



**Levin.**  
PUBLIC SERVICE. LEADERSHIP. CHANGE.

Cleveland State University  
**EngagedScholarship@CSU**

---

Urban Publications

Maxine Goodman Levin College of Urban  
Affairs

---

2-19-2019

## Can U.S. Energy Demand be Supplied by Renewable Sources?

William M. Bowen  
Cleveland State University, [w.bowen@csuohio.edu](mailto:w.bowen@csuohio.edu)

Follow this and additional works at: [https://engagedscholarship.csuohio.edu/urban\\_facpub](https://engagedscholarship.csuohio.edu/urban_facpub)



Part of the [Urban Studies and Planning Commons](#)

**How does access to this work benefit you? Let us know!**

---

### Repository Citation

Bowen, William M., "Can U.S. Energy Demand be Supplied by Renewable Sources?" (2019). *Urban Publications*. 0 1 2 3 1588.  
[https://engagedscholarship.csuohio.edu/urban\\_facpub/1588](https://engagedscholarship.csuohio.edu/urban_facpub/1588)

This Report is brought to you for free and open access by the Maxine Goodman Levin College of Urban Affairs at EngagedScholarship@CSU. It has been accepted for inclusion in Urban Publications by an authorized administrator of EngagedScholarship@CSU. For more information, please contact [library.es@csuohio.edu](mailto:library.es@csuohio.edu).



## Focus on Facts

Maxine Goodman Levin College of Urban Affairs – Cleveland State University

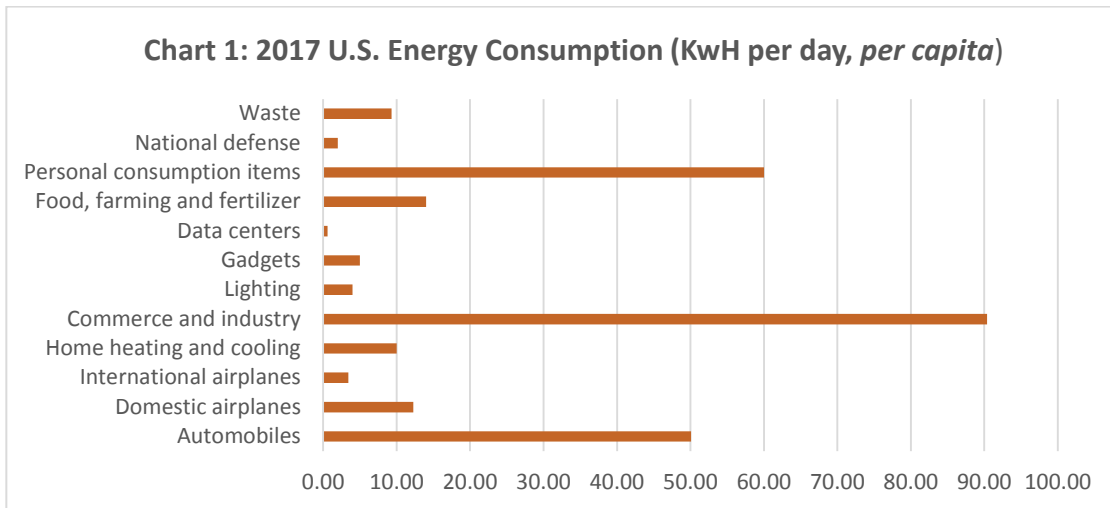
February 2019, Number 2.

### Can U.S. Energy Demand be Supplied by Renewable Sources?

William Bowen, Ph.D.

Professor, and Faculty Research Director, Energy Policy Center. [w.bowen@csuohio.edu](mailto:w.bowen@csuohio.edu)

- America’s high standard of living is fueled by high *per capita* consumption of energy. This has been true for every nation that has become prosperous over the last 400 years.<sup>1</sup>
- Energy comes from many sources. It is used for many purposes. The amount of energy from different sources (coal, oil, gas, nuclear, wind, etc.) can be compared by using a common form of measurement known as a kilowatt hour (kWh). One kWh is the amount of energy needed to power ten 100-watt lightbulbs for one hour, or one 1000-watt microwave oven for one hour.
- In 2017, the U.S. consumed about 260 kWh’s of energy *per capita* each day.<sup>2</sup> Chart 1 shows the U.S. daily *per capita* energy use across different types of activities.<sup>3</sup>



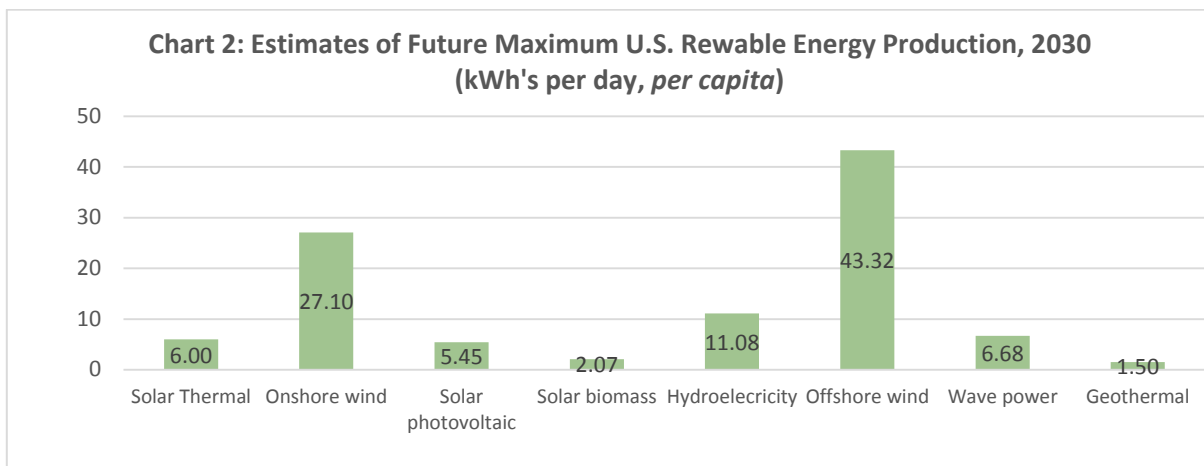
- Fossil fuels (coal, natural gas, oil, etc.) supply the vast majority of all energy consumed each day in the U.S. These sources are not renewable. It is a scientific certainty that global warming is driven by the carbon they release into the atmosphere.

<sup>1</sup> See William M. Bowen and Robert E. Gleeson, *The Evolution of Human Settlements: From Pleistocene Origins to Anthropocene Prospects* (Cham, Switzerland: Palgrave Macmillan, 2019).

<sup>2</sup> Energy Information Administration, U.S. Department of Energy.

<sup>3</sup> The "domestic airplane" and "international airplane" numbers are both "per flier" rather than "*per capita*."

- In 2017, the United Nations estimates that \$279.8 billion was invested worldwide in new sources of renewable energy (solar, thermal, wind, biomass, hydroelectric, ocean waves, and geothermal.)<sup>4</sup> The three largest developing nations (China, India, and Brazil) accounted for more than half (51 percent). China alone invested \$126.6 billion. U.S. sources invested about \$40.5 billion (only \$4 billion from the U.S. government). In 2017 renewable sources provided 12.7 percent of U.S. energy and 12.1 percent of all energy worldwide.
- Chart 2 summarizes my estimates of the maximum potential production of energy in the U.S. from all forms of renewable energy by 2030. These estimates are based on highly credible, readily available data sources within the U.S. Energy Information Administration and other such reliable sources. These production levels total 102.6 kWh's per day, *per capita*: four times current levels.



- While some forms of nuclear energy could be considered renewable (e.g. molten salt reactors), these estimates do not include any form of nuclear energy. In 2017 about 20 percent of U.S. energy came from nuclear power.
- On February 7, 2019 Sen. Edward Markey and Rep. Alexandria Ocasio-Cortez proposed a sweeping set of new public policy goals collectively known as the “New Green Deal.”<sup>5</sup> Elements include:
  - a) meet 100 percent of all U.S. energy demand by renewable sources within ten years;
  - b) greatly reduce *per capita* energy consumption;
  - c) continue to increase the standard of living; and
  - d) greatly improve the energy efficiency of industrial production (largely through the deployment of new technology).
- Based on my optimistic estimates, the only way to achieve 100 percent U.S. reliance on renewable sources of energy by 2030 would be to increase renewable production by 400 percent AND reduce our daily *per capita* consumption by at least 60 percent from 2017 levels.

<sup>4</sup> United Nations Environmental Program, “Global Trends in Renewable Energy Investment, 2018.”

<sup>5</sup> “Recognizing the duty of the Federal Government to create a Green New Deal.” Downloaded from <https://apps.npr.org/documents/document.html?id=5729033-Green-New-Deal-FINAL>.