

BUILD BACK BETTER Clean Energy Storage

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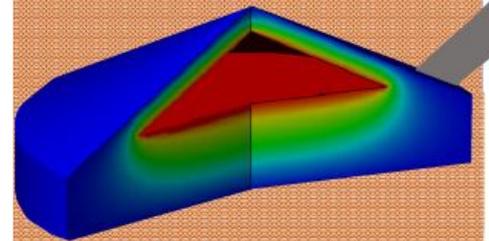
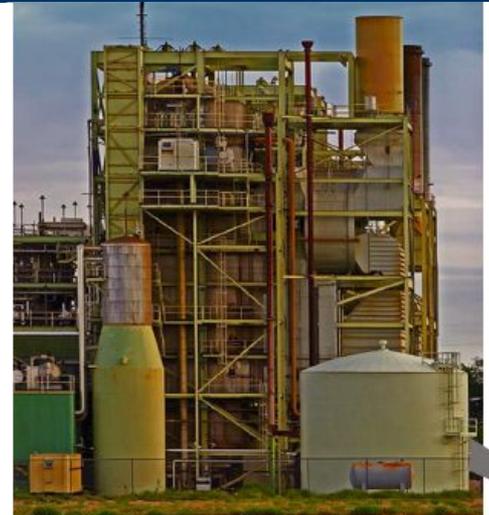
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New Mexico Legislature
Science, Technology
& Telecommunications Committee

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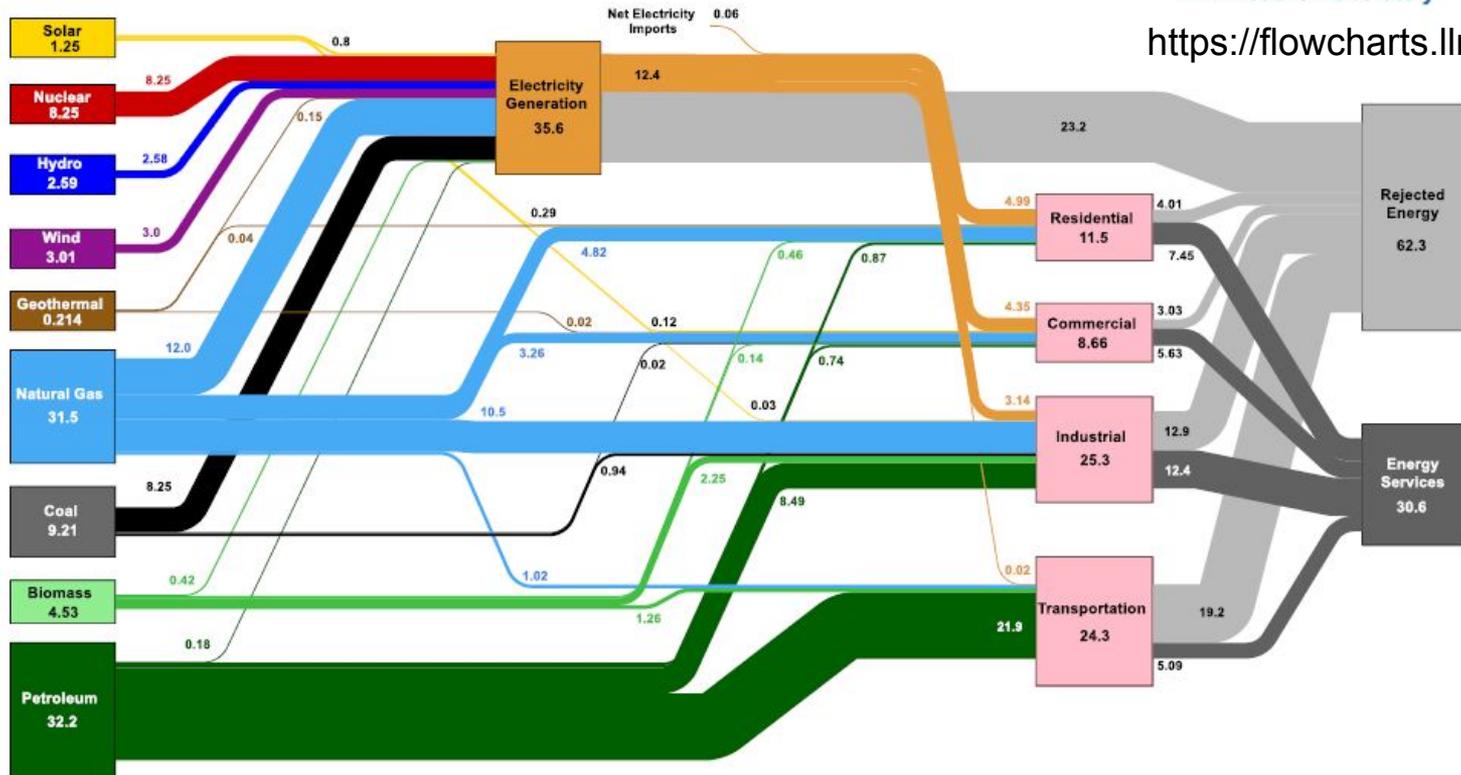
Background

U.S. Energy Sources & Uses

Estimated U.S. Energy Consumption in 2020: 92.9 Quads



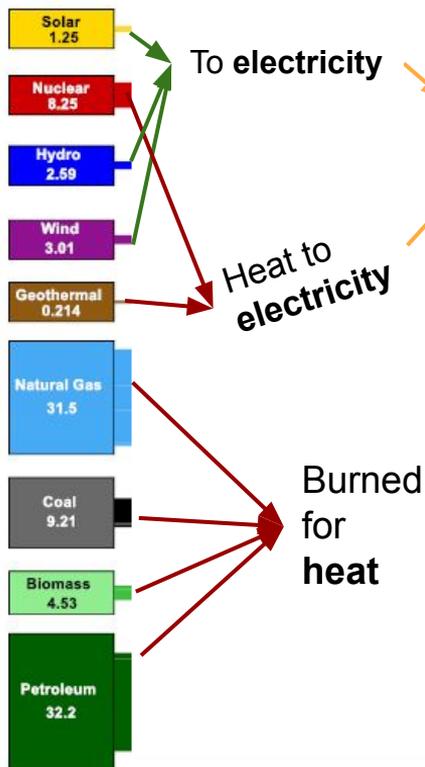
<https://flowcharts.llnl.gov/>



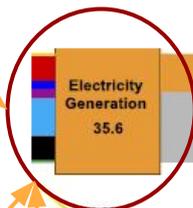
Heat and Electricity

Renewable Energy & Nuclear vs Combustion Sources

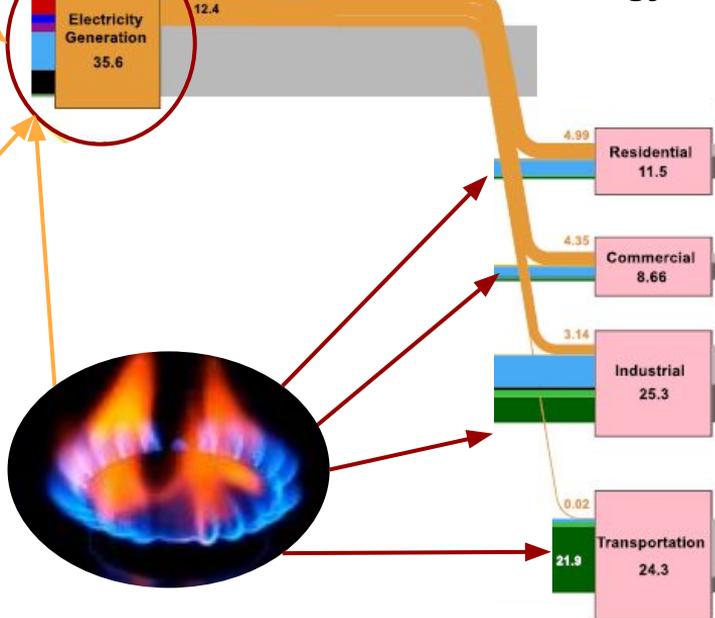
Energy Sources



Secondary



Energy Sinks



**Energy Sources:
For Heat or
Electricity**

Problem

Transition to Clean Energy is Emergency

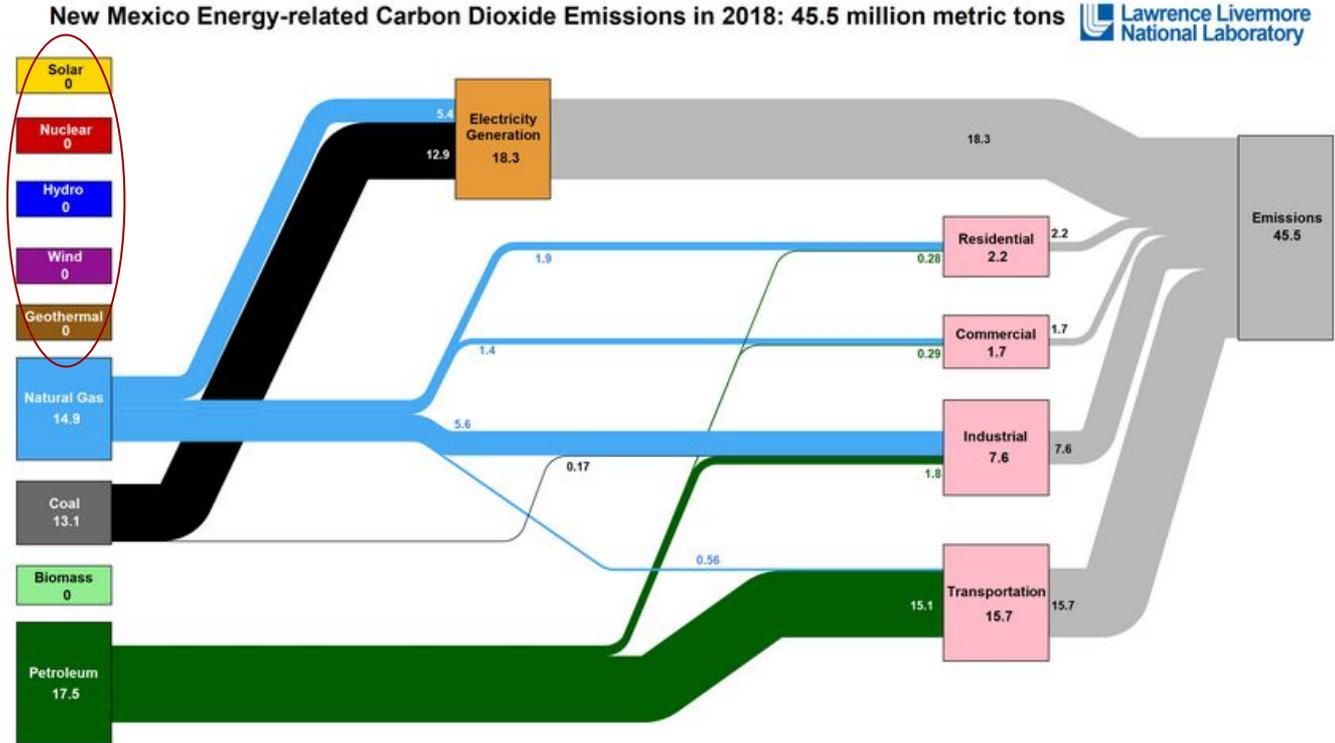
**Reasons to
Transition directly
to
Clean Energy**

- 1. Climate Crisis**
- 2. \$20Billion in direct subsidies & \$650Billion in indirect subsidies annually**
- 3. 8.7 million people a year die globally from FF air pollution**
- 4. People and \$\$ resources are limited**

Problem

Speed and Goals Require Quick and Scalable Solutions

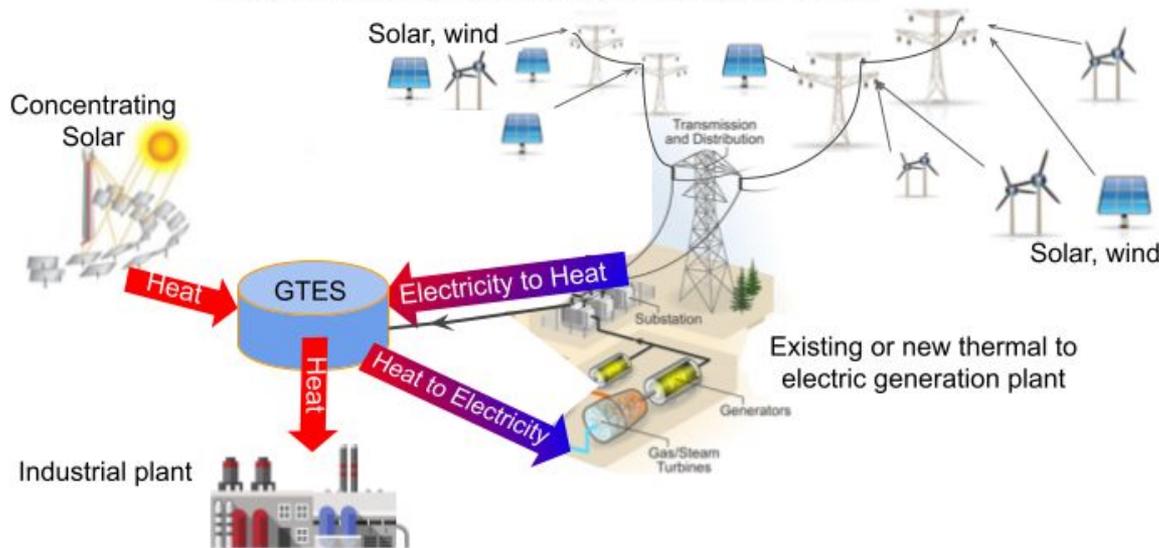
1. Cut 50% by 2030
2. For electricity and heat
3. Waste Emissions absent & NW coal is methane bed coal



Solution

Support Clean Energy Sources with Thermal Energy Storage

GigaWatt Thermal Energy Storage (GTES)



Energy Storage:

**For heat or
heat to electricity**

Power and Duration

Medium to long term & Scalable

<https://www.nrel.gov/docs/fy19osti/71714.pdf>

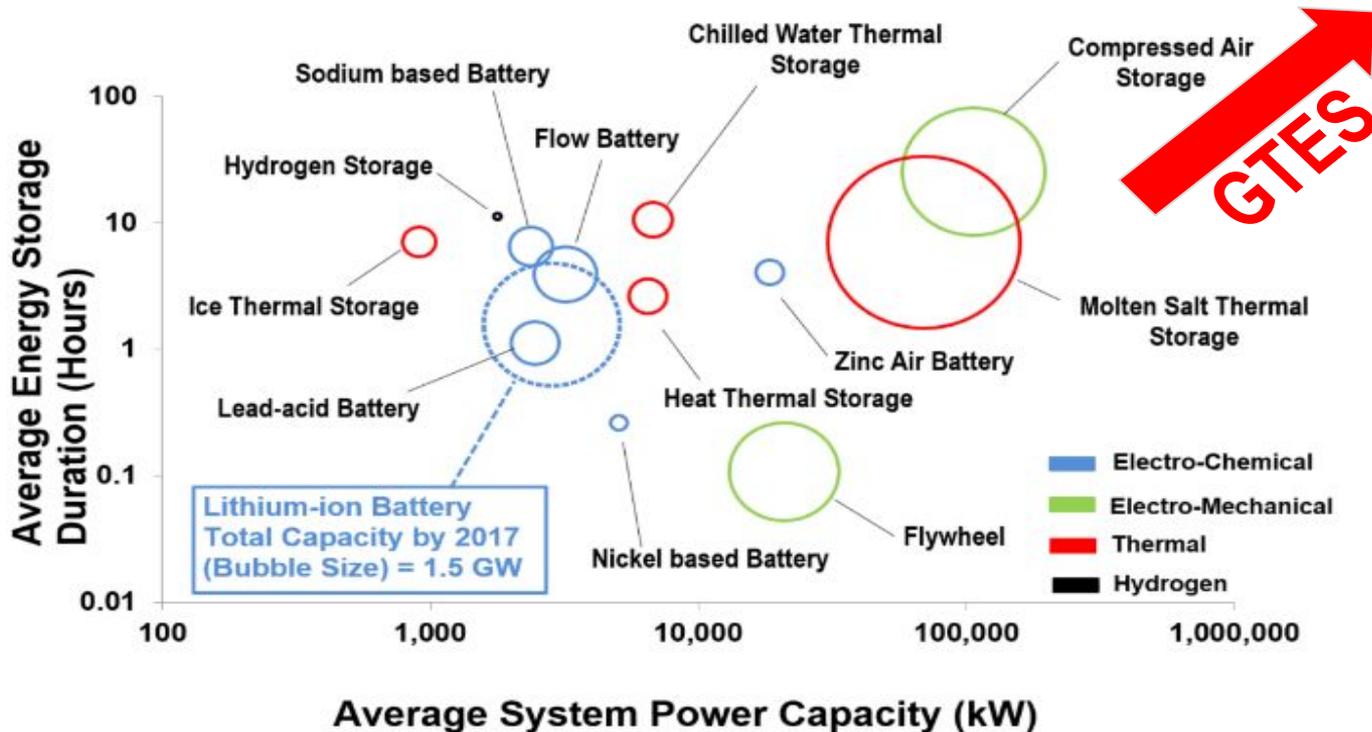
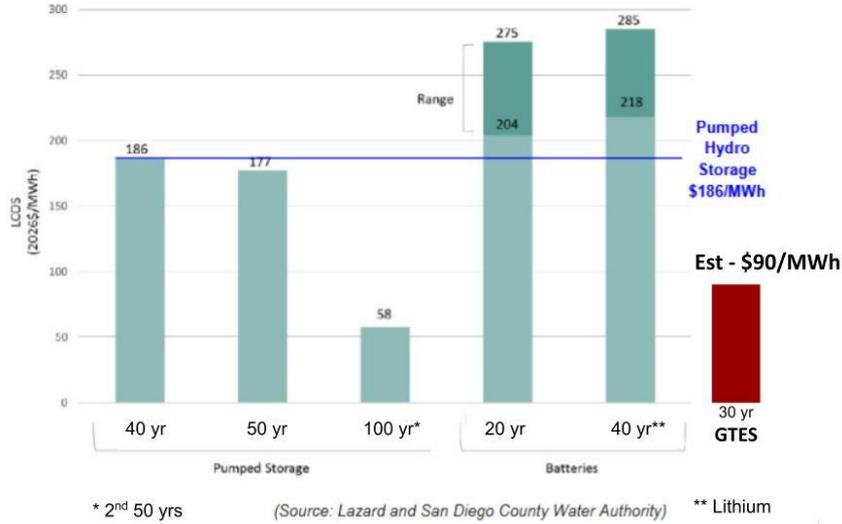
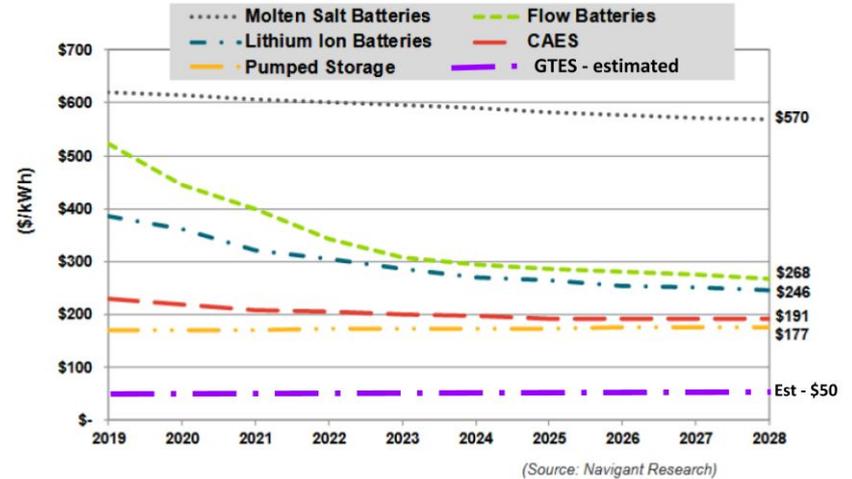


Figure 1. Average characteristics of energy storage systems built worldwide between 1958 and 2017, by technology, from the DOE Energy Storage Database (2018), sample size = 1,041 (pumped hydro not shown because of its very large global capacity)

Levelized Cost of Storage

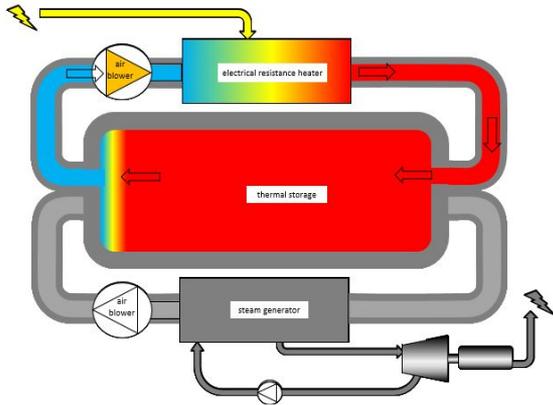


Capital Expenditures - CAPEX



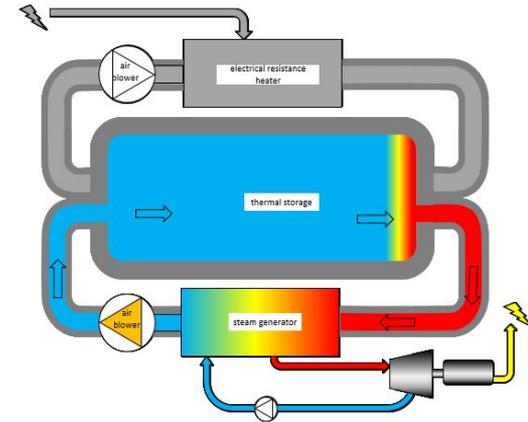
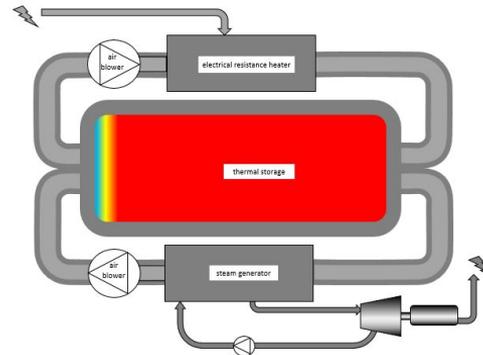
Operation

Charge-Store-Discharge



1. Charge w/
clean, cheap
RE

2. Store heat for
long periods



3. Provide heat
on demand

Siting, Construction & Operation

Geography, Footprint, Business Model, & Workforce



- 1. Geography agnostic**
- 2. Compact footprint**
- 3. Less permitting, safe materials & Turn key**
- 4. Maintain much of plant workforce**

Team

New Mexico Based and Dedicated



- **Engineers & Veterans**
- **Entrepreneurs**
- **Innovative**
- **Social Justice Focused**

Company Growth

Local Beginning with Worldwide Potential



Facilities Management



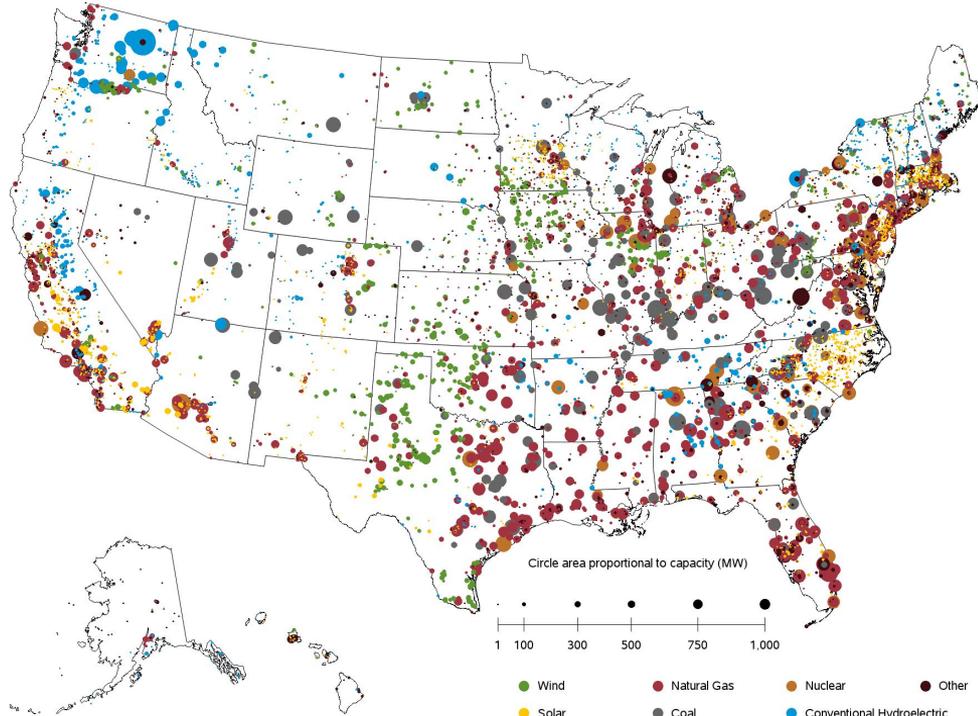
1. **Constructed not Manufactured**
2. **UNM student assisted**
3. **UNM potential for reducing carbon**
4. **Maintain much of plant workforce**



Opportunity

Replace Part of Heat with GTES at Shuttering Plants

Operable utility-scale generating units as of December 2018



Sources: U.S. Energy Information Administration, Form EIA-860, 'Annual Electric Generator Report' and Form EIA-860M, 'Monthly Update to the Annual Electric Generator Report.'

**Energy Source:
For Electricity**

For More Information

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or

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