America's Electricity Affordability and Reliability Crisis

Americans Are Feeling the Pinch

Americans are feeling the pinch of soaring prices at the gas pump, heightened by the immediacy and transparency of seeing more money coming out of their pockets every time they fill up.

However a far less apparent energy vulnerability is emerging with the potential to be more damaging to our economy and harmful to family finances. Rising fuel prices for electricity generation and a loss of fuel diversity are exposing Americans to the same kind of pain once confined to the gas pump. Specifically, our nation's abandonment of coal generating capacity is robbing regions of the country of readily available fuel diversity that has long worked as a price buffer to natural gas price volatility. While natural gas prices currently remain steady, they nearly doubled in 2021. Further, gas exports are soaring, exposing a once isolated U.S. natural gas market to the pressures of higher prices from overseas.

Renewable energy proponents point to solar and wind power as an answer to meeting this energy challenge, but the pivot to variable power raises more questions than it does answers. The costs and challenges of integrating renewable sources of power are growing, not decreasing. With U.S. electricity demand poised to jump, affordability and grid reliability are increasingly resting on shaky ground. The recent disasters in California and Texas, coupled with warnings from regional grid operators and regulators and the ongoing energy crisis in Europe, all point to the need for an immediate course correction in energy policy.

Energy Affordability Concerns Are Up

According to polling from Morning Consult, 85% of Americans are worried about rising energy prices, with 50% very concerned. This trepidation cuts across party lines, with 85% of Democrats concerned and 89% of Republicans.

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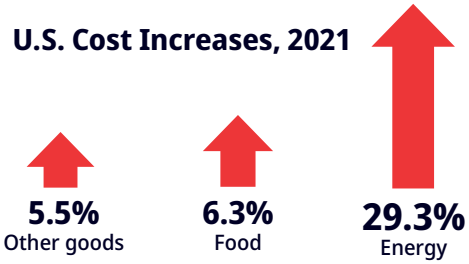
> ***– Morning Consult poll***

Energy-driven inflation, reaching 7% in January, adds to the challenges of our attempts at economic recovery and is already placing a heavy burden on American consumers that can least afford it. According to the Bureau of Labor Statistics' Consumer Price Index, the cost of food is up 6.3% over the 12 months ending in December 2021 with the cost of all other goods, less food and energy, up 5.5%. The cost of energy is up a staggering 29.3% in the same period.



Bureau of Labor Statistics' Consumer Price Index

According to U.S. Energy Information Administration (EIA) analysis, nearly a third of American homes struggle to meet energy needs, with 7 million American households reporting occasions when they have been unable to use heating equipment for financial reasons. This pain is particularly acute for elderly and minority households.

44 million

The number of U.S. adults in households unable to pay an energy bill in full last year

Dispatchable Fuel Diversity Underpins Affordability

To state the case plainly, a lack of energy diversity leads to fuel shortages during spikes in demand, causing massive price increases and greatly increases the potential for disastrous power outages. The problem grows more pernicious over the long-term, with demand for energy showing a steep upward curve in the next few decades. Failure to address this lack of fuel diversity is not an option. It must be prioritized with an urgency that rises above political or ideological agendas.

We note, the wholesale spot price for natural gas nearly doubled in 2021 to an average of $3.89 per million British thermal units (MMBtu), according to the Henry Hub (the U.S. benchmark for natural gas prices), driving up home heating and electricity prices across the country. The EIA warned that a colder than expected winter could result in a 50% hike in electric bills this year—in some states the increase has been ever higher.

Utilities are clamoring for rate hikes just to survive. The Wall Street Journal has reported, "Utilities from the Pacific Northwest to New England have filed regulatory requests to raise rates for natural gas this winter, citing a supply squeeze as a result of higher global demand."

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Regions of the country most dependent on natural gas generation will feel this pain the hardest. In New England, wholesale electricity prices are already up 50%. In Maine, the Public Utilities Commission has already warned that natural gas prices and grid modernization investments will drive up overall electricity rates across the region over the next few years in addition to the 30% rise in electricity rates that began January 1. Even in Florida, power prices jumped at the start of the year by 20%, with Florida Power and Light pointing to natural gas prices as the primary culprit.

Conversely, areas of the U.S. with a more diverse fuel mix are not suffering the same fate. Coal picked up market share in 2021, shielding consumers from the full brunt of rising gas prices.

Analysis from the U.S. Chamber of Commerce's Global Energy institute revealed considerable fuel switching and a resurgent year for thermal coal. The institute explained, "The main factor is economics. Since bottoming out in the middle of 2020, natural gas prices have steadily risen over the last 12 months, leading many utilities to shift back to coal as a lower-cost fuel source."

In June, coal generation on the PJM grid, the nation's largest, hit a three-year high. Coal demand on the Midcontinent Independent System Operator (MISO) grid rose 37% and 42% in Southwest Power Pool (SPP) territory. When demand spiked on some of the hottest days of the year, (e.g. August 13), the importance of the coal fleet was on full display. On the PJM grid, coal provided a third of generation; on the SPP grid, nearly half; and on MISO, which covers most of the Midwest, more than half, totaling nearly 41 GW of power.

Fuel diversity proves again to be the key to a secure, reliable and affordable supply of power. According to a study from IHS Markit in 2017, the nation's diverse mix of resources lowered the cost of electricity production by around $114 billion per year and reduced the variability of monthly consumer electricity bills by around 22%.

Since the completion of that study, much of that fuel diversity is now gone while natural gas price volatility has made a troubling reappearance.

Lack of Fuel Diversity in Europe: The Example NOT to Follow

The European energy crisis is a product of failed policy that dismantled fuel diversity while speeding to a renewable energy future bridged by an increasingly volatile and insecure natural gas market. Driven by soaring natural gas prices and the unfortunate unavailability of renewable power at key moments, European wholesale electricity prices have jumped 300% since last winter. In the 4th quarter of 2021, the International Energy Agency reported that average European wholesale prices were more than four times their 2015-2020 average.

European Price Shock

300% **increase in European wholesale electricity prices since last winter**

54% **higher energy costs for European households than two years ago**

1.5M **U.K. households expected to be in fuel poverty**

European households are set to pay an average of 54% more for energy than they did two years ago, according to Bank of America. The average European residential consumer will spend 1,850 Euros ($2,095) on energy this year, up from 1,200 Euros in 2020, despite robust government assistance to curb price hikes. One and a half million households in the U.K. alone are expected to be pushed into fuel poverty, meaning they won't be able to afford to heat their homes to a livable temperature because of higher prices.

By closing coal and nuclear power capacity, Europe has left itself increasingly dependent on Russian natural gas, a constrained liquified natural gas market and weather-dependent renewable power. As natural gas prices have spiked, European utilities and consumers—lacking the options provided by fuel diversity—have been forced to pay up to keep the lights on and homes warm.

U.S. Grid Reliability is Deteriorating

The North American Electricity Reliability Corporation (NERC) concluded 2021 with a long-term reliability assessment warning that capacity retirements and the rapid remaking of the grid will pose significant challenges to grid reliability over the next decade. NERC's assessment came just weeks after a winter reliability preview that warned grids across the country could face the threat of blackouts from a prolonged deep winter freeze. These warnings from NERC come in the wake of grid catastrophe in Texas in February of 2021, rolling blackouts in California, and deeply troubling reliability assessments from grid operators stretching from New England and New York to the Southwest.

NERC expressed particular concern over fuel assurance and the need for operators to have "adequate dispatchable, fuel-assured, and weatherized generation, at their disposal." In addition, the authors recommended developing polices that "maintain a sustainable and diverse generation mix."

If NERC's reliability assessment sounds like a direct response to the grid catastrophe in Texas that left millions of households without heat and power, took hundreds of lives and inflicted tens-of-billions in economic damage, it should come as no surprise. NERC's Director of Reliability Assessments and System Analysis told reporters that the energy crises in California and Texas "should serve as a wake-up call for the rest of the country."

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> *- John Moura, NERC's director of reliability assessments and system analysis*

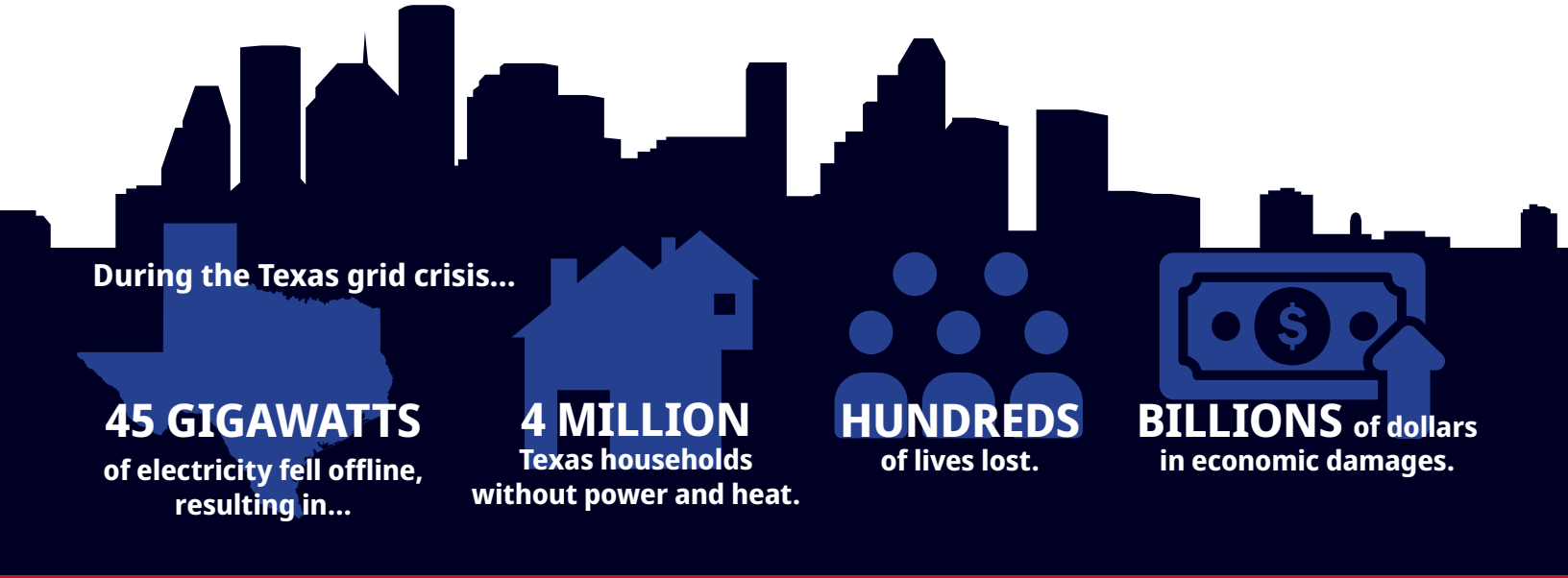
NERC's concern over maintaining a diverse, fuel-assured and winterized electricity mix is borne out of lessons learned from the disaster in Texas. Analysis of that grid failure found that while no fuel source came out of the crisis without challenges, the natural gas system performed particularly poorly.

The Challenge Beyond Texas

ISO New England, the region's grid operator, has been warning for years of fuel security challenges and market failures to address escalating reliability concerns. New England closed almost all of its coal generating capacity and finds itself overly reliant on natural gas and an oversubscribed pipeline network for power generation and home heating.

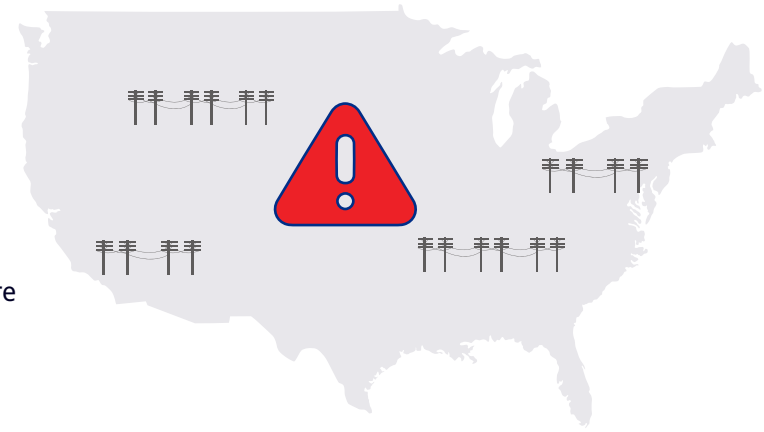
NYISO is telling a similarly alarming story about rapidly eroding reserve margins and fuel insecurity. Zach Smith, NYISO's VP of System & Resource Planning, warned, "...our reliability margins are thinning to concerning levels beginning in 2023. We have to move carefully with the grid in transition in order to maintain reliability and avoid the kind of problems we've seen in other parts of the U.S."

Further west, the situation is even worse. The Western Electricity Coordinating Council (WECC) warned that entering summer 2021, the West didn't have the generating reserves to handle a region-wide period of high demand where a heat wave, coupled with drought, could leave states at risk of blackouts for days or even months. WECC noted that not a single one of its sub-regions generates enough power to provide sufficient supply during periods of high demand; every single region relies on imports to fill the gaps and avoid blackouts. The threat of insufficient capacity region-wide with no reserves to call upon is a new, alarming reality, and California's rolling blackouts in the summer of 2020 appear to be a preview of what could lie ahead for multiple western states.



Reinforcing Reliability and Maintaining Affordability

The common thread between unfavorable affordability and reliability warnings from grids across the U.S. and the ongoing energy crisis in Europe is the loss of dispatchable fuel diversity, and the fuel security it underpins. The ongoing loss of coal and nuclear power capacity, without the addition of reliable, secure alternatives is a mistake U.S. energy policy must avoid.



Overreliance on natural gas and just-in-time fuel delivery as an energy transition bridge is proving a grave vulnerability. Fuel security challenges are becoming fuel security crises. Rising U.S. natural gas prices and the return of natural gas price volatility are leaving consumers painfully exposed to rate hikes. Dispatchable fuel diversity and fuel security are the bedrock of electricity reliability and affordability and require careful attention in the years ahead.

Principles for a Policy Reset

- **Prioritize Dispatchable Fuel Diversity:** Regulators, utilities and policymakers at the state and federal levels should act with urgency to reshape power markets or provide incentives where needed to better value a diverse, fuel-assured generating mix that can shield consumers from fuel price volatility.

- **Expand Reserve Margins:** Capacity reserve margins have been shrinking across the country when the complexities of adding variable power to the generating mix call for expanding this insurance buffer, not reducing it.

- **Value Fuel Security:** In grids across the country, the fuel security provided by coal and nuclear generating capacity is taken for granted and market mechanisms either don't exist or are inadequate to maintain fuel assurance. Efforts should be made to reshape capacity markets to better value fuel-secure generation from existing generating capacity and to encourage the addition of natural gas generation with firm fuel contracts.

- **Recognize Technology and Infrastructure Limitations:** Renewable mandates are accelerating despite deep concerns over the speed at which new interstate transmission infrastructure can be completed and long-duration energy storage can be brought to market. Renewable energy mandates appear to be out-of-sync with technology and grid reality.

- **Build in Addition to, Not in Place of:** With power demand set to grow driven by electrification, and reliability concerns already approaching a tipping point, competitive renewable energy additions should come on the shoulders of the nation's existing generating fleet, not in place of it.

Sources: U.S. Census Bureau; U.S. Bureau of Labor Statistics; Morning Consult; The Wall Street Journal; Bank of America Corp.; Maine Public Utilities Commission; Central Hudson Gas & Electric Corp.; Florida Power & Light Company; North American Electricity Reliability Corporation (NERC); Utility Dive; Argus.

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