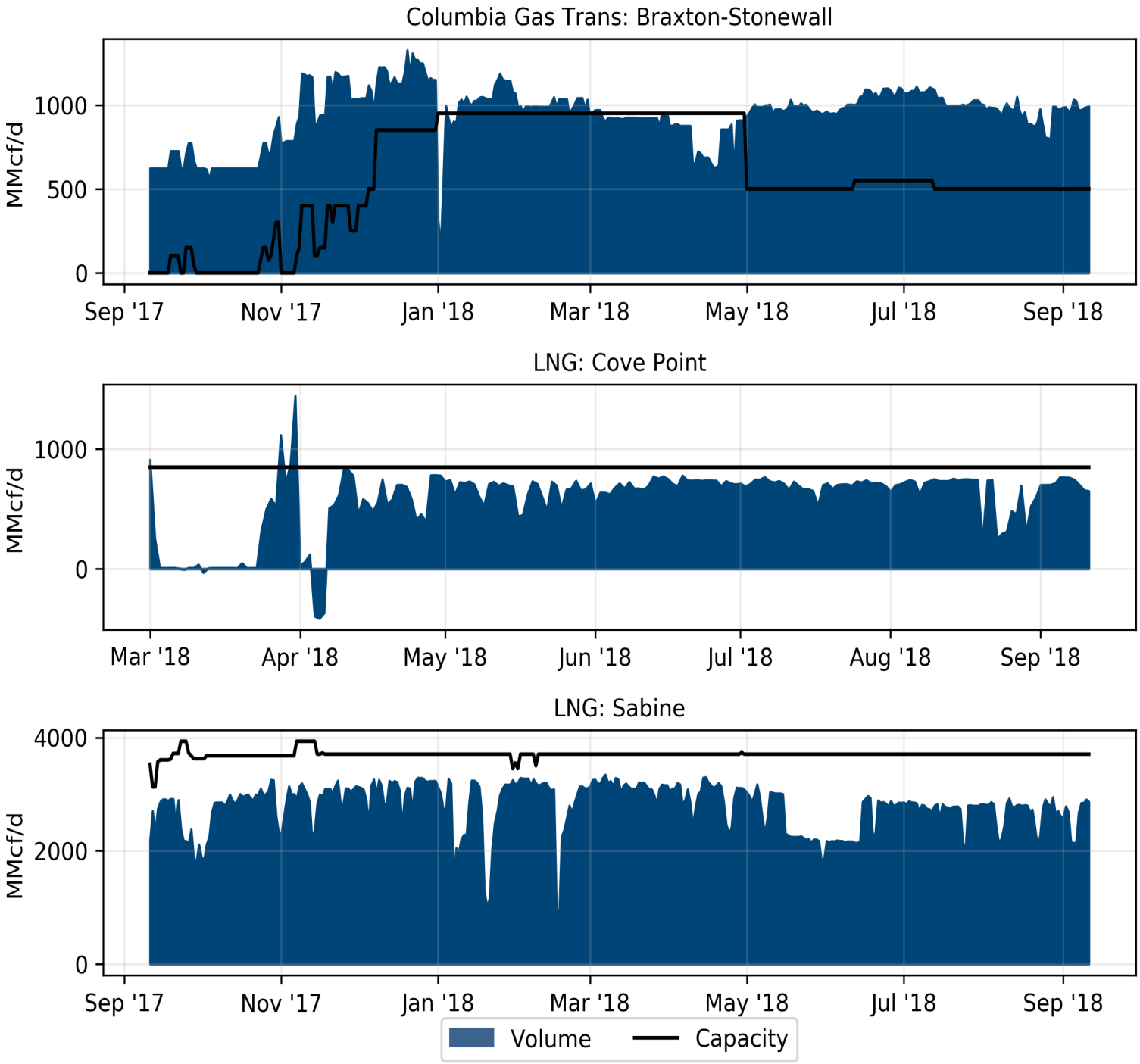
The Labor Day spike showcased New England's need to address its reserve supply deficit until it finds sufficient realistic replacement generation assets. If New England has to resort to emergency procedures in conditions slightly above normal load amid an outage at Pilgrim that is going to become permanent next year, there is cause for concern if further retirements occur before adequate replacement generation is installed. Saving older fossil fuel and nuclear plants does not seem to be a good answer as these become increasingly unreliable. The region is already highly dependent on natural

gas and that fuel is highly sensitive to supply chain disruptions, leaving that a questionable answer as well. Given new nuclear, coal, or natural gas pipeline capacity currently face too many hurdles, the alternatives are limited. One possibility would be to explore expanding its regional profile to New York to gain flexibility in the same vein of CAISO's EIM. Faster adoption of solar and wind renewables with storage would have helped as well with sunshine and wind plentiful on the day. Regardless, in the end, the region's small supply stack profile leaves it vulnerable to more frequent emergency procedures bringing its reliability needs to the forefront.

Natural Gas Important Points



Source: Pointlogic Energy



Source: Pointlogic Energy

About Morningstar® Commodities Research™

Morningstar Commodities Research provides independent, fundamental research differentiated by a consistent focus on the competitive dynamics in worldwide commodities markets. This joint effort between Morningstar's Research and Commodities & Energy groups leverages the expertise of Morningstar's 23 energy, utilities, basic materials, and commodities analysts as well as Morningstar's extensive data platform. Morningstar Commodities Research initially will focus on North American power and natural gas markets with plans to expand coverage of other markets worldwide.

Morningstar, Inc. is a leading provider of independent investment research in North America, Europe, Australia, and Asia. The company offers an extensive line of products and services for individuals, financial advisors, and institutions. Morningstar's Commodities & Energy group provides superior quality market data and analytical products for energy data management systems, financial and agricultural data management, historical analysis, trading, risk management, and forecasting.

For More Information

+1 800 546-9646 North America
+44 20 3194 1455 Europe
commoditydata-sales@morningstar.com

22 West Washington Street
Chicago, IL 60602 USA