

# FOOTPRINT OF ENERGY



## EXECUTIVE SUMMARY:

This report updates Strata's previous research on the land requirements of different energy sources. Specifically, we consider the acres of land required to meet US energy requirements from solar or wind, as proposed by the Green New Deal. This update uses new observation-based data that show that large scale wind or solar will require five to twenty times more land than previously estimated by the US Department of Energy or the Intergovernmental Panel on Climate Change.

## WIND:

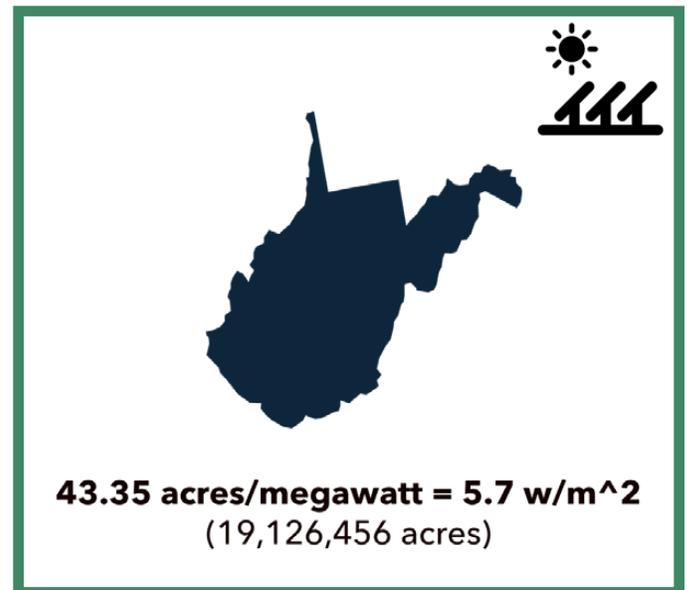
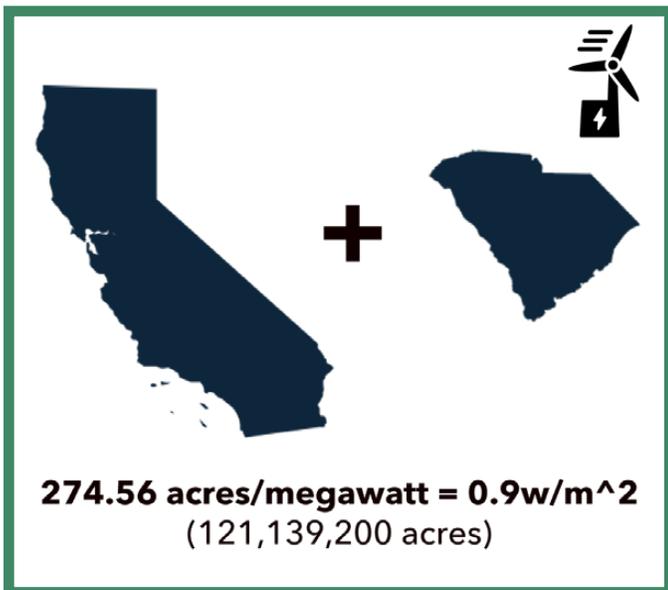
Our original study considered the acres of land needed per megawatt for onshore wind energy production (offshore wind has proven so politically unpopular in the United States that we assume there will be little of it in the future). The new data demonstrate how wind

turbines in large scale wind installations cast "wind shadows," which drastically reduce the efficiency of nearby turbines.

Large scale wind farms require an average of 274.56 acres/MW. If wind power were the sole provider of electrical energy in the United States, a land mass the size of California and South Carolina combined would be needed to meet domestic electricity demand.

## SOLAR:

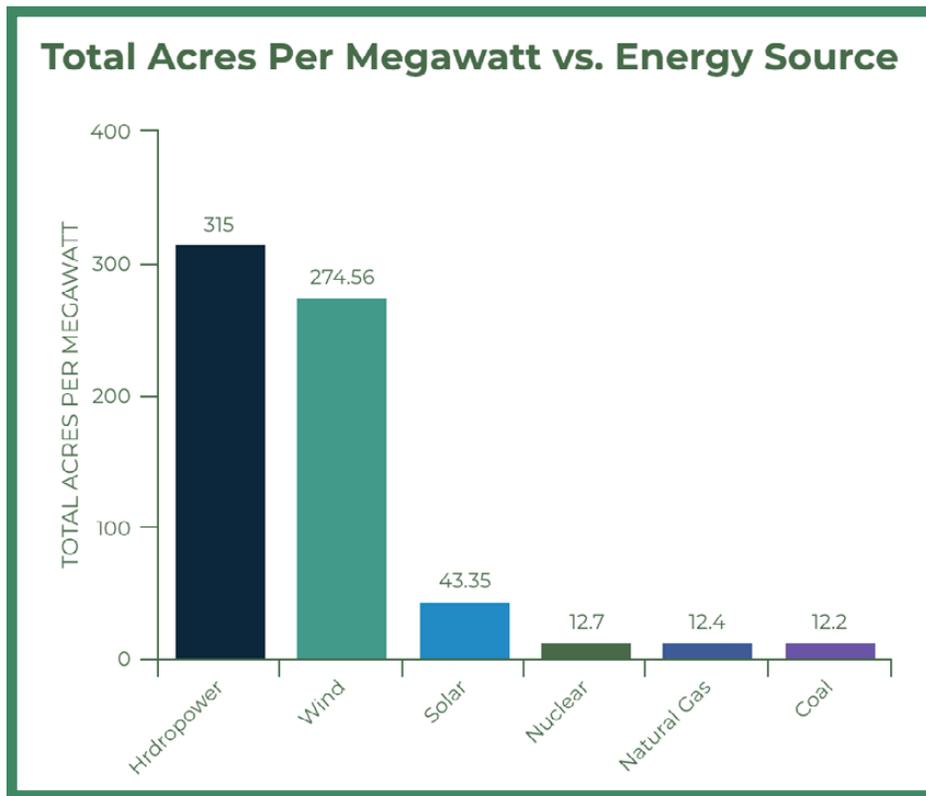
Solar power is generated from either photovoltaic (PV) panels that directly convert sunlight into electricity or solar thermal technology that harnesses heat from the sun. Our earlier estimates were based on data that did not account for the open spaces that are required for access roads, substations, and minimizing shading from adjacent panels.



Large scale solar fields require an average of 43.35 acres/MW. If solar power were the sole provider of electrical energy in the United States, a landmass the size of West Virginia would be needed to meet domestic electricity demand.

### ENERGY COMPARISON:

Coal, natural gas, and nuclear all have relatively smaller footprints.. Hydropower requires the most land, but wind and solar also have significantly high land-use requirements.



### CONCLUSION:

Although the improvements made to producing electricity more efficiently are promising, the number of acres required to convert the United States entirely to wind and solar electricity production is far larger than previous, optimistic

claims. Meeting renewable energy targets such as those proposed under the Green New Deal will require increasing the estimates of acres needed by five to twenty times. Furthermore, there will still need to be substantial fossil fuel infrastructure in place to meet demand when the sun does not shine or the wind does not blow.

### SOURCES:

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