

COVID-19 Crisis Electricity Demand Destruction

Focus on NY

March 25, 2020

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Scoville Risk Partners (SRP) is providing electricity demand destruction updates derived from hourly historical demand (load) data. All results are weather-normalized and de-trended; a simple comparison of year-on-year changes can yield spurious and erroneous conclusions. The difference between a relatively hot July with high AC consumptions versus a cool July can easily exceed 10% of expected monthly usage. In addition, in many regions peak loads have sustained systematic declines with increased energy efficiency and behind-the-meter renewables generation. Our methodology (described in more detail at www.scovilleriskpartners.com) is designed to remove, or at least minimize, such effects without over fitting. As a consequence, there can at times be significant day-to-day fluctuations, but our goal is to discern systemic changes as quickly as possible.

This effort is motivated by our research on the 2009-2010 load collapse which witnessed a drop in consumption in excess of 10% on a monthly basis relative to normal^[1]. These unprecedented changes in demand were a tangible metric of the severity of the economic impact of the credit crisis. Our original analysis was done in arrears -- a post-crisis retrospective. Our intention here, in contrast, is to track departures from normal on a daily basis, providing metrics of economic dislocation that may serve as leading indicators of subsequent economic data releases, renewable energy prices and of the financial impact on retail energy providers.

Here we will focus on what we consider to be noteworthy developments (more expansive statistical results are available on our website). To this end we start at what is currently viewed as the epicenter for the COVID-19 crisis in the U.S., namely the NYC area. Figure 1 shows monthly departure of electricity consumption in NYC (NYISO Zone J) as published by NYISO over the entire data set (March is a partial month). The horizontal green lines show one standard deviation of the typical variation from normal. March has sustained slightly over a 4% shortfall.

Figure 2 shows similar, but far more striking results at the daily level. The past several days have seen remarkable falls from normal consumption, with the last day (March 24) approximately 15% below normal. If such decreases in consumption continue the impact will far transcend that of the credit crisis.

A question that is circulating among market participants is the extent to which demand destruction is reverberating through the rest of the NYISO. To this end Figure 3 shows similar results for the entire NYISO system (all zones). The system-wide drop is clearly visible, though this is certainly affected by the NYC dynamic. To exclude this effect we constructed a "Non-NYC" index which includes Zones A through I; that is excluding NYC in addition to Zones G (Hudson Valley) and K (Long Island). This is shown in Figure 4. Here the results are more ambiguous, but also suggest emerging demand shortfall. Recent daily departures are clearly biased to the downside, with some recent days showing shortfalls well outside of the norm.

^[1] Glen Swindle. Valuation and Risk Management in Energy Markets. Cambridge University Press, 2014.

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Figure 1: Monthly NYC Peak Load Variation

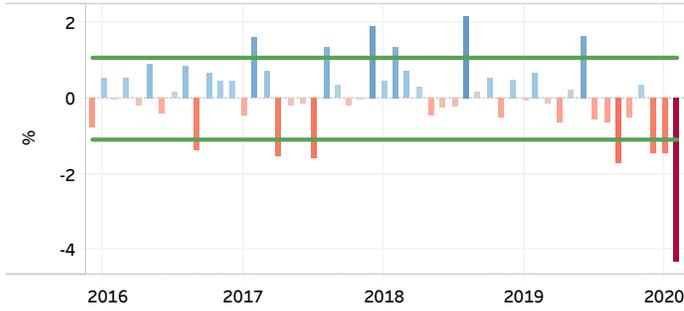


Figure 2: Daily NYC Peak Load Variation



Figure 3: Daily NY State Peak Load Variation

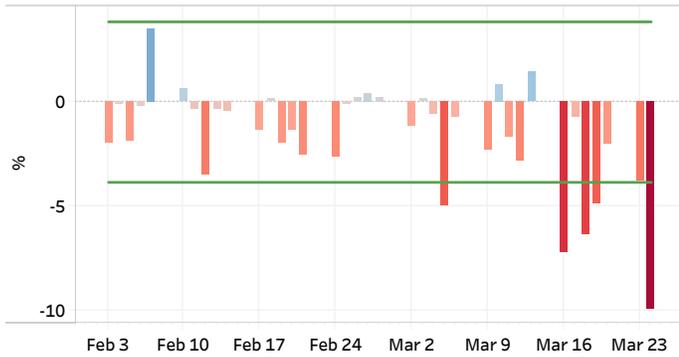


Figure 4: Daily NY State/ex NYC Area Variation

