

# FACT SHEET

## MICHIGAN AND NUCLEAR ENERGY

### Key Facts

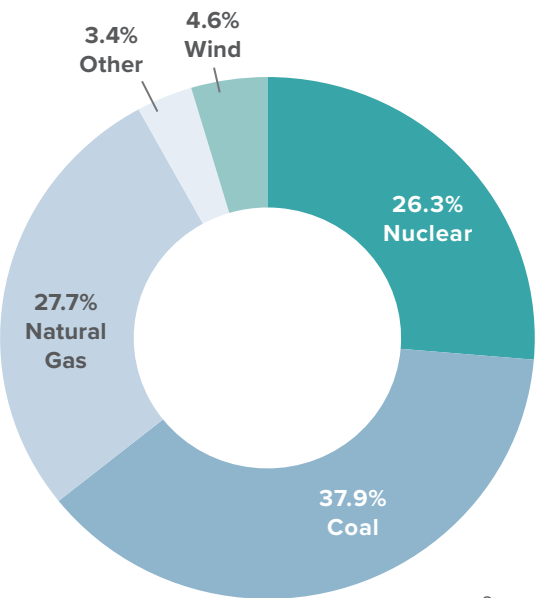
- Michigan's four nuclear power reactors generate **26 percent** of the state's electricity while emitting no greenhouse gases
- Nuclear energy is Michigan's **most reliable power source**, producing electricity around-the-clock
- Michigan's nuclear energy facilities employ more than **2,650 workers**

### Infrastructure for Clean, Reliable Electricity

Michigan is home to four nuclear power reactors that produce 82 percent of the state's emission-free electricity. These nuclear energy facilities protect air quality and public health. Nuclear energy generates nearly 20 percent of our nation's electricity and provides more than 55 percent of our emission-free power, making it an essential partner to renewable energy.

Nuclear is America's most reliable source of electricity. Michigan nuclear plants produced power more than 89 percent of the time over the past three years, ensuring power is available whenever it is needed. Nuclear energy is a vital part of U.S. infrastructure that keeps electricity prices and grids stable. It ensures that consumers are not overly reliant on just one or two sources of electricity.

### Sources of Electricity in Michigan



Source: ABB Velocity Suite / U.S. Energy Information Administration

Other includes petroleum, biomass and geothermal along with hydro, wind and solar if they account for less than 3% of electricity generated.

### Nuclear Energy Facilities



Facility	Company	Location	Capacity (MW)	Capacity Factor (%) <sup>1</sup>
1 Cook 1	AEP	Bridgman	1,009	93.7
2 Cook 2	AEP	Bridgman	1,168	86
3 Fermi 2	DTE Energy	Newport	1,141	82
4 Palisades	Entergy	Covert	804	88.9
State Totals			4,122	89.2

Source: U.S. Energy Information Administration

<sup>1</sup>Capacity factor three-year average is electricity produced compared to the maximum that could be produced and is calculated based on generation in 2016, 2017 and 2018.

### Supporting Jobs and the Economy

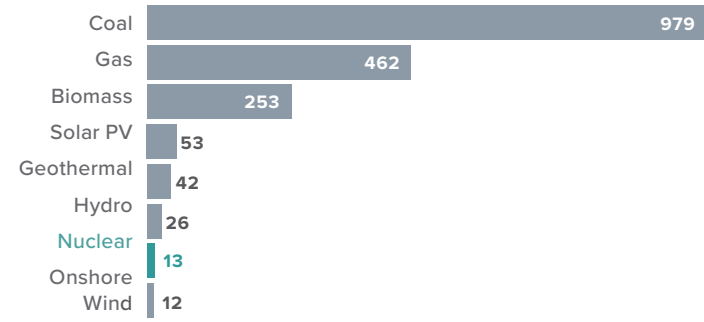
- Nuclear energy facilities in Michigan employ more than 2,650 workers.
- American innovators are developing new nuclear technologies that have the potential to create additional jobs and bring in export dollars.

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## Comparison of Life Cycle Emissions

Tons of Carbon Dioxide Equivalent per Gigawatt-Hour



Source: Annex III: Technology-specific cost and performance parameters. In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Edenhofer, O., et.al, Cambridge University Press, 2014. The numbers shown are the median of studies examined by the IPCC in grams CO<sub>2</sub>e per kWh and are converted to tons CO<sub>2</sub>e per GWh.

## Nuclear Is Clean Air Energy

- The use of nuclear energy in 2018 prevented the emission of 528 million metric tons of carbon dioxide. This equals the amount released in a year by 112 million passenger cars.
- Nuclear energy is the only clean air electricity source that can produce large amounts of electricity around-the-clock.
- Numerous studies demonstrate that nuclear energy's life cycle greenhouse gas emissions are comparable to renewable energy, such as wind and hydropower, and far less than coal or natural gas-fueled power plants.
- The nation's nuclear energy facilities also prevented the emission of 346,485 short tons of sulfur dioxide and 286,516 short tons of nitrogen oxide in 2018.

Emissions Prevented in Michigan	Quantity Prevented in 2018
Sulfur dioxide (SO <sub>2</sub> )	18,179 short tons
Nitrogen oxide (NO <sub>x</sub> )	13,475 short tons
Carbon dioxide (CO <sub>2</sub> )	22.93 million metric tons

Source: U.S. Environmental Protection Agency and U.S. Energy Information Association

## Committed to Safety

- America's nuclear energy facilities are among the safest and most secure industrial facilities.
- The independent U.S. Nuclear Regulatory Commission regulates and monitors plant performance in three areas: reactor safety, radiation safety and security.
- After more than 60 years of commercial nuclear energy production in the United States and more than 4,000 reactor years of operation, there have been no radiation-related health effects linked to the operation of nuclear energy facilities.

## Managing Used Nuclear Fuel

- Each nuclear energy facility stores used fuel safely and securely on-site, awaiting consolidated storage and disposal by the U.S. Department of Energy. As of 2016, Michigan has contributed approximately \$844 million to the federal Nuclear Waste Fund.
- There are 3,166 metric tons of used nuclear fuel in storage at nuclear plant sites in Michigan.
- All the used nuclear fuel produced by the nuclear energy industry over 60 years—if stacked end to end—would cover an area the size of a football field to a depth of less than 10 yards.



Used fuel at nuclear energy facilities is cooled in secure steel-lined concrete pools filled with water.



After the cooling period, nuclear energy facilities store used fuel safely on-site in steel and concrete vaults.

Source: Gutherman Technical Services