

# The Effect of COVID-19 Work from Home Policies on Building Energy Profiles

The rapid spread of the Coronavirus (COVID-19) is upending our economies and reshaping the way we live our lives. While we can easily anticipate some corresponding actions and reactions – empty streets and economic fallout – the short and long-term impacts on the energy and natural gas industries are less certain.

This article is part of a review by David Energy of the impacts of COVID-19 on grid infrastructure and distributed energy and seeks to outline the current impacts of COVID-19 Work From Home (“WFH”) policies on energy usage from commercial buildings.

## Effects of Work-From-Home on Commercial Energy Usage

As more and more employees work from home, changing energy consumption patterns will likely lead to real changes in energy prices and modeling, particularly in a city like New York where 71% of greenhouse gas emissions are from the built environment.

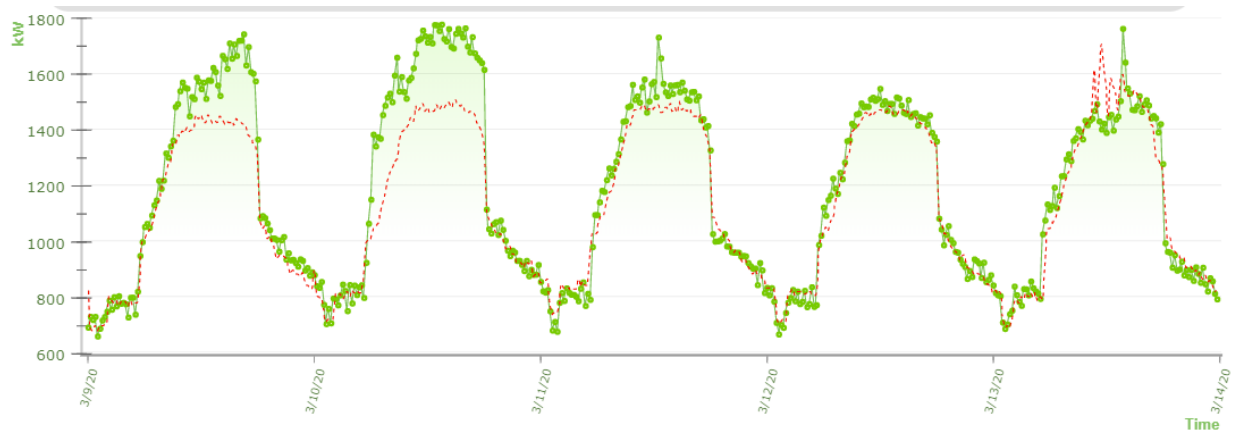
David Energy’s energy management platform Mycor tracks building energy consumption in real time. In order to show the impact of the new WFH policy on building energy patterns, we reviewed the electric demand changes of a commercial building in Manhattan connected to Mycor.

### First Week in March (3/2 – 3/6) (No WFH in Effect)



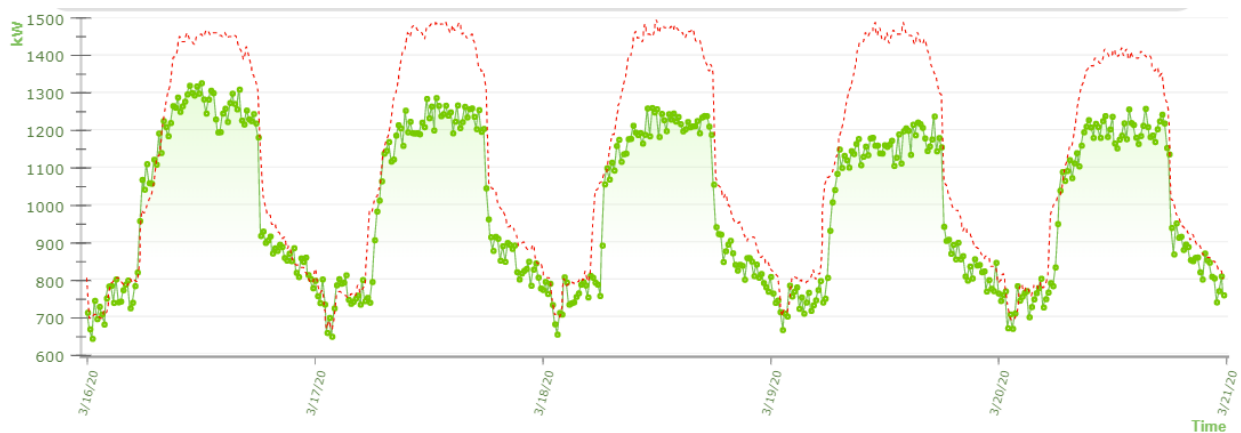
The figure above shows the demand patterns during a typical work week in early March.

### Second Week in March (3/9 – 3/13) (Voluntary WFH in Effect)



With the start of voluntary work-from-home practices, a decrease in the demand is observed during the beginning of the second week of March (March 09-13).

### Third Week in March (3/16 – 3/20) (Mandatory WFH in Effect)



During the third week of March (March 16-20), New York State and City officials enforced WFH policies and closed non-essential business, prompting property managers to seek to reduce energy consumption, and leading to an average 20-30% reduction in electric demand compared to the previous year. Some factors driving the reduction include:

- Turning off of base building HVAC systems (with resultant reduction in plug load);
- Turning down A/C in building lobbies, entrance areas, and other common spaces;
- Modified heating plant cycles; and
- Reducing lighting usage in buildings with occupancy sensors.

These measures were not universal, however, with some buildings where the tenants were fairly spread out continuing to maintain similar consumption profiles.

Seeing how WFH policies affected commercial buildings, we could safely assume that multifamily buildings will be affected as well, increasing their energy usage. Multifamily buildings experience an increase in energy consumption, with the increased plug load and heating.

## New York City & State Carbon Reduction Goals

State work-from-home policies are having measurable climate impacts, with scientists reporting steep drops in carbon emissions (due largely to the reduction of vehicular traffic).<sup>[1]</sup> While this reduction in air pollution will have positive short-term health benefits, the (hopefully) short-term duration of the pandemic means such reductions are unlikely to contribute significantly to New York's goal of an 85% reduction in greenhouse gas emissions by 2050.<sup>[2]</sup>

### NYC LL84 & LL33 (Energy Benchmarking & Energy Efficiency Laws)

Local Law 84 (NYC Energy and Water Benchmarking) requires applicable buildings to submit energy reports by May 1st of each year. 2020 reports will also form the basis for entirely new public energy efficiency 'grades'. Similar to the restaurant grading system, each building will now be required to post their grade label (A to F) on exterior doors.

Energy efficiency grades are determined per EPA's Energy Star scores by using EPA's Portfolio Manager tool.<sup>[3]</sup> Since 2020 labels and grades will be determined based on buildings' 2019 performances, this year's labels will not be affected by WFH. We will see effects of work from home policies on 2021 Energy Labels, however. Based on the trends observed so far, we can predict that decreased energy consumption in commercial buildings might lead to an increase in their Energy Star scores, with the opposite trend for multifamily buildings.

### NYC LL97 (Building CO2 Emissions Caps)

Local Law 97, which has been the subject of significant concern by property owners, requires many buildings over 25,000sf to reduce their GHG emissions to specific caps or be subject to significant monetary penalties.

Unfortunately for property owners, while WFH policies will reduce the overall building intensity for many buildings, the first reporting year will only be in 2024, meaning that any reduction in 2020 will not impact the baseline year of 2024.

On the other hand, the office culture as we know it is being challenged as non-essential workers are urged to work from home during this time. Depending on how long such policies remain in place, they might result in long-term behavioral shifts, with more and more people working from home even after quarantines are lifted. In turn, this could certainly change demand for commercial building energy consumption, which would also change greenhouse gas emission patterns.

# Energy Markets

## Capacity Charges

Large commercial off-takers are subject to energy capacity charges. Wholesale regulators use these capacity ‘tags’ (based on previous year’s usage) to ensure the system has enough supply for all users at peak times.<sup>[4]</sup> However, if commercial building consumption is reduced enough due to work-from-home policies, their 2021 capacity tags could also reflect artificially lower usage. While this would have an obvious benefit of reducing costs, it could also make it more difficult for wholesale regulators to accurately assess true system peak needs.

## Natural Gas and Electricity Markets Overview

We expect a major shakeup in energy markets. Despite a corresponding increase in residential demand that somewhat offsets the drop in commercial demand, we have seen a major decrease in energy usage because of the overall decrease in economic activity. Energy suppliers typically buy energy in advance for customers, and don’t expect such rapid changes in demand during shoulder season (the time between spring/summer and fall/winter when we switch from heating to cooling). This has led to a sharp decrease in energy prices, which is putting extreme pressure on some of these suppliers as they look to sell their now excess supply.

Similarly, through the end of March and into April, the natural gas market experienced all-time lows, with many traders maintaining the bearish outlook that potentially lower prices are still to come. Oil prices, however, rallied in early April on supply cuts, suggesting, if nothing else, to expect the unexpected. And for the upcoming summer months of June-August, the U.S. EIA Short Term Energy Outlook Report issued in April is forecasting electricity consumption to drop 5%, as temperatures are projected to be cooler than 2019.

## Long-Term Effects of COVID-19 on Energy Consumption

The COVID-19 pandemic is affecting every aspect of our lives, including our energy systems. It is causing observable declines in commercial building energy usage, with likely corresponding increases for single and multifamily residential dwellings. It is contributing to wild price fluctuations in fossil fuel and electricity pricing, and will have impacts on energy compliance for 2021.

More importantly, we are experiencing life in ways we never had to before. Even after states lift “social-distancing” and “work from home” mandates, we will likely continue to feel their effects if more companies adopt remote offices and meetings, impacting commercial energy management as well as changes in when and where we use the most energy. David Energy remains committed to helping commercial and industrial owners navigate in this unprecedented time.

<sup>[1]</sup> <https://www.greenbiz.com/article/stunning-impact-covid-19-social-distancing-air-pollution>

<sup>[2]</sup> Climate Leadership and Community Protection Act (CLCPA).

<sup>[3]</sup> On March 27th, EPA announced that their team is working on assessing the impacts of the new occupancy and usage patterns on Energy Star scores and they will provide details and guidance for proper benchmarking in the coming weeks.

<sup>[4]</sup> Capacity charges are based on consumer's Peak Load Contribution (PLC) (calculated by selecting the peak hour – or top 5 peak hours – of usage from the previous year.