



Nationwide DR Program and Carbon Reduction Potential Analysis for RTU

Xintian Zhang¹, Dr. Bing Dong¹, Xuezheng Wang¹

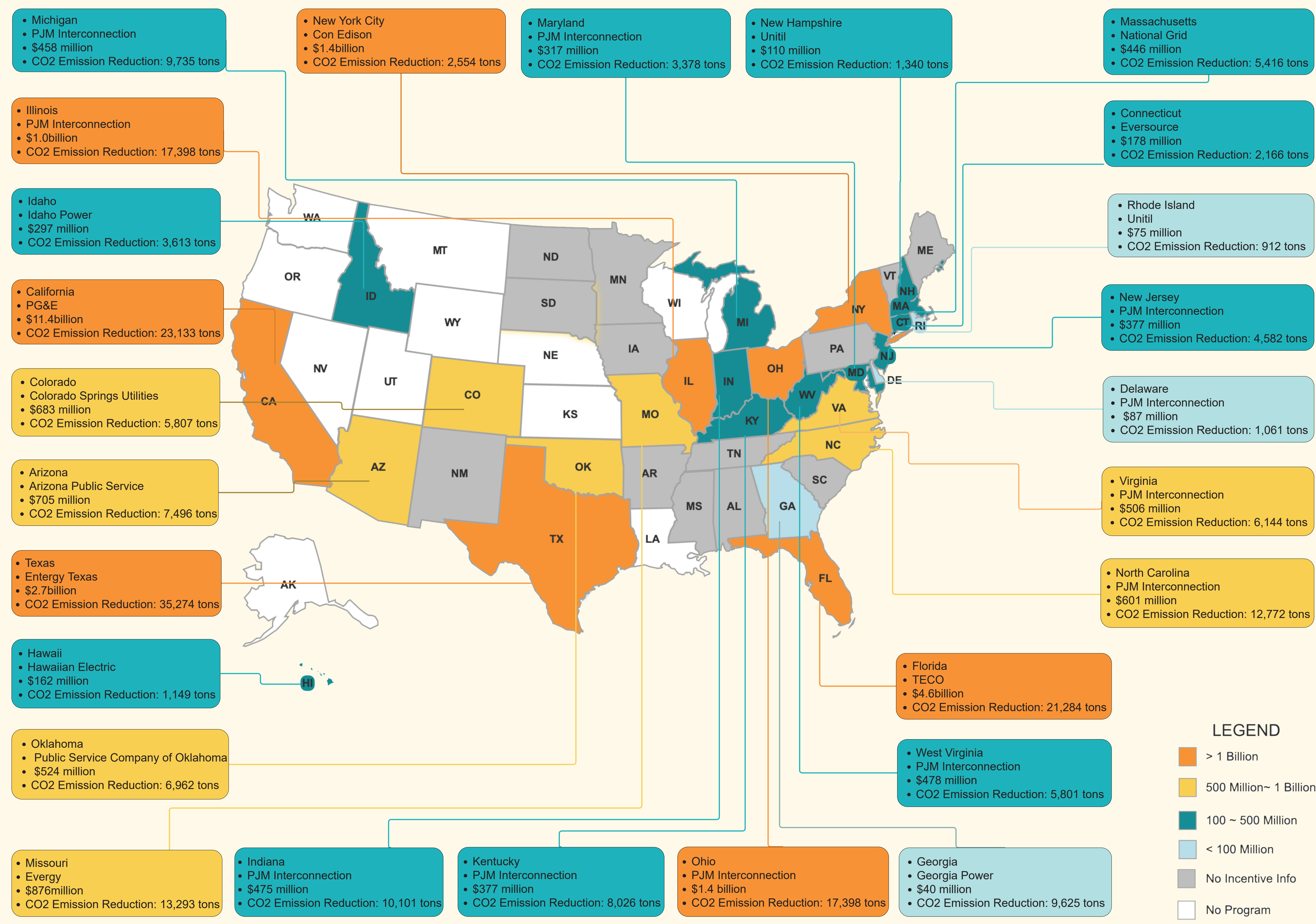
¹WellBuildingControl LLC

Energy Wasting and Market

In the U.S., the commercial and industrial sectors use **\$260 billion** of electricity and natural gas each year. The amount of energy wasted related to building control in typical commercial buildings is up to **15%**. It is an enormous waste! The market for building control is over 40 billion.

Demand Response Program

The electric distribution utilities and the wholesale system operators offer programs to customers to reduce electricity usage when demand on the network is highest. Demand response programs help avoid overload, reduce emissions, and avoid expensive equipment upgrades. Customers can participate in a demand response program and receive incentive payments for reducing electricity use from the grid during periods of the highest electricity demand.



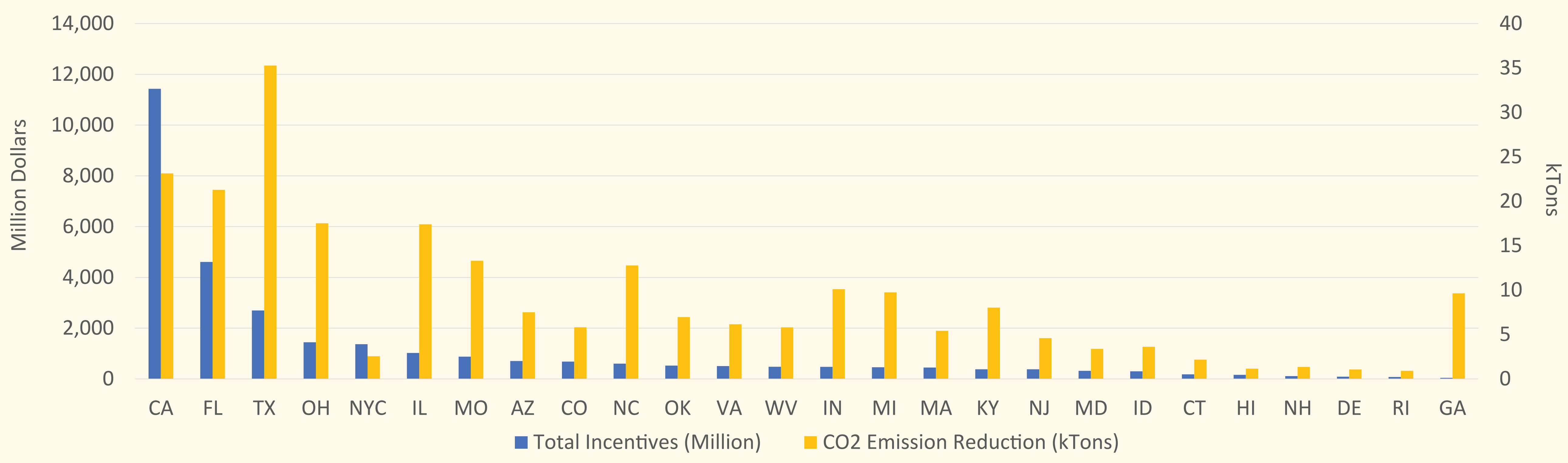
RTU Market Size

There are more than 54 million commercial properties across the United States. **Over 90%** of commercial buildings are small to medium size, and **more than half** of them are installed with RTU. The rooftop unit market is enormous and keeps increasing every year.

Nationwide Analysis

The picture shows the total incentive in each state for one summer season from demand response programs and carbon emission reductions. From the available information for 26 states, the three most aggressive states of incentives are California, Florida, and Texas. New York City's incentives surpass that of many other states. In comparison, carbon emission reductions are not proportional to the incentives.

DR Incentives, Energy and Carbon Emission Reduction Potential Analysis with WBC's Technology



Roth, K. W., Feng, M., Llana, P., & Westphal, D. (2004). The energy impact of faults in U.S. commercial buildings. Retrieved June 17, 2022, from https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1664&context=iracc
United States Commercial Real Estate. Reonomy. (n.d.). Retrieved August 9, 2022, from https://www.reonomy.com/properties/commercial-real-estate/us/1
Michael Deru, Miles Hayes, Katie Vrabell, Carly Burke, Amy Jiron and Cedar Blazek. 2021. Long and Winding Road to Higher Efficiency—The RTU Story: Preprint. Golden, CO: National Renewable Energy Laboratory. NREL/CP-5500-77092. https://www.nrel.gov/docs/fy21osti/77092.