

resentment abroad, making it far from clear that their public presence actually benefits China. Furthermore, every one of Zhao's tweets is flagged as coming from a "China government account," explicitly binding his vulgar speech to the government that employs him.

Indeed, modifying Section 230 as Stengel suggests, or repealing it wholesale, as former President Trump demanded as part of the National Defense Authorization Act, would undermine our ability to respond to foreign disinformation. Section 230 gives the platform internet an American flavor—its most dominant actors are American firms, playing by American rules that prioritize speech and property rights. These firms are usually friendly to American values, at least in respect to foreign adversaries. In late February, Twitter removed a network of Russian accounts for "undermining faith in the NATO alliance and its stability." Silicon Valley firms are subject to American cultural and regulatory levers and tend to take a dim view of Islamist propaganda and CCP subterfuge. The same cannot be said of WeChat, Viber, VKontakte, or any of the other foreign platforms to which conversation might flow if American firms faced a newly hostile regulatory environment.

More broadly, an American approach to combatting disinformation must not treat the First Amendment as an outdated "design flaw" to be circumvented by AI-assisted moderation or the regulation of tech firms. Instead, it will require government to move more quickly, dispense with internal veto points, and embrace an agenda-setting role for American civil society.

Although his suggestions miss the mark, *Information Wars* offers a lively report of Stengel's two-front battle against Foggy Bottom bureaucracy and foreign propaganda. Unable to set his background as a journalist aside, Stengel's account of his own tenure offers a more institution-centric perspective than most Washington tell-all's.

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A Question of Power: Electricity and the Wealth of Nations

Robert Bryce

New York: Hachette Book Group, 2020, 322 pp.

"Electricity has transformed humanity like no other form of energy," says Robert Bryce. A bold statement? Perhaps, yet he

presents a convincing, fact-driven case in his latest book. He argues that electricity is the fuel of the 21st century and the largest source of global carbon dioxide (at 25 percent). Moreover, the global economy's leaders are found in countries where electricity is abundant and reliable. The electricity-generating industry, behind the oil and gas sector, is the world's second largest industry, with total global electricity sales of nearly \$2.4 trillion.

The author of *Power Hungry: The Myths of “Green” Energy and the Real Fuels of the Future* (2010), Bryce was formerly a Senior Fellow at the Manhattan Institute, and is currently a Visiting Fellow at the Austin, Texas-based Foundation for Research on Equal Opportunity. While the author presents an interesting historical and journalistic background into the development of electricity and its infrastructure, this review will focus on the public policy aspects of his thesis.

In Part One (“Electricity Means Modernity”), Bryce notes that in 2000 the National Academy of Engineering chose “electrification” as the number one engineering achievement of the 20th century, with 13 of the top 20 achievements *directly* dependent on electrification—such as general electronic goods, computers, and air conditioning, as well as health technologies, laser and fiber optics, and household appliances. He cites several scholarly studies (including one by the U.S. government’s Energy Information Administration) verifying that increased electricity use supports economic growth. Economic growth, in turn, improves living conditions for humanity, he argues, by making lighting “cheap, abundant, and reliable,” thus fundamentally changing how people spend their days and nights. Additionally, electricity provides “instant power” that has transformed everything from manufacturing to urban transportation. Lastly, electricity gives humanity the ability to concentrate energy flows that have “shaped everything from the height of our cities to the productivity of our factories and microprocessors.” Bryce also recognizes the New Deal legislative reforms that increased energy competition and expanded access into rural, heartland America, offering consumers (and farmers) an affordable electricity grid which contributed to building America’s post-World War II economic superpower status.

In Part Two (“Why are Billions Still Stuck in the Dark? And What Are They Doing About It?”), Bryce illuminates the great disparity in electricity usage globally and why billions are trapped in

“energy poverty.” The author uses his refrigerator (running on 1,000 kilowatt hours of power) as a benchmark and creates a database of the world’s countries. He then compares per capita electricity use data with population data, gross domestic product, mortality rate, life expectancy, and religious affiliation for 2012. Next, he trifurcates the world into three categories: unplugged countries (less than 1,000 kilowatt-hours per year electricity use); low-watt countries (between 1,000 and 4,000 kilowatt-hours per year); and high-watt countries (exceeding 4,000 kilowatt-hours per year). Bryce uses 4,000 kilowatt-hours per year as the minimum level for the high-watt countries because it is considered the minimum standard for living a long, high-quality life (78 years for high-watt countries, 73 years for low-watt countries, and 62 years for unplugged countries).

The unplugged countries (such as India and the Philippines), have 3.3 billion people (or 44.6 percent of the world’s population) who are nearly a century behind people residing in the high-watt locations. The low-watt countries consist of about 2.7 billion people (or 36.7 percent of the world’s population), which include Poland, Chile, and China. The high-watt countries have the remaining 1.4 billion people, or 18.7 percent of the world’s population, and include places like the United States and Sweden.

Noteworthy, says Bryce, is that very little electricity crosses international borders. In 2013, only 308 terawatt-hours travelled between countries, while about 23,000 terawatt-hours were generated. This means that each country or region is responsible for building, financing, and managing their own electric grid. Yet, for unplugged and low-watt countries that must choose between energy poverty and increased access to electricity, both consumers and policymakers, says Bryce, will inevitably choose the least expensive form of energy available to provide the maximum available electricity to the greatest number of people, regardless of the environmental impact. This “iron law,” as explained by the University of Colorado’s Roger Pielke, is “we’re (poor countries) not going to reduce emissions by willingly getting poor. Rich people aren’t going to want to get poorer, poor people aren’t going to want to get poorer.”

Bryce argues that the world’s primary source of energy for electricity remains coal, as it is both abundant and cheap, regardless of concerns about climate change. By 2017, over 6,600 coal-fired plants with a combined capacity of 2,000 gigawatts of electricity were operating globally, with about 209 gigawatts of new coal-fired capacity

under construction by early 2018. Coal-fired power accounts for one-third of all global electricity generation, and its share of global electricity production has remained nearly constant at about 40 percent since the mid-1980s.

In Part Three (“The View from on High-Watt”), Bryce focuses on the “electricity rich,” revealing the how and why electricity demand continues to increase. Electricity is the fuel driving the “Information Age,” and the Giant Five—Alphabet, Amazon, Apple, Facebook, and Microsoft—cannot operate in Bryce’s “New (Electric) Economy” without it. In recent years, the Giant Five have spent billions of dollars building private, blackout proof electric grids for their ever-larger data centers. “The bigger your network, the more valuable it is to those who own it and use it,” says Bryce. Recent data supports this assertion. Between 2012 and 2017, the Giant Five’s combined electricity use jumped 146 percent, while over the same time period their combined market share rose by 228 percent to \$3.4 billion. In turn, this has led to the Giant Five becoming so valuable and politically powerful that many commentators argue that governments around the world are struggling to effectively regulate and tax them.

There is increasing vulnerability for this expanding demand for electricity in the United States, and specifically the grid system it operates on. This threat from blackouts, says Bryce, takes the form of squirrels gnawing on power lines; sabotage at electric utility substations; natural disasters, whether from weather or from solar flares shutting down electric generation at medical facilities lacking adequate backup systems; cyberattacks on an electricity grid; and the threat of electromagnetic pulse (EMP) attacks generated from a detonated nuclear weapon.

In Part Four (“Twenty-First-Century Terawatts”), Bryce evaluates the future of electricity generation and how this global demand will be met. Global electricity demand increased by 4 percent in 2018. At that growth rate, consumption will double in 18 years (from 6 terawatts today to 12 terawatts in 2036), resulting in significant impacts on national prosperity and global climate change. Further, by 2050, 70 percent of the world’s population (up 2 billion to a projected 9.7 billion people) will be living in high-electricity-demand urban environments. Bryce makes a strong case that renewable energy alone is insufficient (“not by a long shot”) to meet the electricity demands (“terawatt challenge”) of the world’s population over the next three decades. He argues that there are four insurmountable

factors that prevent renewables from taking over our energy and power systems: cost, storage, scale, and land use.

The cost of shifting to renewable sources of energy for electricity generation in recent years has resulted in escalating electric bills for consumers in Germany, Canada, Australia, and California. For example, German residential customers have some of the highest-priced electricity in Europe (\$0.37 per kilowatt-hour), while residential electricity rates in Ontario, Canada rose 71 percent between 2008 and 2016. In addition, the intermittent nature of renewables, particularly solar and wind, requires electric grid operators to have sufficient backup generation capacity or large amounts of storage. What would it take to scale up solar energy for anticipated growth in global demand? Bryce estimates that the world would have to install 14 times as much solar capacity as now exists in Germany, and it would have to do so annually. What about wind-generation capacity? It would take as much wind-energy generating capacity as in China today, and this capacity replicated annually. As to land use, to achieve an all-renewable scenario would require paving over state-sized amounts of land with wind turbines and solar panels. There is also growing political, grass-roots resistance by citizens at the local government level throughout America, Australia, and Europe to this type of renewable technology.

The author is emphatic on what electric energy sources—natural gas, solar, and nuclear—are the right mix for the next three decades or more. Natural gas is low cost and low carbon and can be produced from a small footprint. Moreover, enormous gas fields have been discovered in the United States and offshore in Israel and Africa, and, between 1997 and 2017, proved global gas reserves increased by more than 50 percent. Those reserves now stand at about 193 trillion cubic meters, enough to last for 52 years at current production rates, and which can be transported internationally as liquefied natural gas (LNG). Bryce believes that solar energy will become an increasingly significant portion of the future electricity grid, but the issue of solar energy storage and cost-effective, environmentally friendly disposal of lithium-ion batteries is a barrier to growth. In 2017, global solar-energy production amounted to slightly more than 0.5 percent of global energy demand.

Bryce further argues that if you are anti-carbon dioxide and anti-nuclear, you are pro-blackout. He insists there is no feasible way to reduce carbon dioxide emissions without major increases in

humanity's use of zero-carbon-emission nuclear energy, as there is growing land-use conflicts associated with solar and wind energy projects. The International Energy Agency (IEA), as recently as 2019, declared that without a doubling in nuclear generating capacity by 2050, global carbon dioxide emissions will surge and will become increasingly more costly to control. If the use of nuclear energy continues to decline, IEA reports that \$1.6 trillion in additional electricity sector investment would be required in advanced economies from 2018 to 2040. The result will be \$80 billion higher annual electricity supply costs for the world's advanced economies.

Bryce concludes that the three main criticisms of nuclear energy, radiation, waste, and cost are, respectively, exaggerated (based on empirical studies), political (rather than technical in nature), and issues related to commercialization and permitting. A solution to the cost issue for nuclear energy generation lies with small nuclear reactors (SNR), light-water or molten salt reactors designed to prevent accidents and releases of radioactive materials. Moreover, these SNR designs have smaller reactors (NuScale, a U.S. based company, starts with 60 megawatts), are less expensive to build (as many of the components can be fabricated in a factory rather than on the construction site), and capacity can be added, for example, in 60 megawatt increments to meet increasing power demands.

Bryce has written a compelling book on the 21st century public policy realities of balancing national economic growth, energy choices, and environmental protection. I question whether enough of the population in high-watt countries are open to listening to his thesis. In these countries, voters are generally choosing renewable energy sources, such as solar and wind power, over Bryce's low carbon dioxide (natural gas) and no carbon dioxide (nuclear) alternatives, despite renewables' cost disadvantages, inconsistency for continuous power generation, and associated negative environmental impacts.

In addition, U.S. nuclear energy's track record for new construction since Three Mile Island has been sparse, with only two 2,200 megawatt reactors now under construction in Georgia, the first major nuclear reactor project projected to be completed on U.S. soil in the last 40 years (and project construction cost rising to \$25 billion, up from the original project cost estimate of \$14 billion). Unfortunately, the very real potential for multi-billion-dollar cost overruns for large nuclear reactor projects in the United States is

a major barrier for similar endeavors. However, this high potential for major project cost overruns may provide an opportunity for lower cost, more easily managed, no-carbon-footprint SNR projects to be undertaken on U.S. soil in the next decade. Where Bryce's energy source choices may succeed is with unplugged and low-watt countries, where economic growth is paramount, but natural gas and SNR furled facilities could be a winning combination that trumps the anti-hydrocarbon "green" ideology in the coming years.

A further example of the rush to renewable energy sources can be found in President Joe Biden's plan for a "Clean Energy Revolution," which includes installing 500 million solar modules in the United States over the next five years at a cost of \$40 billion per year. In Biden's world of "Clean Energy," hydrocarbons (including natural gas) and uranium need not apply for federal government support. The next four years could be a turning point for how electricity is to be fueled in America, if not all high-watt countries, over the coming decades.

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First Principles: What America's Founders Learned from the Greeks and Romans and How That Shaped Our Country

Thomas E. Ricks

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Classics, the study of the ancient Greek and Roman civilizations, is today a niche subject studied by a diligent yet small circle of people. The ancient world is increasingly alien to the modern mind. But this was not always the case. For a long time, classical thinkers were revered as excellent sources of wisdom on both political and moral subjects. Classical writings were studied for centuries within the Western world, but few places could match the intense adoration of the ancient world that the American revolutionaries cultivated in the 18th century.

After the election of Donald Trump in 2016, stunning pundits and statistical gurus alike, the Pulitzer Prize-winning author Thomas E. Ricks contemplated the same question many generations of Americans have grappled with: What are our values as a nation? To answer this question, mirroring the American revolutionaries,