



EXPLAINER

Impact of National & Global Conditions on

Electricity Prices in New York



Introduction

Fossil fuel costs have risen dramatically in the past year due to economic factors rooted in the pandemic and amplified by the Russian invasion of Ukraine. Spiking global demand for fossil fuels, lagging supply, and global instability caused by war, have combined to bring fossil fuel prices to historic high levels. While consumers might expect these conditions to impact the cost of gasoline, many have been surprised by the degree to which these fossil fuel prices have found their way into electricity bills as well.


That's because the power grid does not operate in isolation. **The competitive wholesale electricity markets in New York are heavily influenced by national and global fossil fuel markets.** The same economic and geopolitical factors that are causing volatility in oil and natural gas markets nationally and globally ultimately affect wholesale electricity markets as well. These conditions impact the costs to produce electricity, which ultimately are reflected in wholesale electricity prices and in supply charges seen in consumer bills.

Below, we take a closer look at how we've arrived at our current situation.

The Covid-19 Effect

The impact of Covid-19 on all aspects of society was profound, unexpected, and sudden. Restrictions put in place to slow the spread of the virus resulted in a rapid decline in economic activity across the globe, including here in New York state. People drove and flew less. Many people began working from home, while others were unable to continue working altogether. Immediately, electricity consumption patterns began to shift and change, and overall energy consumption was reduced significantly. In fact, fossil fuel consumption diminished globally to the point that, for the first time in years, the world actually saw a temporary decrease in greenhouse gas emissions with global carbon dioxide emissions dropping more than 6% in 2020.¹

On the grid, New York saw the average daily load, or demand for electricity, decline by nearly 4% in 2020 compared to 2019. With reduced demand for all forms of energy, fossil fuel costs dropped, and electricity market prices declined as well. In fact, wholesale electricity markets in New York produced record low prices for electricity in 2020.²

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As COVID restrictions eased and parts of the world began to return to normal in 2021, demand for energy began to rise as well. This was particularly visible with the industrial and commercial sectors, which accounted for nearly 40% of natural gas consumption in the United States, according to the U.S. Energy Information Administration.³

The energy industry is inherently risk averse as warranted by the imperative to maintain system reliability. It also is a capital-intensive sector, requiring upkeep, maintenance, and investment in new facilities. Rapid and unexpected changes in demand, as we saw with the onset of COVID-19 restrictions, are disruptive and create market uncertainty. This uncertainty caused investors to pull back on plans for expanding energy supplies and infrastructure. The subsequent rapid rebound in demand associated with increasing economic activity in 2021 outpaced the industry's ability to ramp production up again, resulting in tighter supplies that caused prices to rise.

In 2022, the industry is still catching up.

Inflation Factor

The current national inflation rate is the highest it's been in nearly 40 years, according to the U.S. Bureau of Labor Statistics. The Bureau reported that the Consumer Price Index for January 2022 increased 7.5% from the previous year (before seasonal adjustments), with monthly reported increases this year peaking at 9.1% in June before falling back to 8.5% in July.⁴ The CPI reflects spending patterns for each of two population groups: all urban consumers and urban wage earners and clerical workers, and reflects prices of food, clothing, shelter, fuels, transportation, medical services, drugs, and other goods and services that people buy for day-to-day living.⁵

What causes inflation?

Generally, it is when demand outstrips supply. Factors include many caused by the pandemic, such as supply-chain issues and the higher demand for commodities. Other costs in society are also rising because of inflationary pressure, such as rent, gasoline, food, and used cars.

Electricity supply costs are no different. Natural gas is a key fuel for producing electricity and is subject to many of the same economic influences that result in higher inflation.⁶ In January 2022, natural gas prices were up 279% as compared to a year earlier because of a combination of domestic and international pressure.⁷

Higher fuel costs have led to higher average wholesale electricity prices as well. In February 2022, the average year-to-date wholesale electricity cost was \$118.36/Megawatt-hour (MWh), according to NYISO data. That was a 123% increase from a year earlier.⁸ Through July 2022, the average year-to-date wholesale cost for electricity declined to \$90.31/MWh, which represents an increase of 115% over July 2021 average year-to-date wholesale electricity market cost data.⁹



In preparing for the summer high-demand season, the NYS Department of Public Service reported that higher electricity commodity prices were likely to significantly impact customer bills. DPS staff noted that average electricity bills, inclusive of commodity and delivery charges, were likely to approach \$200/month for the summer season, a level not seen since 2014.¹⁰

New York Public Service Chairman Rory Christian:

“**The price spikes we’ve recently seen are not something limited just to New Yorkers. This is a global issue, a national issue, and it’s affecting everyone from Maine to California.**”¹¹

Ukraine Conflict

The war in Ukraine has roiled already-strained global oil and natural gas markets, adding to the challenging economic factors already at play.

The U.S. has banned Russian oil imports to this country, and talks continue about whether to increase embargoes worldwide against Russian oil and gas.

Due to this volatility and uncertainty, the European Commission forecasts that gas and electricity prices will “remain high and volatile until at least 2023.”¹² About 40% of Europe’s natural gas supply comes from Russia.¹³ If further boycotts of Russian fossil fuels occur, it could drive the price of natural gas higher in the United States as well.

40%

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Longer term, global conditions such as the war in Ukraine may change how natural gas is supplied to Europe from the United States. In late March, the White House announced that the U.S. would support efforts to reduce Europe’s reliance on Russian gas.¹⁴ The announcement included a commitment to increase liquefied natural gas imports into European ports immediately, beginning with an increase of 15 billion cubic meters this year. **The announcement states that the U.S. will supply 50 billion cubic meters of natural gas to European markets by 2030.**

Historically, natural gas was largely a domestically sourced product, with a network of pipelines enabling delivery across much of North America. Following a sustained period of increased U.S. gas production stemming from hydraulic fracturing, the Trump administration moved to facilitate the export of natural gas to overseas markets. One result is that U.S. gas prices are more closely tied to global gas markets and circumstances than they have been historically.

A 2017 report¹⁵ by Center for Strategic & International Studies noted that advancements in liquefied natural gas (LNG) distribution challenged the “long-established dependence on pipelines for gas trade and in turn testing traditional gas business and pricing models.” The report suggested that U.S. natural gas exports were expected to more than double by 2022.

According to the EIA, 2021 total annual exports of natural gas from the U.S. were the highest on record.¹⁶ The EIA also reports that, in the first half of 2022, "the United States became the largest LNG exporter in the world."¹⁷ With these circumstances creating upward pressure on natural gas prices, we can expect similarly sustained high prices for electricity as well. The EIA reported that natural gas price volatility, which is a measure of how much daily prices change, "reached the highest levels in 20-years in the first quarter of 2022 in the United States." EIA data indicates that the 30-day historical volatility of U.S. natural gas prices average 179% in February as compared with the five-year (2017-21) average of 48%.¹⁸

Heading into this summer, the EIA projected that "the price of natural gas delivered to electric generators to average \$8.81/MMBtu this summer, up from \$3.93/MMBtu last summer."¹⁹ Actual prices, according to the EIA, averaged \$7.28/MMBtu, down from \$7.70/MMBtu in June and \$8.14/MMBtu in May.²⁰ The EIA is projecting similar price levels for natural gas through 2022.²¹

Driven by international conditions and forecasted winter demand, published NYMEX electricity price futures for this winter have increased four-fold over last year, with prices averaging near \$200/MWh.²² These futures prices are driven by natural gas futures prices for the upcoming winter, which are more than double current pricing levels to nearly \$20/Mbtu.²³

Minimizing Costs Through Competitive Markets

Since 1999, when wholesale electricity markets were established in New York, consumers have seen considerable benefits.

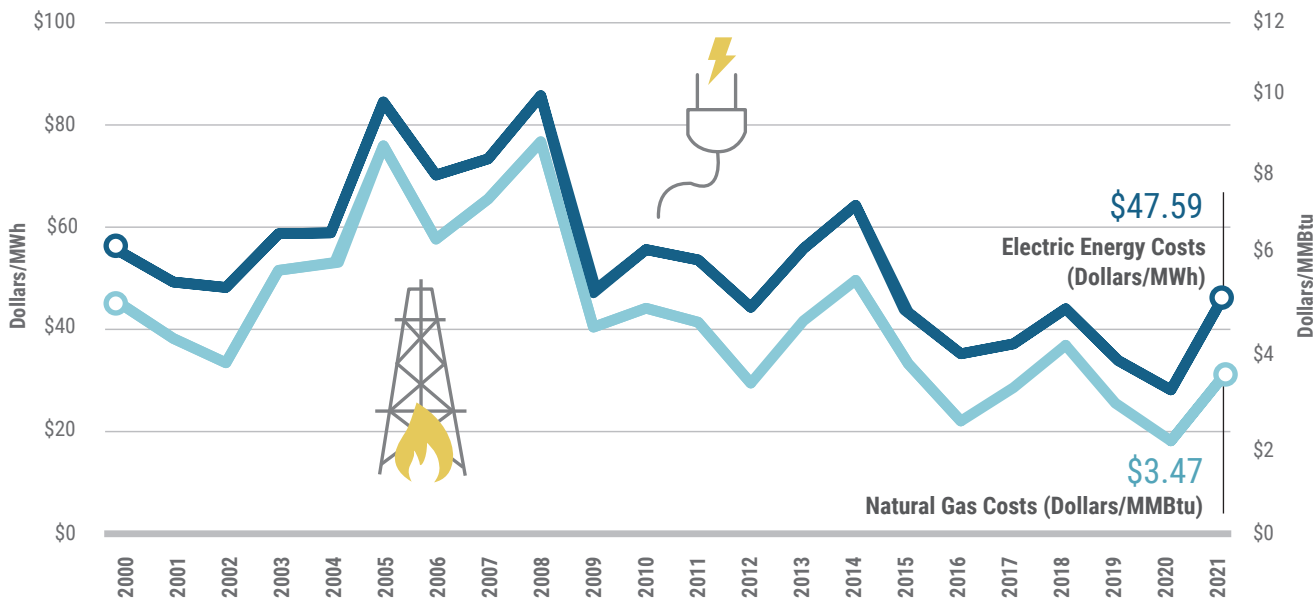
Wholesale energy markets in the U.S. use a competitive auction structure to establish the cost of energy. In this structure, generators consider their fuel and other operational costs in offering their supply to the market. Those with lower costs enable suppliers to offer into the market at lower prices and fluctuations in the costs for fuel will influence generators' offers.

The NYISO calculates the price of electricity by determining the expected demand and evaluating numerous supply offers to meet that demand. These offers are ranked by cost from lowest to highest, with the NYISO's market software selecting the least costly resources first, and then continuing to select supply resources until the total demand is met. All selected suppliers receive the price set by the last supplier needed to meet demand – this is known as the clearing price.



A key element of the market design is that it enables actual costs, including fuel costs, to be accounted for in the clearing price for electricity. **As a result, while the competitive market works to minimize cost, electricity prices are significantly influenced by fuel costs and these costs are ultimately passed through to customers in the electricity supply component of consumer bills.**

» The Link Between Natural Gas and Wholesale Electricity Prices



Impact of Global Uncertainty on Local Electricity Costs

The energy grid in New York is a complex machine, with many moving parts. Competitive electricity markets work to continuously tune that machine through wholesale price signals that encourage suppliers to minimize costs through the use of less expensive fuels and power plant upgrades or replacements to improve efficiencies.

Every five minutes, every day, electricity auctions are conducted to select the least-cost mix of supply to serve New York’s electricity needs reliably. As the chart above shows, these markets have encouraged a steady decline in costs. While competitive electricity markets deliver least-cost supply to consumers, the chart also illustrates how closely tied electricity prices are to the price of natural gas, the primary fuel used for power generation in New York state. Whenever the price of natural gas rises, we see a corresponding increase in electricity prices.

With that strong link between natural gas and electricity prices, it becomes easier to see how global events impact local electricity prices.

While the NYISO saw record low prices for wholesale electricity in 2020, 2021 brought a rebound in the demand for energy that was reflected in electricity markets. The daily demand for electricity in New York grew by nearly 1.5% in 2021. Combined with higher fossil fuel costs throughout 2021, the average wholesale price for electricity climbed from a record low average price of \$25.70/MWh in 2020 to \$47.59/MWh a year later.²⁴

As the calendar turned to 2022, cold weather and seasonal demand for fossil fuels to meet heating needs added to existing demand for power generation, creating additional upward pressure on prices. The average wholesale cost of electricity in New York’s markets more than tripled from January 2021 to January 2022: from \$40.69/MWh to \$137.49/MWh.²⁵

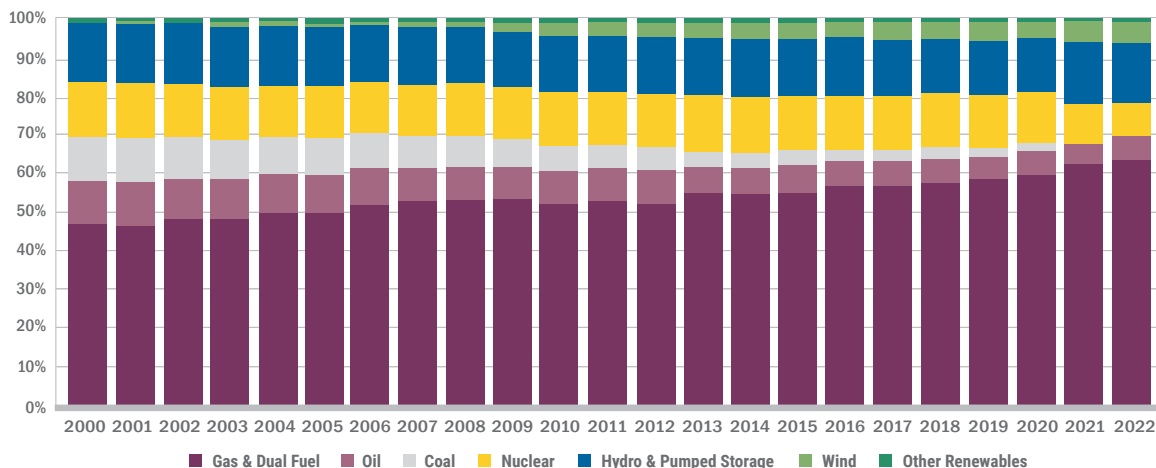
Transitioning from Fossil Fuels

In New York, we face a state mandate to move to a 70% renewable energy grid by 2030 and an emissions-free grid by 2040. **Until there are enough clean energy resources on the grid to replace the reliability services provided by fossil fueled generation, natural gas must continue to play an important role in meeting energy needs in New York and maintaining system reliability, which supports the health, safety, and welfare of New Yorkers.**

Over the past 20 years, the U.S. has increasingly relied on natural gas for power generation, in place of fuels like coal or oil, which emit greater amounts of greenhouse gases. In fact, natural gas generating technology has advanced significantly in recent years to become cleaner and more efficient, helping to drive down emissions while also providing reliable supply during our transition to increasing supply from carbon free resources like wind and solar.

In 2000, the U.S. consumed 5.2 trillion cubic feet (TCF) of natural gas for the purpose of generating electricity. In 2020, that number rose to 11.62 TCF, according to the EIA.²⁶ For much of this time-period, natural gas was plentiful, relatively inexpensive, and considered much cleaner than coal, the use of which fell during that period.

» Fuel Mix Trends: 2000-2022



In New York State, we've seen these trends play out. **The chart above shows that, since 2000, electric generators that primarily combust natural gas increased from less than 50% to more than 60% of the generating capacity in the state. That transition towards natural gas contributed to the complete phase-out of coal-fired generating capacity from the grid during this time frame.**

Competitive markets have over time created pressure on the generating fleet to switch to newer, more efficient generation plants. Emissions from the electric sector declined and prices generally followed.

It is important to note that generating capacity is not the same as energy production. While fossil-fuel-fired generating capacity grew to more than 60% of total generating capacity, historically these facilities produced less than 50% of the electricity supplied to the grid. That's because the market design selects resources with lower or no fuel costs before fossil fuel facilities, based on their lower costs.

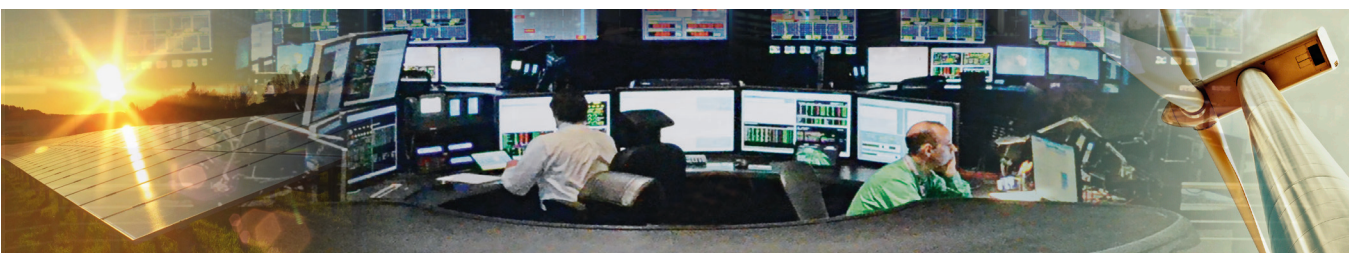
The Future of Electricity

The grid of the future will look very different than it does today. New York is currently building much needed transmission that will increase the delivery of greener energy from upstate resources to high population centers in New York City, Long Island and Westchester.

The power supplying the grid increasingly will come from renewable resources. Battery storage will grow to help balance the intermittency of wind and solar. But NYISO [studies](#) suggest that intermittent and storage resource technologies will not be capable of supplying the grid reliably on their own. They will need to be supplemented by power generation technologies that can meet the objectives of clean energy public policies while being able to be dispatched on demand and capable of operating for time-frames ranging from hours to days or even weeks.

In the future, these capabilities may be provided by clean fuels like hydrogen or renewable fuels. But we haven't arrived at the grid of the future just yet. The grid remains in transition. As such, reliability will likely depend upon fossil fuels — and reflective of the costs for those fuels — during our march toward a fully decarbonized electric system.

The NYISO is committed to maintaining open, transparent, and competitive markets that deliver the least-cost electricity supply available to consumers and while we can't control the many factors that have caused prices to rise through our competitive energy markets and planning processes, we can help get the best electric prices possible for energy consumers.



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