



Office of Nuclear Energy

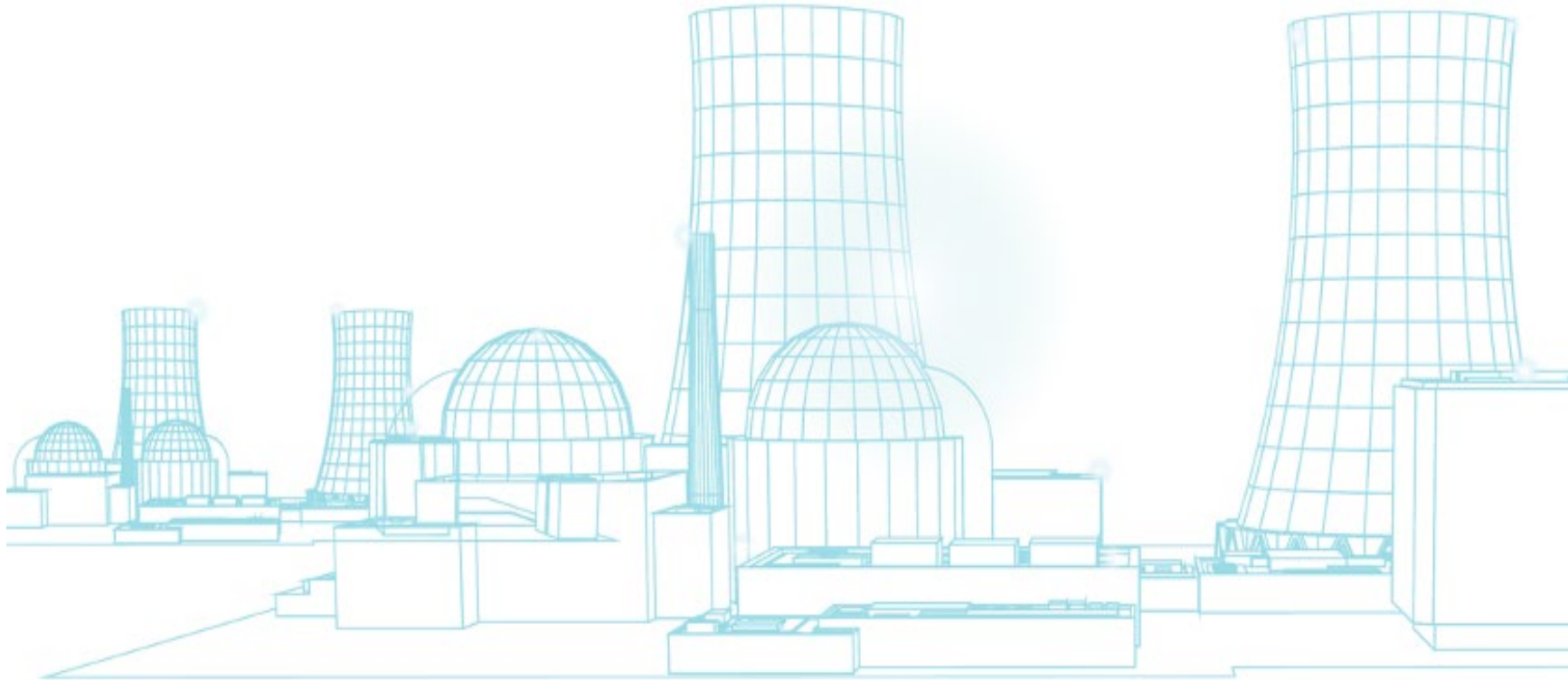
Energy transition options: coal-to-nuclear considerations

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Energy



OUR MISSION

To advance nuclear energy science and technology to meet U.S. energy, environmental, and economic needs



A photograph of a nuclear power plant with two large cooling towers on the left and right sides, and several smaller buildings in the center. The sky is overcast with grey clouds. The entire image has a blue color cast.

PRIORITIES

Keep Existing Plants Open

Build New Reactors

Secure and Sustain the Nuclear Fuel Cycle

Expand International Nuclear Energy Cooperation

STATE of **NUCLEAR**

94

commercial reactors

19%

of U.S. electricity generation

48%

of U.S. clean power production

475,000

U.S. jobs supported

1

SMR certified



ADVANCED NUCLEAR REACTORS

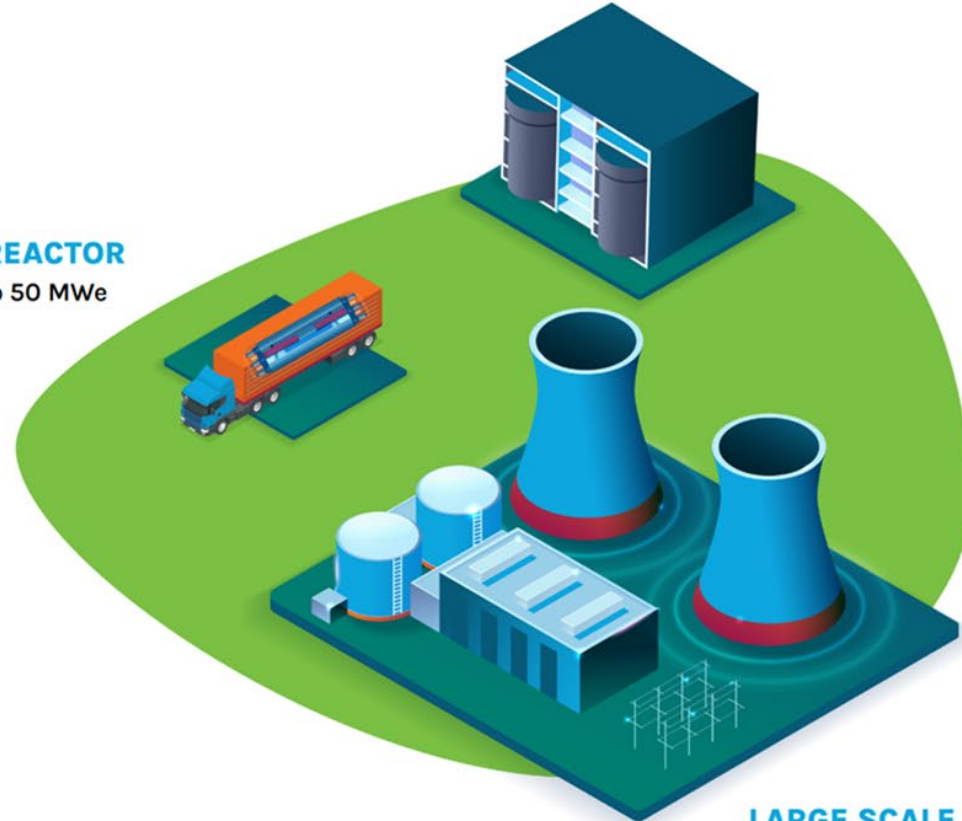
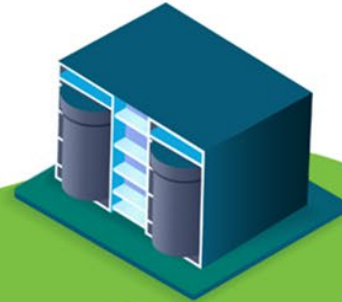
ADVANCED NUCLEAR REACTORS FEATURES:

- Range of sizes
- Smaller footprint
- Advanced manufacturing
- Flexible operation
- Electricity generation and process heat production
- Ability to pair with renewables
- Passive safety features

MICROREACTOR
1 MWe to 50 MWe



SMALL MODULAR REACTOR
50 MWe to mid-100s MWe

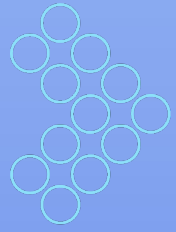


LARGE SCALE REACTOR
Mid-100s MWe to 1,000+ MWe

COAL *to* NUCLEAR

Repowering coal plants with advanced nuclear reactors can help unlock new job, economic, and environmental opportunities for energy communities across the country as the United States shifts toward cleaner energy sources. Here's how it works.





Retire



30%

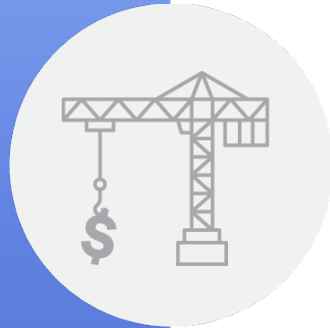
of the nation's coal plants are expected to retire by 2035

more than **300**

retired and retiring coal plants are suitable to host advanced nuclear plants and technologies



Reuse



up to **35%**

can be saved on plant construction costs by reusing existing coal plant infrastructure

650+

high-paying nuclear jobs would be created or converted in the region



Re-Power

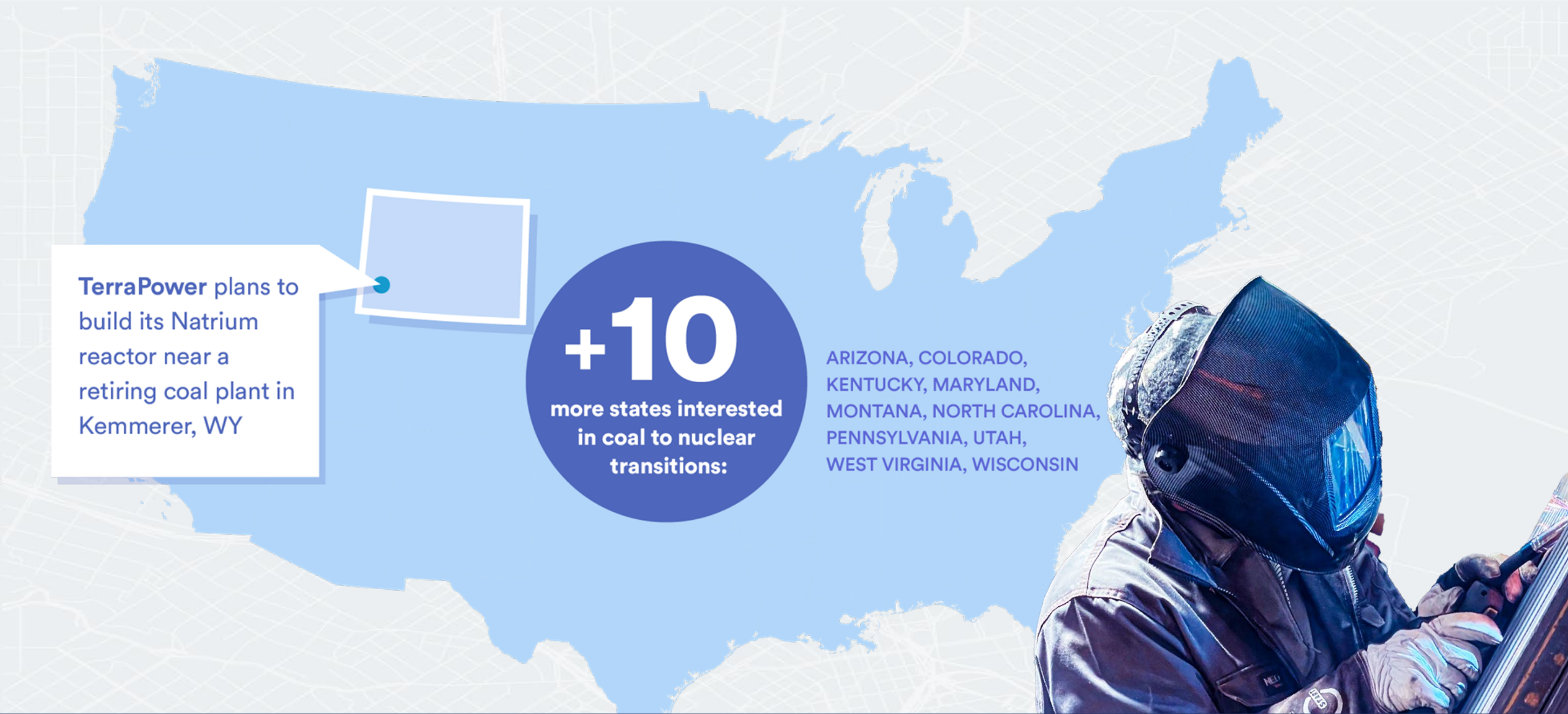


up to **86%**

drop in emissions in the surrounding region by replacing coal with nuclear plants

\$275m

added annual economic activity in nuclear-sector communities



TerraPower plans to build its Natrium reactor near a retiring coal plant in Kemmerer, WY

+10

more states interested in coal to nuclear transitions:

ARIZONA, COLORADO, KENTUCKY, MARYLAND, MONTANA, NORTH CAROLINA, PENNSYLVANIA, UTAH, WEST VIRGINIA, WISCONSIN



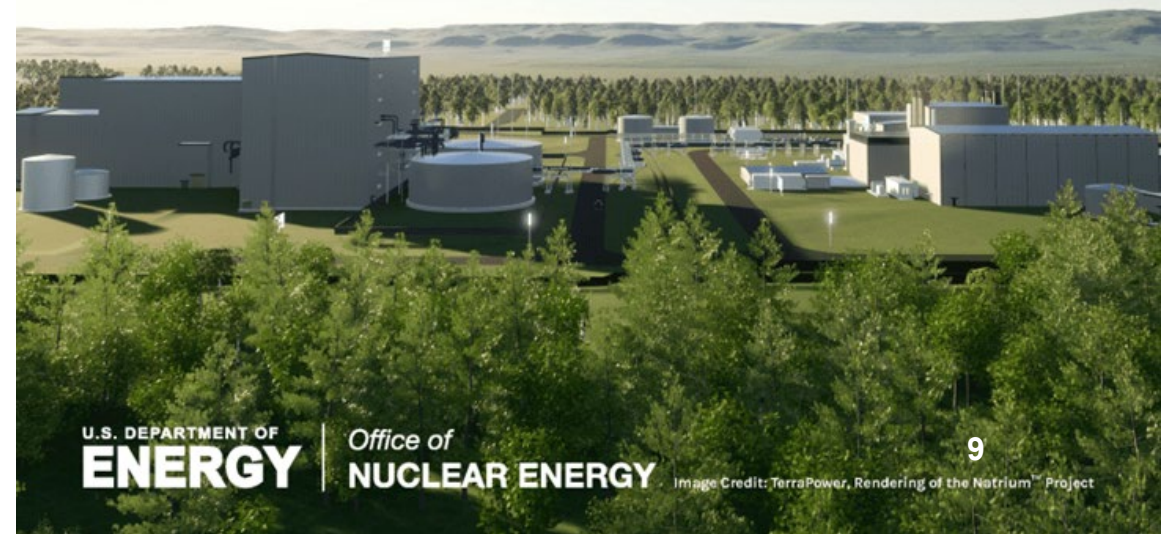
Coal to Nuclear ensures energy communities are not left behind on the transition to clean energy.

- High-level look at economic impacts
- Workforce transition considerations
- Policy and funding information
- Brief overview of considerations for utilities

[Coal-to-Nuclear Transitions: An Information Guide | Department of Energy](#)

COAL-TO-NUCLEAR TRANSITIONS:

AN INFORMATION GUIDE





ECONOMIC INFORMATION

- A nuclear power plant replacing a coal power plant would employ more people and create additional long-term jobs in host communities.
- A nuclear power plant replacing a coal power plant would increase total income in host communities.
- A nuclear power plant replacing a coal power plant would increase revenue for host communities, power plant operators, and local suppliers.

ECONOMIC IMPACT EXAMPLE: ADDED JOBS

	Population Range	< 20,000	20,000-39,999	40,000-89,999	90,000-199,999	200,000+
100 MWe	Jobs with Coal Plant	56	64	68	69	80
	Jobs with Nuclear Plant	121	139	144	150	178
	Added Jobs	65	75	76	81	98
300 MWe	Jobs with Coal Plant	108	128	134	143	171
	Jobs with Nuclear Plant	207	253	266	283	352
	Added Jobs	99	125	132	140	181
500 MWe	Jobs with Coal Plant	166	198	220	223	270
	Jobs with Nuclear Plant	313	387	408	436	548
	Added Jobs	147	189	188	213	278
700 MWe	Jobs with Coal Plant	236	281	312	316	382
	Jobs with Nuclear Plant	443	547	576	616	773
	Added Jobs	207	266	264	300	391
900 MWe	Jobs with Coal Plant	312	370	410	415	501
	Jobs with Nuclear Plant	573	707	744	795	998
	Added Jobs	261	337	334	380	497



WORKFORCE INFORMATION

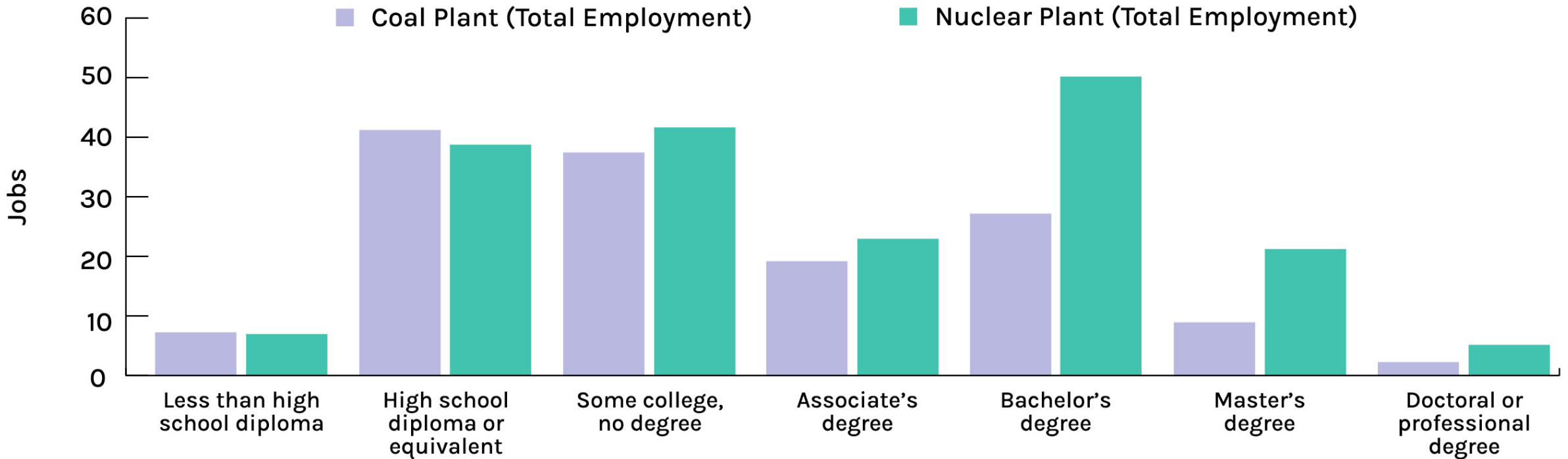
- Comparably sized nuclear plant provides more jobs than coal plant.
- Most workers at existing coal plant should be able to transition to work at replacement nuclear plant.
- Nuclear plants require more workers in almost every educational category, except jobs that require high school diploma or less.
- Nuclear plants employ similar number of people with high school diploma or less.
- Training or reskilling coal plant workforce to support nuclear plant involves collaboration of multiple groups, including utility or utilities involved in the transition, labor unions, local communities impacted by the loss or gain of jobs, and local colleges or other educational institutions.

OVERLAP IN JOBS (SAMPLE)

- Significant overlap in types of jobs
- Many jobs share identical or similar occupation codes
- Expect that some training or reskilling needed for jobs with identical and similar occupation codes

Construction and Extraction, and Installation, Maintenance, and Repair Occupations	47-2073	Operating engineers and other construction equipment operators	1	0	-1
	47-2111	Electricians	2	3	+1
	49-1011	First-line supervisors of mechanics, installers, and repairers	2	4	+2
	49-2095	Electrical and electronics repairers, powerhouse, substation, and relay	4	4	0
	49-9012	Control and valve installers and repairers, except mechanical door	2	0	-2
	49-9041	Industrial machinery mechanics	2	4	+2
	49-9051	Electrical power-line installers and repairers	5	1	-4
	49-9071	Maintenance and repair workers, general	1	1	0
Production Occupations	51-1011	First-line supervisors of production and operating workers	3	7	+4
	51-8011	Nuclear power reactor operators	0	14	+14
	51-4121	Welders, cutters, solderers, and brazers	1	0	-1
	51-8012	Power distributors and dispatchers	2	0	-2
	51-8013	Power plant operators	14	2	-12
	51-8031	Water and wastewater treatment plant and system operators	1	0	-1

WORKFORCE CONSIDERATION: EMPLOYMENT BY EDUCATION TYPE





POLICY AND FUNDING INFORMATION

- Significant new nuclear capacity will be crucial in achieving net-zero policy targets by 2050.
- Inflation Reduction Act includes billions of dollars in financial support to spur deployment of clean energy projects with focus on deploying clean energy in disadvantaged communities, energy communities, and other communities in need.
- Several funding mechanisms may be leveraged to support advanced nuclear energy projects that communities and utilities can explore as they consider coal-to-nuclear transitions. These include tax credits, as well as loans and loan guarantees offered by DOE.

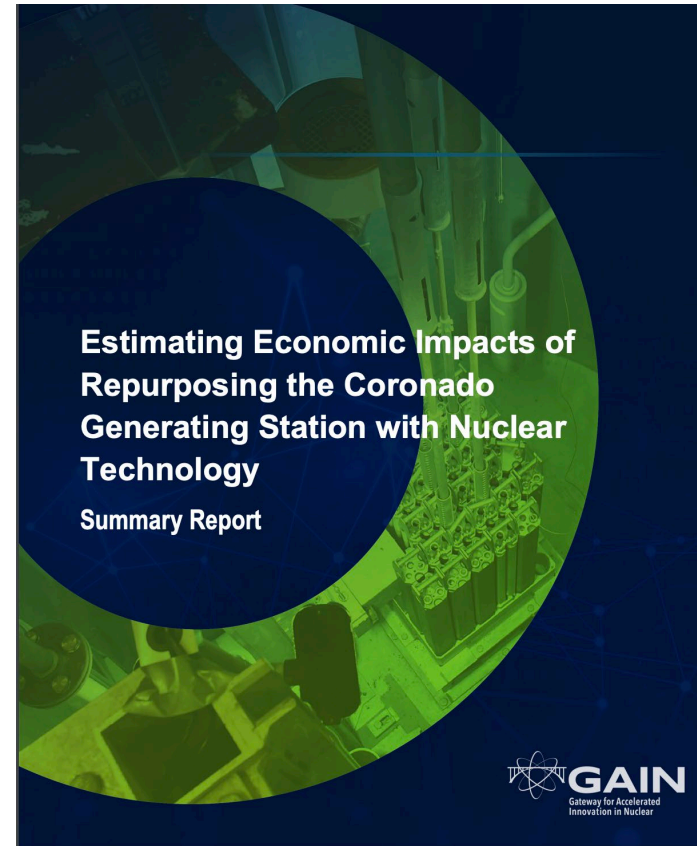
FEASIBILITY STUDIES & TECHNICAL ASSISTANCE

DOE's Gateway for Accelerated Innovation in Nuclear ([GAIN](#)) is working with coal communities and utilities to explore next steps for retiring sites:

- Coronado Generating Station in Saint Johns, AZ
- Ghent Generating Station in Carroll County, KY
- Colstrip Generating Plant in Colstrip, MT

GAIN is providing technical assistance to 5 communities exploring nuclear under DOE's [Community-LEAP program](#)

- Eastern Kentucky; Northwestern Colorado, CO; Rosebud and Treasure Counties, MT; Southwestern Pennsylvania, PA; Utah's Coal Country, UT





THANK YOU!

energy.gov/ne/coal-nuclear-transitions

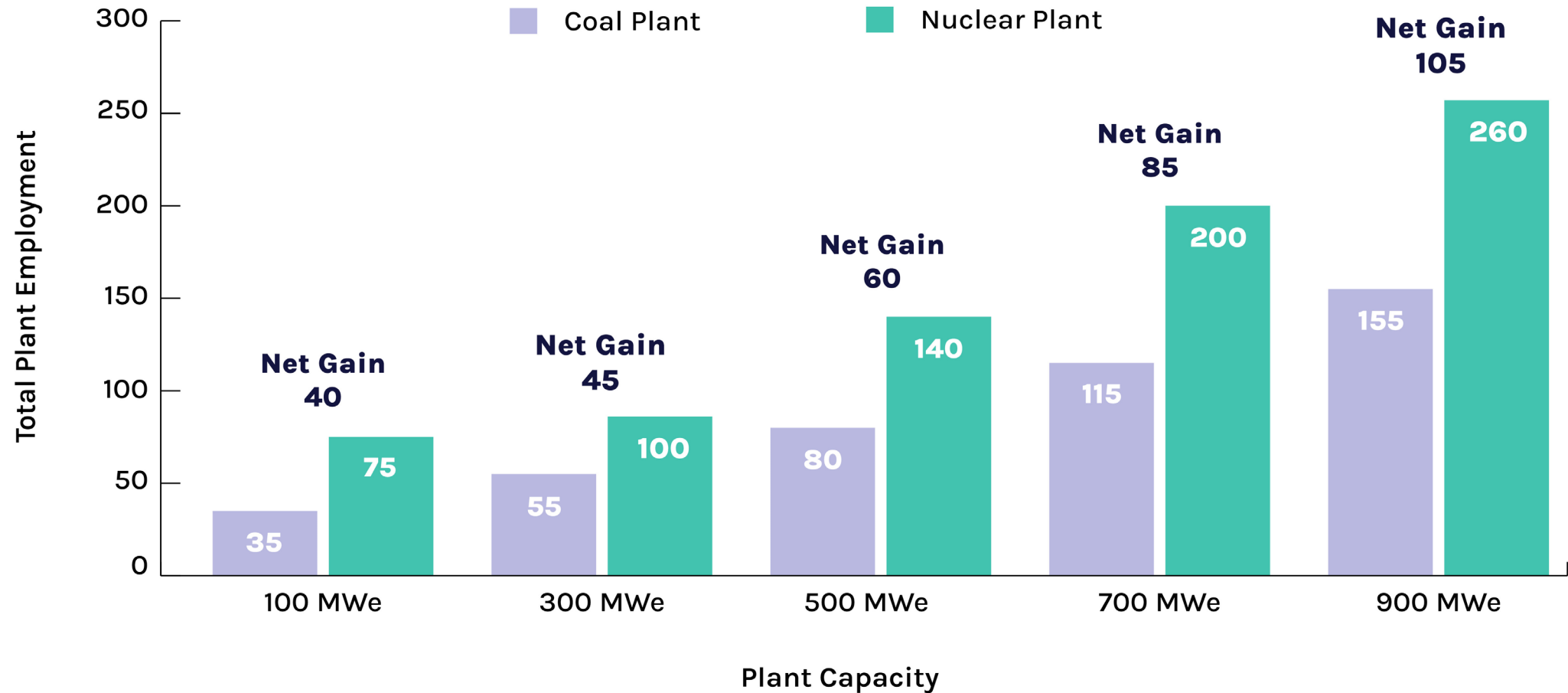
ADDED INCOME

	Population Range	< 20,000	20,000-39,999	40,000-89,999	90,000-199,999	200,000+
100 MWe	Income with Coal Plant	\$6.0 M	\$6.5 M	\$6.9 M	\$6.8 M	\$8.4 M
	Income with Nuclear Plant	\$14.6 M	\$15.5 M	\$16.2 M	\$16.4 M	\$20.0 M
	Added Income	\$8.6 M	\$9.0 M	\$9.3 M	\$9.6 M	\$11.6 M
300 MWe	Income with Coal Plant	\$10.9 M	\$12.0 M	\$12.8 M	\$13.0 M	\$17.1 M
	Income with Nuclear Plant	\$22.4 M	\$24.9 M	\$26.8 M	\$27.3 M	\$36.5 M
	Added Income	\$11.5 M	\$12.9 M	\$14.0 M	\$14.3 M	\$19.4 M
500 MWe	Income with Coal Plant	\$16.4 M	\$18.3 M	\$20.3 M	\$20.0 M	\$26.7 M
	Income with Nuclear Plant	\$32.8 M	\$36.9 M	\$40.0 M	\$40.9 M	\$55.9 M
	Added Income	\$16.4 M	\$18.6 M	\$19.7 M	\$20.9 M	\$29.2 M
700 MWe	Income with Coal Plant	\$23.5 M	\$26.1 M	\$28.9 M	\$28.4 M	\$37.9 M
	Income with Nuclear Plant	\$46.6 M	\$52.4 M	\$56.7 M	\$58.0 M	\$79.1 M
	Added Income	\$23.1 M	\$26.3 M	\$27.8 M	\$29.6 M	\$41.2 M
900 MWe	Income with Coal Plant	\$31.2 M	\$34.6 M	\$38.2 M	\$37.6 M	\$49.9 M
	Income with Nuclear Plant	\$60.5 M	\$67.8 M	\$73.5 M	\$75.0 M	\$102.2 M
	Added Income	\$29.3 M	\$33.2 M	\$35.3 M	\$37.4 M	\$52.3 M

ADDED REVENUE

	Population Range	< 20,000	20,000-39,999	40,000-89,999	90,000-199,999	200,000+
100 MWe	Revenue with Coal Plant	\$29.3 M	\$30.7 M	\$33.2 M	\$32.7 M	\$36.3 M
	Revenue with Nuclear Plant	\$57.4 M	\$61.0 M	\$64.4 M	\$64.7 M	\$74.1 M
	Added Revenue	\$28.1 M	\$30.3 M	\$31.2 M	\$32.0 M	\$37.8 M
300 MWe	Revenue with Coal Plant	\$86.3 M	\$90.2 M	\$95.0 M	\$96.0 M	\$105.6 M
	Revenue with Nuclear Plant	\$167.5 M	\$177.2 M	\$187.1 M	\$187.6 M	\$212.5 M
	Added Revenue	\$81.2 M	\$87.0 M	\$92.1 M	\$91.6 M	\$106.9 M
500 MWe	Revenue with Coal Plant	\$143.5 M	\$149.9 M	\$162.1 M	\$159.5 M	\$175.3 M
	Revenue with Nuclear Plant	\$278.3 M	\$294.2 M	\$310.6 M	\$311.3 M	\$352.0 M
	Added Revenue	\$134.8 M	\$144.3 M	\$148.5 M	\$151.8 M	\$176.7 M
700 MWe	Revenue with Coal Plant	\$201.0 M	\$210.0 M	\$227.1 M	\$223.4 M	\$245.6 M
	Revenue with Nuclear Plant	\$389.7 M	\$412.0 M	\$435.1 M	\$436.0 M	\$493.1 M
	Added Revenue	\$188.7 M	\$202.0 M	\$208.0 M	\$212.6 M	\$247.5 M
900 MWe	Revenue with Coal Plant	\$258.6 M	\$270.3 M	\$292.3 M	\$287.6 M	\$316.3 M
	Revenue with Nuclear Plant	\$501.1 M	\$529.9 M	\$559.5 M	\$560.7 M	\$634.3 M
	Added Revenue	\$242.5 M	\$259.6 M	\$267.2 M	\$273.1 M	\$318.0 M

NUMBER OF JOBS AT COAL PLANT V. NUCLEAR PLANT



NEW JOB ROLES

Occupation Code	Occupation Title	Jobs Gained
17-2161	Nuclear engineers	20
33-9032	Security guards	14
51-8011	Nuclear power reactor operators	14
19-4051	Nuclear technicians	14
51-1011	First-line supervisors of production and operating workers	7
49-2095	Electrical and electronics repairers, powerhouse, substation, and relay	4
49-1011	First-line supervisors of mechanics, installers, and repairers	4
49-9041	Industrial machinery mechanics	4
13-1151	Training and development specialists	4
17-2071	Electrical engineers	4

COAL-TO-NUCLEAR RESOURCES

DOE's Coal-to-Nuclear resource [page](#)

- [2022 DOE report](#) highlighting the opportunities and challenges as coal communities consider converting to nuclear
- [2024 DOE information guide](#) for energy communities exploring coal-to-nuclear transitions.

[Gateway for Accelerated Innovation in Nuclear \(GAIN\)](#) coal-to-nuclear community pilot studies

GAIN's Kentucky [story](#)

[Interagency Working Group](#) on Coal & Power Plant Communities & Economic Revitalization

