



The transition will not be televised

Part 3 – How technology is disrupting energy consumption

In the global move towards cleaner energy, technology is moving faster than government policy. Recent technological advances in the “downstream” segment of the energy value chain are enabling consumers to take charge of their energy use in ways that are unprecedented.

In this summary of our recent paper **The transition will not be televised – Part 3**, we highlight how consumer behavior is shifting towards higher rates of efficiency, electrification and independence from fossil fuels.

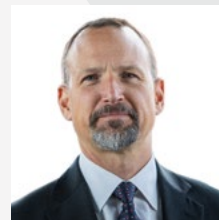
Disruption in the traditional relationship between energy producers and consumers is presenting big opportunities for a range of companies including project developers, equipment suppliers, infrastructure providers and new market entrants.

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In Part 1 of this series, we focused on changes in the ‘upstream’ portion of the clean electricity value chain, exploring the potential for accelerated growth in technologies like wind and solar.

In Part 2, we unpicked the emerging ‘midstream’ in clean power that’s using storage and hydrogen technologies to make renewables more flexible and reliable.

In Part 3, we look at how energy users in the ‘downstream’ segment (industrial, commercial and residential customers) are changing the way they buy and use energy. We describe how falling technology costs and accelerating government policies are creating new opportunities for companies at the cutting edge of shifts in US energy demand. [Read the full report.](#)



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The drivers for shifts in US energy consumption



Commodity pricing

The prevailing cost of electricity, relative to natural gas, gasoline or heating oil, has a clear influence on whether consumers switch from fossil fuels. For most US households, electricity is more expensive than gasoline or natural gas, per unit of energy.¹ With more distributed generation coming online, that is set to change.



Government incentives

One year after its enactment, the Inflation Reduction Act (IRA) has generated higher than expected uptake, leading analysts to forecast more than US\$1 trillion in tax credits over the next nine years.² As that funding works its way through the system, attention is turning to how state and local policies will influence the profitability (or indeed, feasibility) of substantial changes in energy consumption.



Consumer expectations

When it comes to making investments in energy efficiency, residential consumers are famously risk-averse.³ Large commercial energy users have meanwhile moved aggressively to invest directly in renewable power projects as a hedge against energy price volatility. Patterns of technology adoption are varying as a result.

How consumer behaviour is shifting

Energy efficiency

The cheapest unit of energy is the one you don't use. Technological changes within both power distribution systems and end-use applications are supporting new efficiency gains.⁴ Generative AI will play a significant role in anticipating the fluctuations from new sources of supply and demand.

Electrification

According to the American Council for an Energy Efficient Economy, the US could electrify about 90% of its current energy use.⁵ To make the switch, massive investments will be needed to bolster the resilience and efficiency of US electrical grids - something the IRA does little to support.

Direct power purchasing

Commercial buildings (which consume 40% of US energy) have historically drawn electricity in one direction: from the grid.⁶ Companies supplying their own needs through on-site renewable generation, green power contracts and third-party ownership are enjoying the benefits of more stable input costs over time.

1 Energy Information Administration, 2023: Sources and Uses

2 Della Vigna, Michele; Bocharnikova, Yulia, et al (Goldman Sachs), 2023: Carbonomics: The Third American Energy Revolution

3 Hassett, K.A., and Metcalf, G.E., 1993: Energy conservation investment: Do consumers discount the future correctly? *Energy Policy*. This seminal study argued that high discount rates implied by observed household decisions regarding energy conservation measures are rational responses to future uncertainty.

4 Superconductive cables are just one example. See Yahoo Finance, 14 August 2023: Prysmian's E3X Technology Added to Transmission Lines Across Northeast, Linking to a More Sustainable and Reliable Future

5 ACEEE, August 2023. *The United States Can Electrify Most Fossil Fuel Use: Here Is What Needs to Happen to Make This Possible*

6 Climate Tech VC, 2 December 2022: Buildings as Power Plants

Examples from the real economy

Residential Virtual power plants



Solar PV not only allows homeowners to generate their own power but also to become part of their own electric utility. Together, residential customers can create networks - known as virtual power plants - that increase the quantity and frequency of power generation, thereby recreating the reliability of the grid and saving billions of dollars in unnecessary traditional hardware.⁷

Commercial 'Smart' buildings



Global funding for startups that outfit buildings with 'smart' technology to improve their energy efficiency has boomed, reaching \$5.9bn in 2022.⁸ In a commercial real estate market with rising vacancy rates, buildings that better insulate tenants from volatile energy costs have a competitive advantage.

Industrial Electric boilers and smelters



Over the lifetimes of industrial equipment like boilers and furnaces, the cost of fuel is more than 10 times the initial capital investment. Given the declining relative cost of electricity, some estimate the transition to electric boilers could result in a US\$2.5 trillion savings to industry.⁹

Summary

Technology is enabling consumers to shape a cleaner and more electrified US economy. This creates vast opportunities for companies whose products and services enable the switch to clean power. While technology makes it possible to re-imagine the future of energy, urgent work is required by regulators across federal, state and municipal governments to let consumers be a catalyst for innovation.



⁷ <https://www.utilitydive.com/news/virtual-power-plant-vpp-doe-liftoff-tesla-voltus/693525/>

⁸ Memoori Research AB, 2022: Funding for Smart Building Startups Reached \$5.9 Billion in 2022

⁹ Sustainable Energy & Environmental Systems, Berkeley Lab (US DOE), November 2021: Electrification of Boilers in U.S. Manufacturing

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