

AREVA is Clean Energy and American Jobs

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Introduction



- ▶ **AREVA Overview**
- ▶ **Nuclear Energy Overview**
- ▶ **A New Nuclear Plant in Ohio – What Does it Mean?**
- ▶ **Southern Ohio Clean Energy Park Alliance**
- ▶ **Conclusion**

AREVA Overview



AREVA: A Global Industrial Group Focusing on CO₂-Free Energy



» AREVA is #1 in nuclear and growing rapidly in renewables

AREVA in the World

75,000 Employees

43 countries

Production & Manufacturing

100 countries

Marketing & Sales

Two-thirds of AREVA's sales revenue
outside France

EUROPE AND CIS

57% of sales

68% of employees

Austria, Belgium, France, Germany, Greece, Hungary, Italy, Kazakhstan, the Netherlands, Norway, Poland, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, United Kingdom

NORTH AND SOUTH AMERICA

15% of sales

13% of employees

Argentina, Brazil, Canada, Chile, Colombia, Mexico, United States,

AFRICA AND MIDDLE EAST

9% of sales

5% of employees

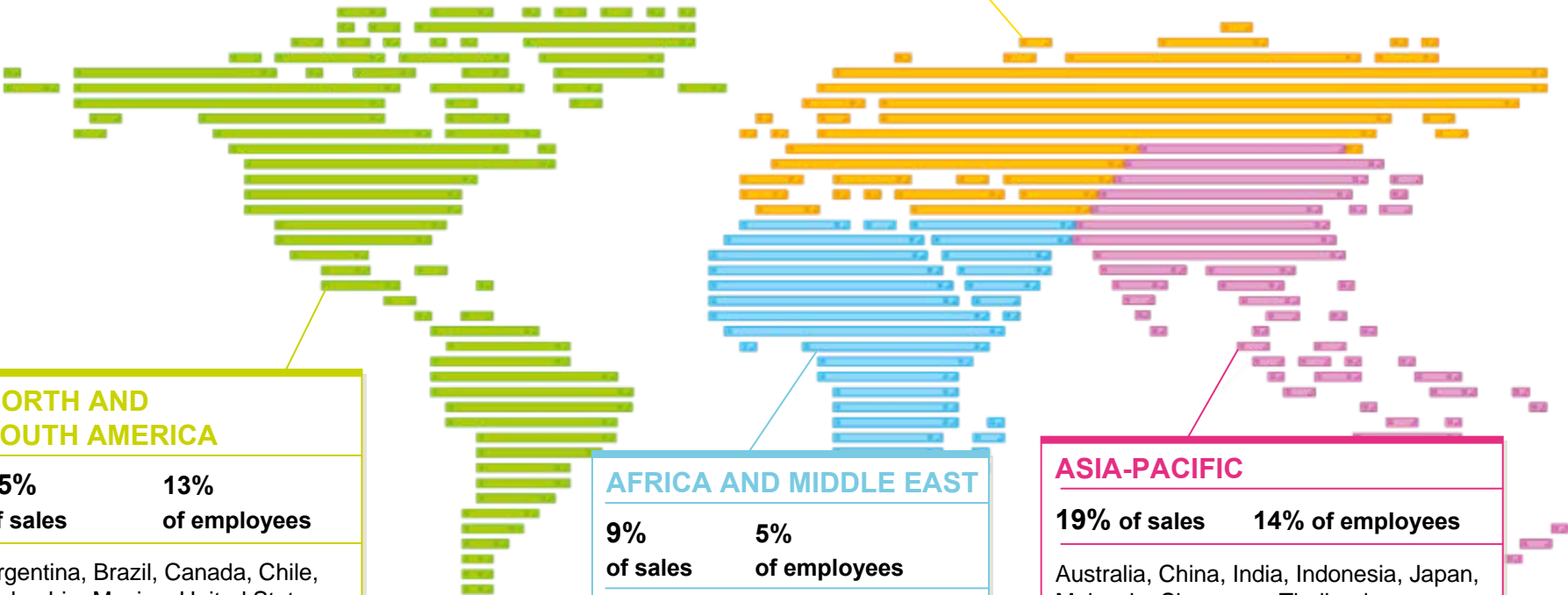
Central African Republic, Côte d'Ivoire, Egypt, Namibia, Niger, South Africa, United Arab Emirates

ASIA-PACIFIC

19% of sales

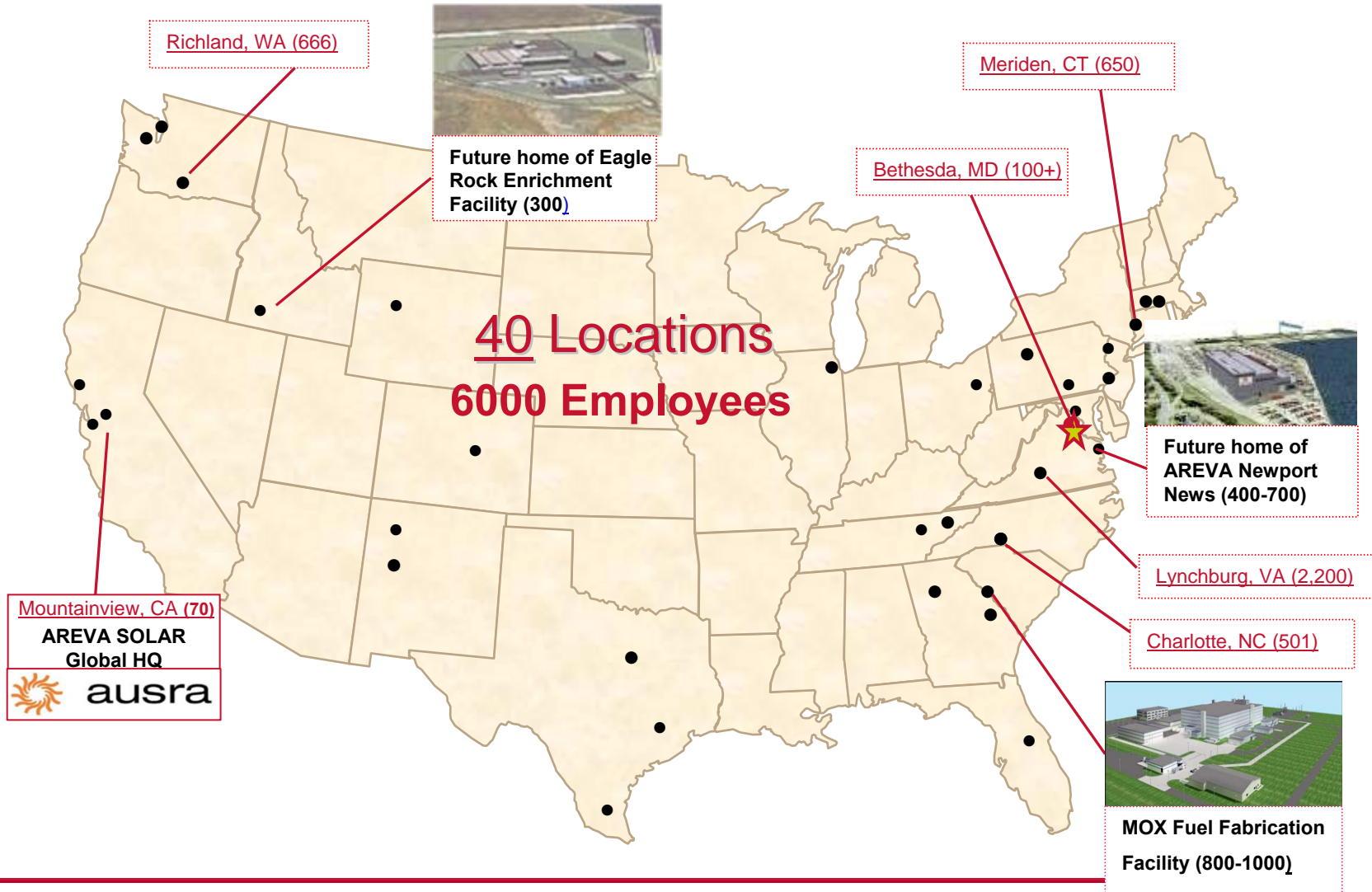
14% of employees

Australia, China, India, Indonesia, Japan, Malaysia, Singapore, Thailand



AREVA US Locations

HQ – Bethesda, Maryland



Renewable Energy: AREVA's Portfolio

WIND POWER



- ♦ Off-shore wind technology with strong position in targeted geographies – U.S.

BIOMASS



- ♦ Specialized Engineering, Procurement, Construction (EPC) company for biomass fired power plants
- ♦ Ownership of critical technologies (combustion, gasification, etc.)

SOLAR



- ♦ Specialized EPC for solar thermal power plants
- ♦ Research and development of solar technologies

ENERGY CARRIER AND STORAGE



- ♦ Fuel cell design and production
- ♦ Development of next generation storage solutions and hydrogen production

AREVA 5 MW Off-shore Wind Turbine

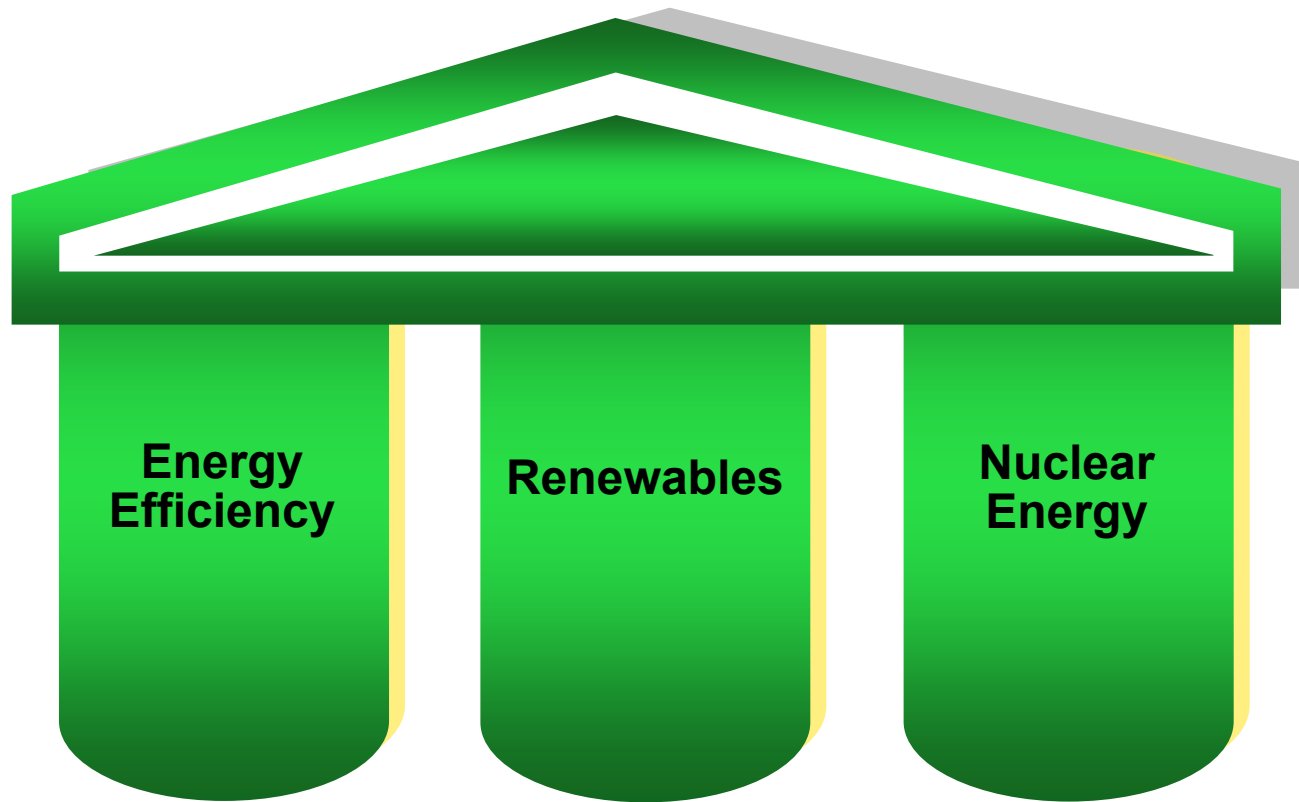


GOAL: To build and manufacture off-shore wind turbines in the U.S. for the U.S. market



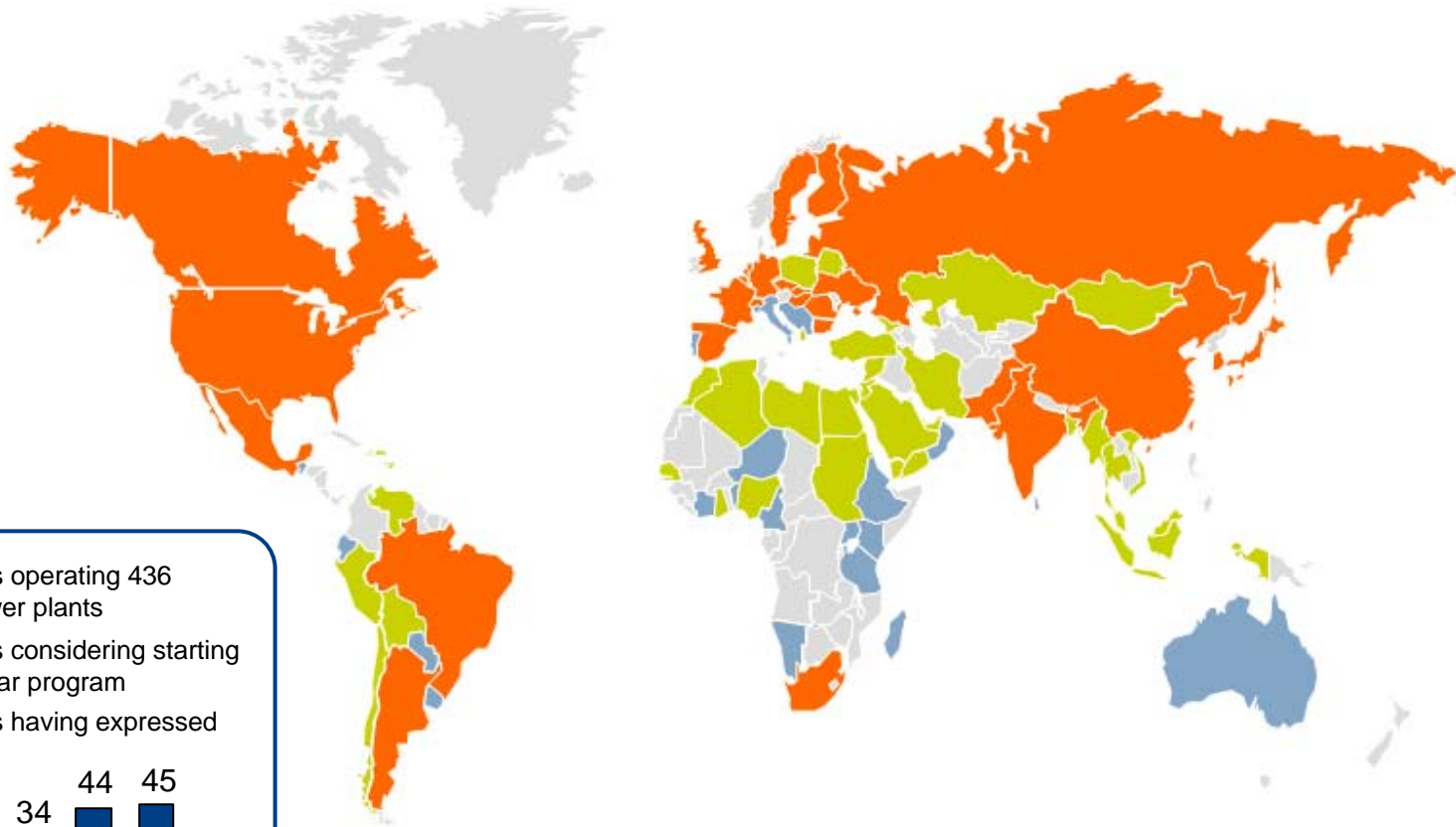
Nuclear Energy Overview

Three Pillars to Address Climate Change... None Sufficient by Itself

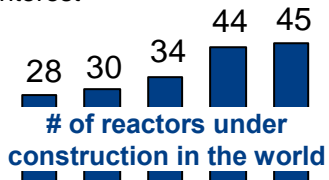


Nuclear – already a major contributor to CO₂-free baseload generation

Nuclear Energy is Global and a Revival is Underway



- 30 countries operating 436 nuclear power plants
- 43 countries considering starting a civil nuclear program
- 25 countries having expressed interest



2005 2006 2007 2008 2009

More than 20 EPR™ Reactor Projects under Development Worldwide

- Under construction
- Under development
- Prospects

+ 4 UK

- ▶ 4 units announced by EDF
- ▶ 4 units targeted with E.ON/RWE
- ▶ Further units GDF SUEZ/Iberdrola/SSE
- ▶ Industrial partnerships with Balfour Beatty and Rolls Royce covering engineering, manufacturing and construction

1 FINLAND

- ▶ OLKILUOTO 3 under construction

1 FRANCE

- ▶ FLAMANVILLE 3 under construction

2 CHINA

- ▶ TAISHAN 1&2, 2 units under construction

+ 1 USA

- ▶ Design Certification Application submitted in Dec. 2007 and expected by 2012
- ▶ Detailed Design underway
- ▶ 4 Combined License Applications referenced by NRC
- ▶ Duke Energy is currently evaluating the EPR™ technology for the Piketon, Ohio site

+ 1 FRANCE

- ▶ Second EPR™ project for EDF, GDF SUEZ, Total, Enel and possibly E.ON in Penly
- ▶ Possible 3rd EPR™ project under discussion

4 ITALY

- ▶ 4 units announced by EDF and Enel through the JV SNI
- ▶ Further potential units with European utilities that have declared interest in contributing to the Italian nuclear program; no formal set-up yet

+ 4 INDIA

- ▶ Memorandum of Understanding with NPCIL for 6 EPR™ reactors at the Jaitapur site; offer for 2 EPR™ reactors
- ▶ Strategic alliance with Bharat Forge
- ▶ Framework agreement with TCE Consulting Engineers (Tata) for engineering services
- ▶ Licensing launched

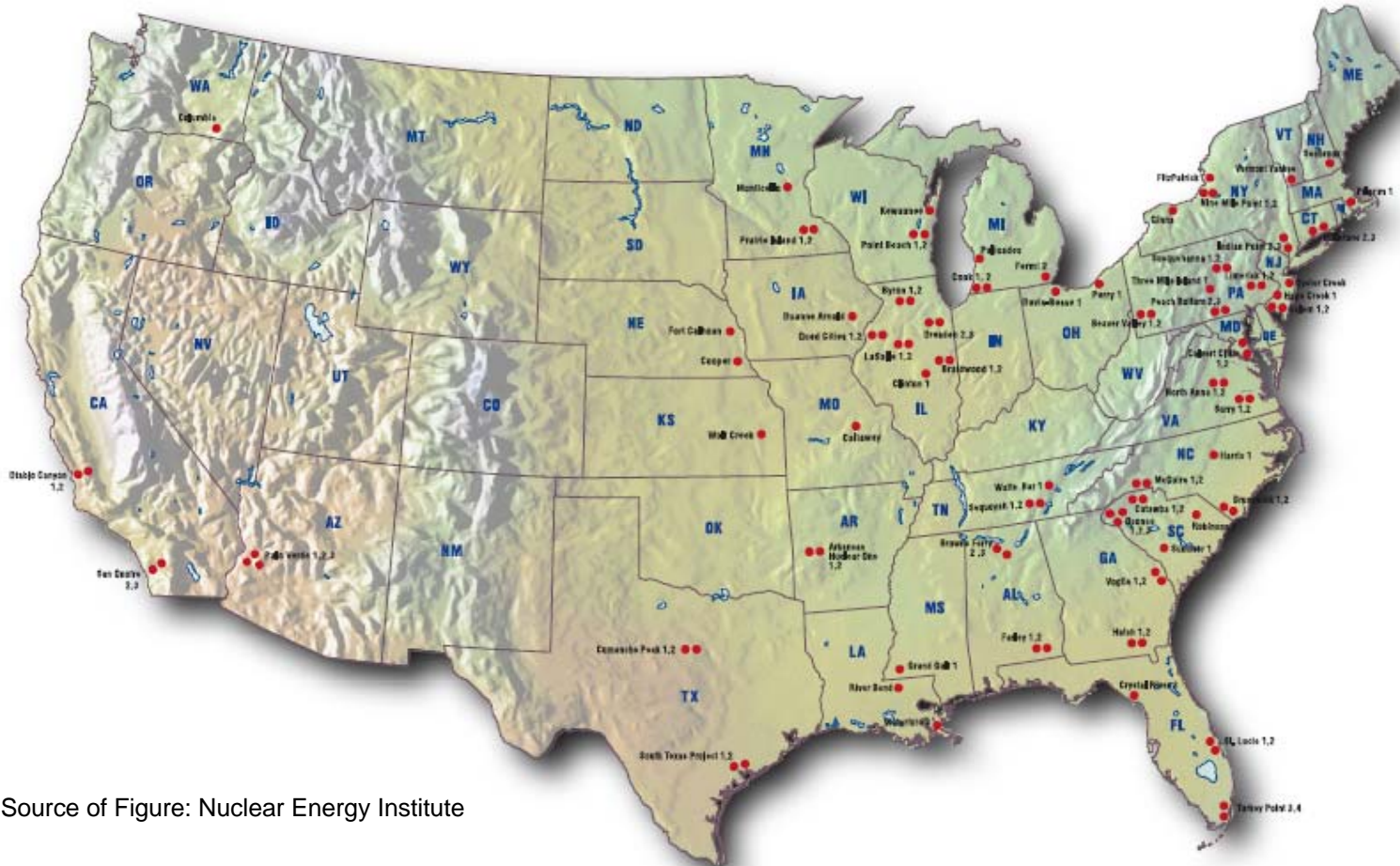
REPUBLIC OF SOUTH AFRICA (RSA)

- ▶ RSA is speaking about a fleet approach (Integrated Resource Plan) with about 10,500MWe by 2018 and 21,000 MWe by 2035
- ▶ Localization will be a key issue

PROSPECTS

- ▶ Brazil, Canada, China, Czech Republic, Finland, Lithuania, Poland, Switzerland, the Netherlands

U.S. Nuclear Power Plants

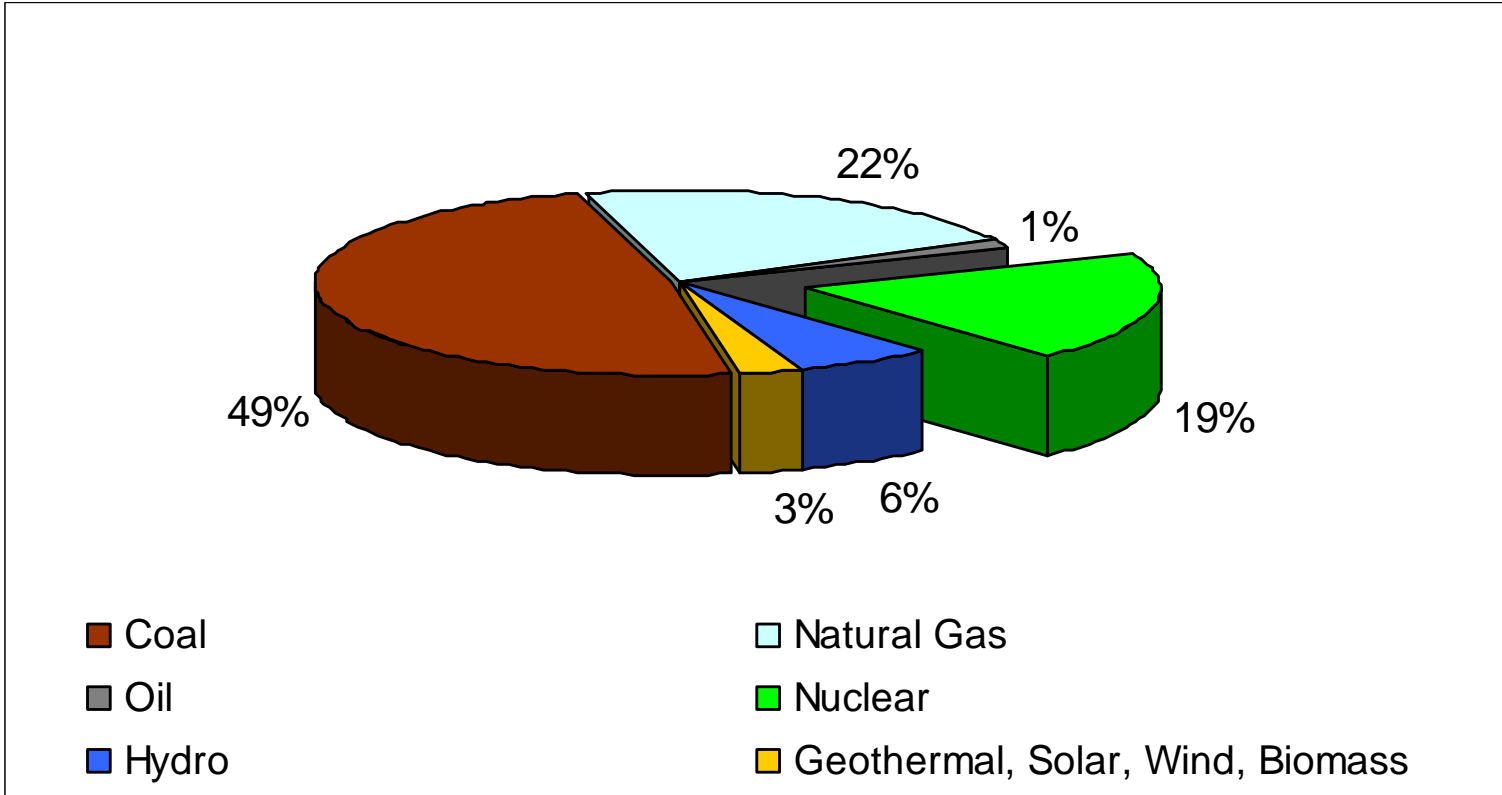


Source of Figure: Nuclear Energy Institute



There are 104 current operating reactors at 65 sites in 31 states

U.S. Sources of Electricity

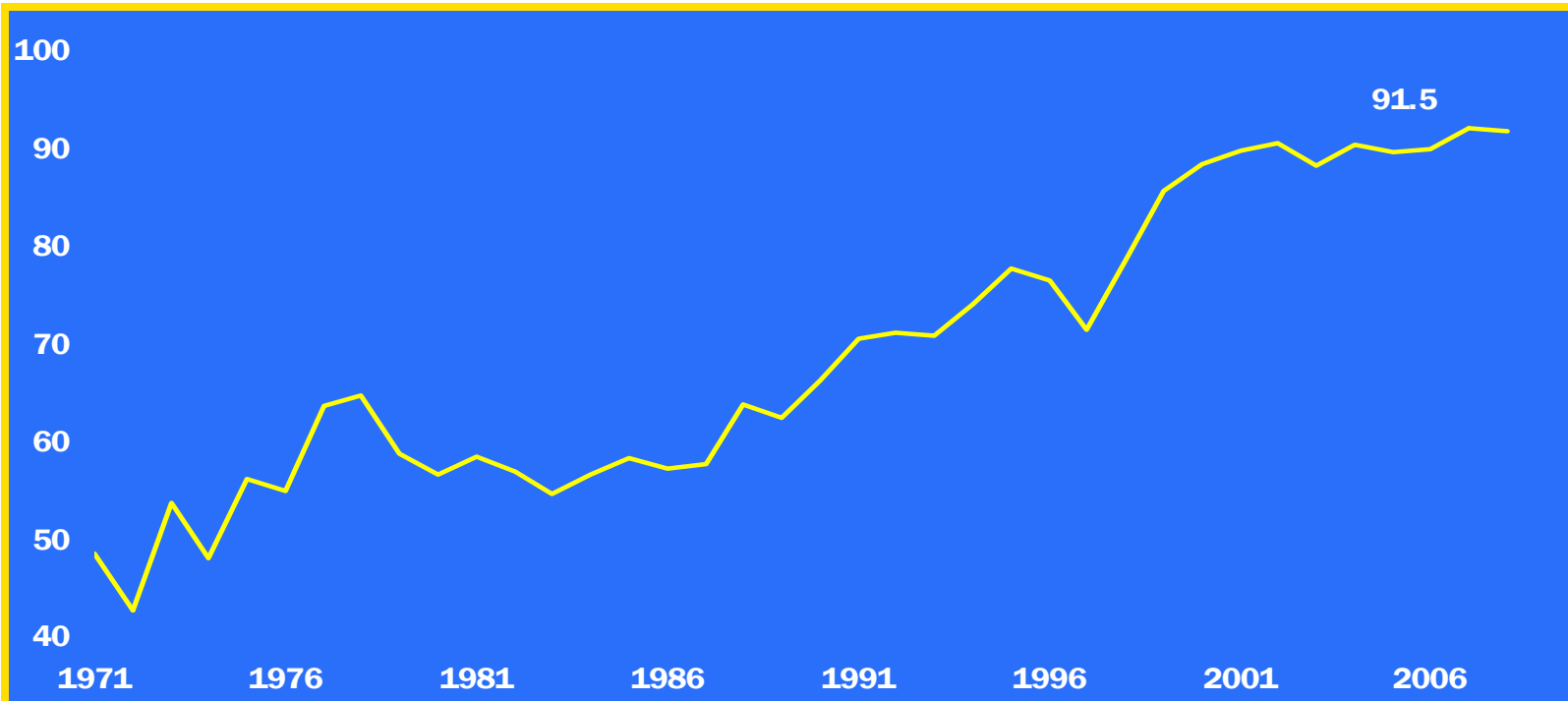


Data Source: Energy Information Administration, Annual Energy Report 2008



Nuclear power plants provide about 19% of our electricity

U.S. Nuclear Industry Capacity Factors



Source of Figure: Nuclear Energy Institute



Nuclear power is now a very reliable source of base load electricity, and performance has improved dramatically

U.S. Capacity Factors by Fuel Type

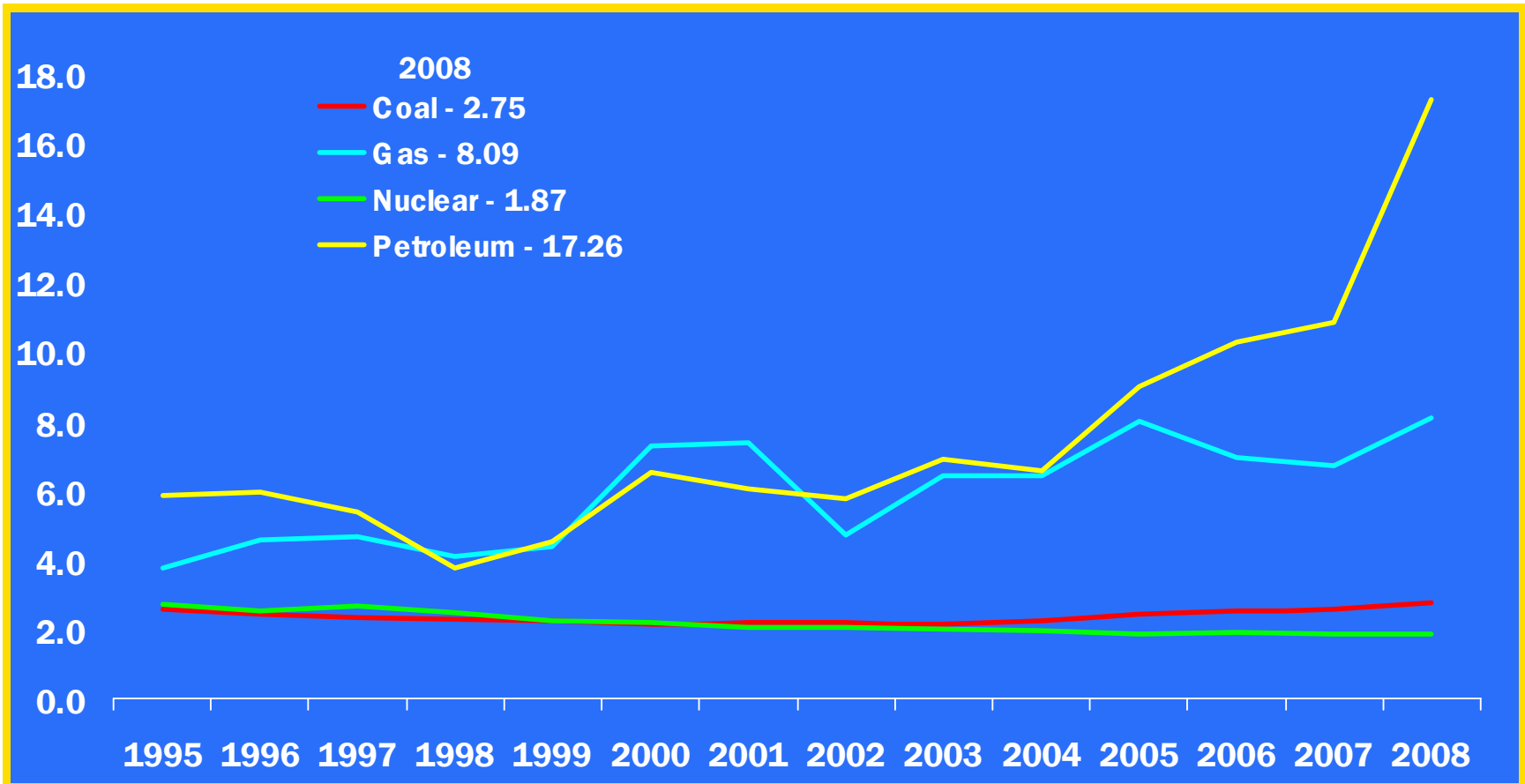
Fuel Type	Average Capacity Factors (%)
Nuclear	91.5
Coal (Steam Turbine)	70.8
Gas (Combined Cycle)	41.7
Gas (Steam Turbine)	14.6
Oil (Steam Turbine)	12.6
Hydro	27.4
Wind	31.1
Solar	21.1

Source: Nuclear Energy Institute



Nuclear power has the highest on-line availability

U.S. Electricity Production Costs (\$0.01/kw-hr)

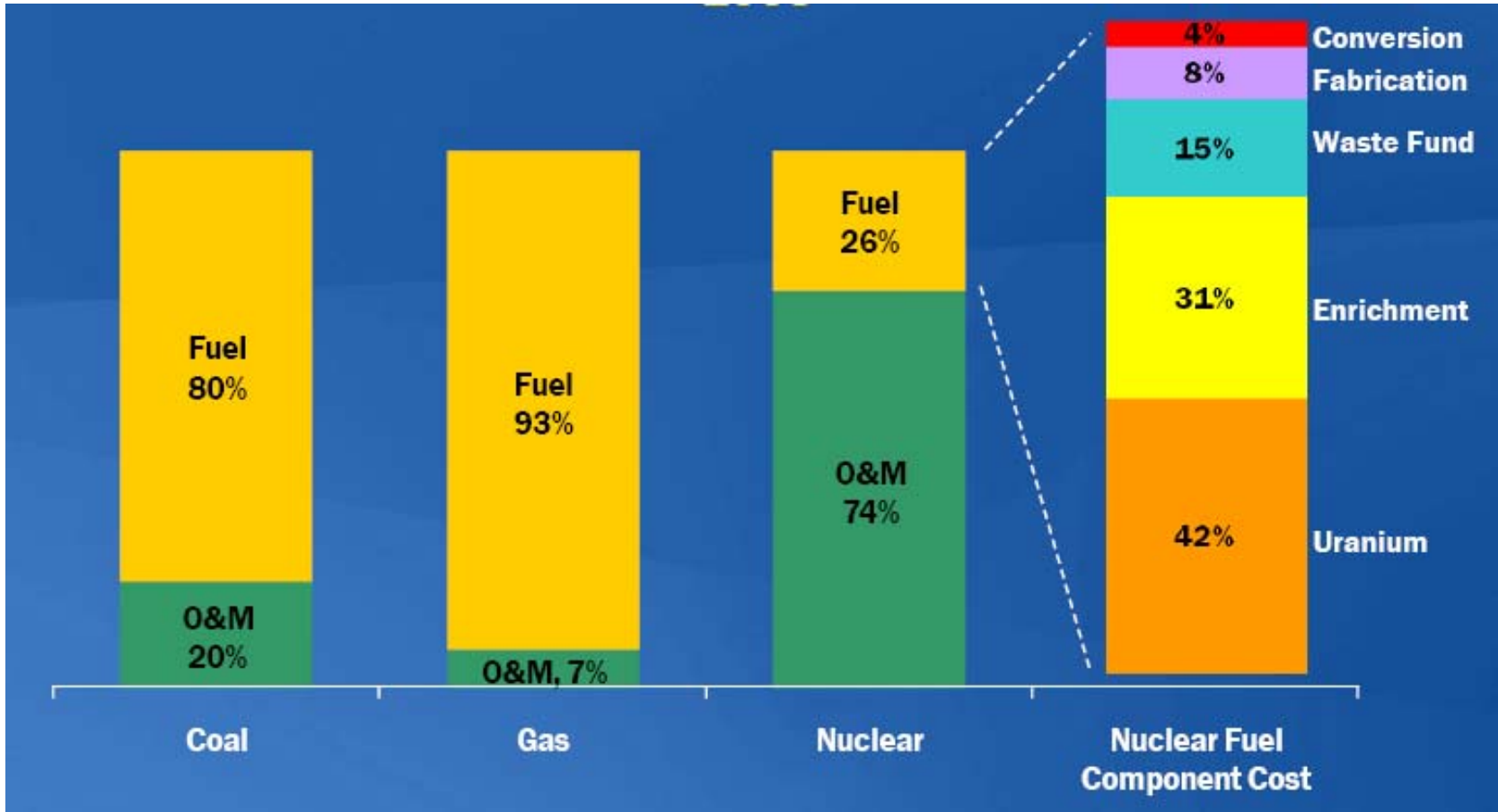


Source: Nuclear Energy Institute



Since 2000, nuclear power has the lowest production costs

Fuel as a Percentage of Production Cost



Source: Nuclear Energy Institute



Nuclear power production costs are less sensitive to fuel costs

New Baseload Plant Cost Estimates

Levelized Cost of Baseload Electricity				
Technology	Nuclear with risk premium	Nuclear w/o risk premium	Coal	Gas
Capital Cost (\$2007/kW)	4,000	4,000	2,300	850
Fuel (\$2007/mmBtu)	0.67	0.67	2.60	7.00
Weighted average cost of capital (WAAC)	10%	7.8%	7.8%	7.8%
Levelized Cost (¢/kWe)	8.4	6.6	6.2	6.5
Levelized Cost (¢/kWe) with \$25/tCO ₂			8.3	7.5

Source: Massachusetts Institute of Technology, "Update on the Cost of Nuclear Power," May 2009

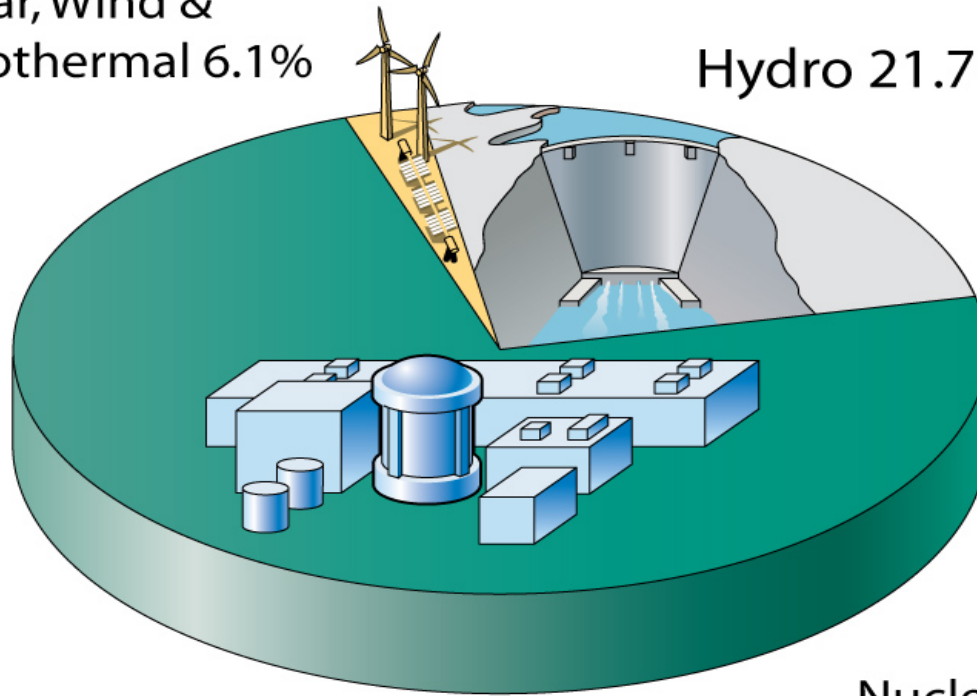


Advanced nuclear plants are competitive in all scenarios assuming they can be built on schedule and on budget

U.S. Sources of Emission-free Electricity

Solar, Wind &
Geothermal 6.1%

Hydro 21.7%



Nuclear 72.3%

Source: Nuclear Energy Institute



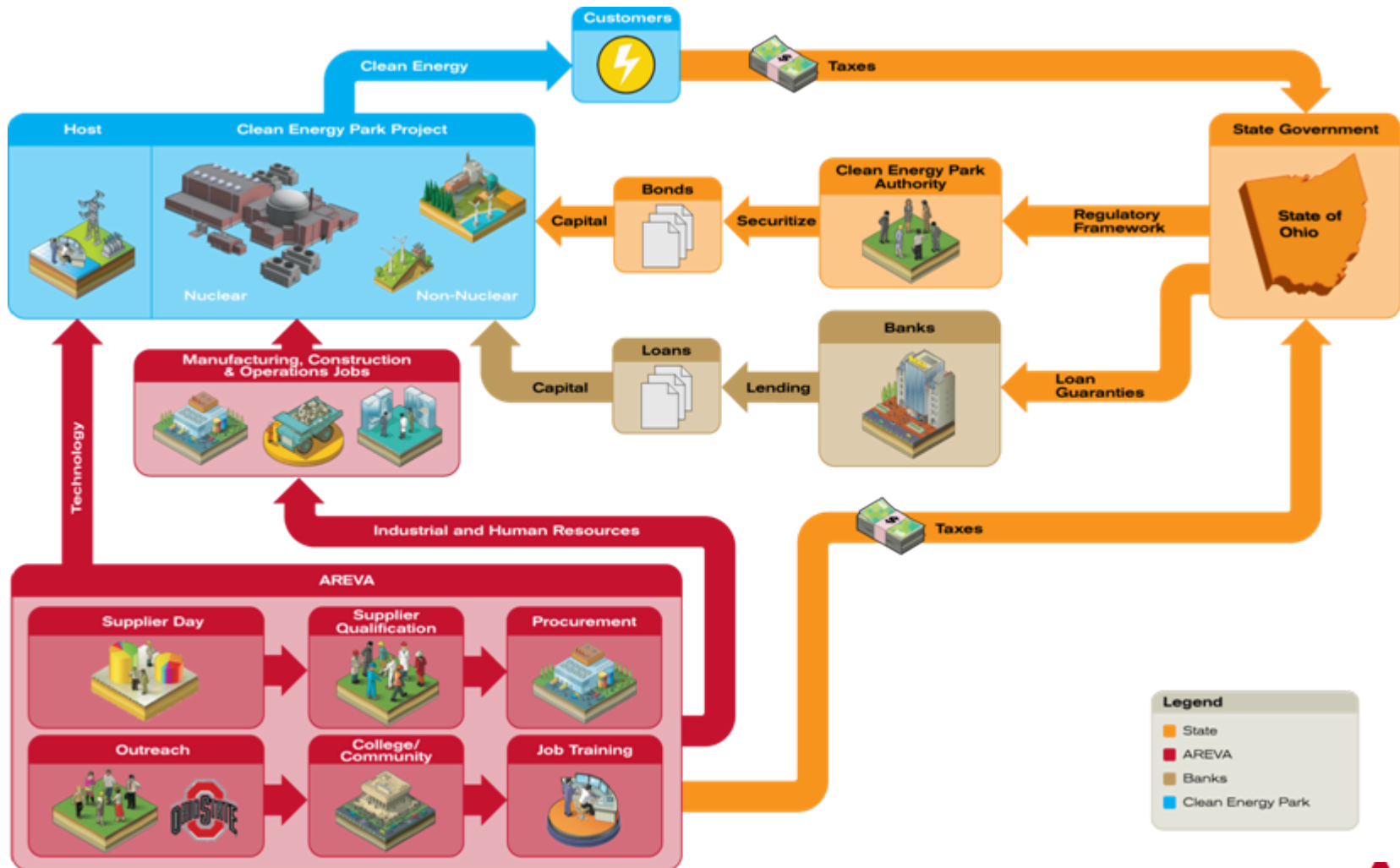
Nuclear power provides the largest source of emission-free electricity

A New Nuclear Plant in Ohio

What Does it Mean?



Jobs + Manufacturing + Education + Tax Revenues = Sustainable Development





Clean Energy Jobs

<u>New Jobs</u>	<u>Year 1</u>	<u>Highest Year</u>	
Direct	820	3,000	Site construction workers
Indirect	593	2,168	Ohio vendors for equipment and services
<u>Induced</u>	<u>688</u>	<u>2,516</u>	Service jobs created in food, hotel, entertainment and other industries
Total	2,102	7,684	



Based on detailed analysis of the Piketon site



Payroll Tax Revenue

	<u>Year 1</u>	<u>Highest Year</u>
Federal	\$30.1M	\$110.2M
State and Local	<u>\$15.9M</u>	<u>\$57.9M</u>
Total	\$46.0M	\$168.1M

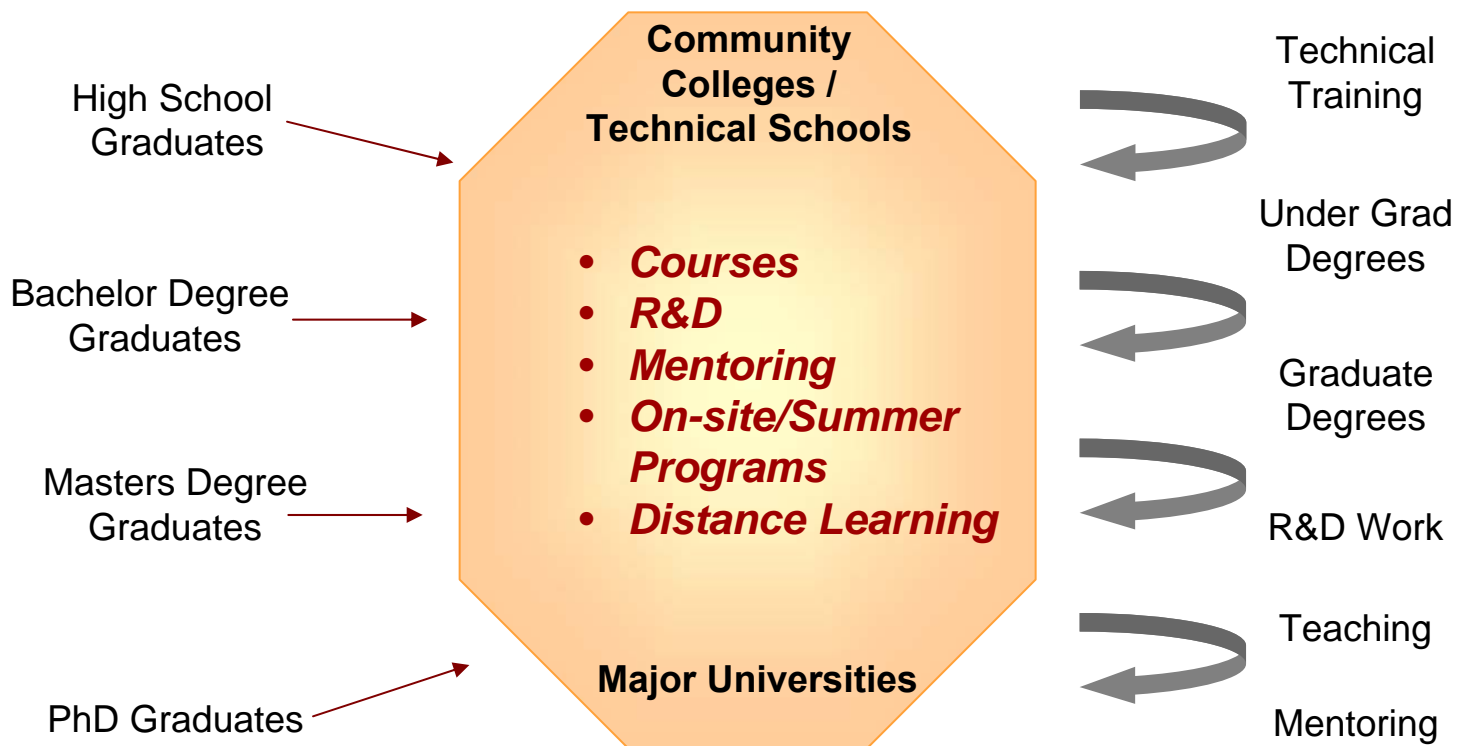


>\$832M in federal, state and local taxes during construction



Virtual University

Provide access to educational opportunities for all levels of employees throughout their careers



Matching people and careers in Ohio

AREVA EPR™ Supplier Days in MD and OH



>200 attendees from >100 companies at each event



Southern Ohio Clean Energy Park Alliance



Southern Ohio Clean Energy Park Concept

- ▶ On June 18th the Southern Ohio Clean Energy Park Alliance was formed to promote and pursue the development of a Clean Energy Park demonstration project at the U.S. Department of Energy's (DOE) Piketon, Ohio site.
- ▶ The clean energy park concept builds upon a DOE initiative to transform former weapons sites into energy parks focused on future clean energy production.
- ▶ Such initiatives would allow reuse of existing assets, aid in the cleanup of these sites, and support sustainable economic development for their respective regions.
- ▶ Initial focus is to support deployment of a Generation III+ nuclear power reactor, including environmental assessments of the site and development of licensing documents for submittal to the NRC.



Completed detailed plan and pursuing early site activities

Southern Ohio Clean Energy Park Alliance



Nuclear plant owner;
licensee & applicant
on submittals to NRC



Global nuclear services/
technology provider;
Piketon site experience
(DUF₆ facility)



Piketon site expertise;
site environmental &
licensing experience;
site lease



Nuclear plant licensing
expertise; potential
plant equity partner

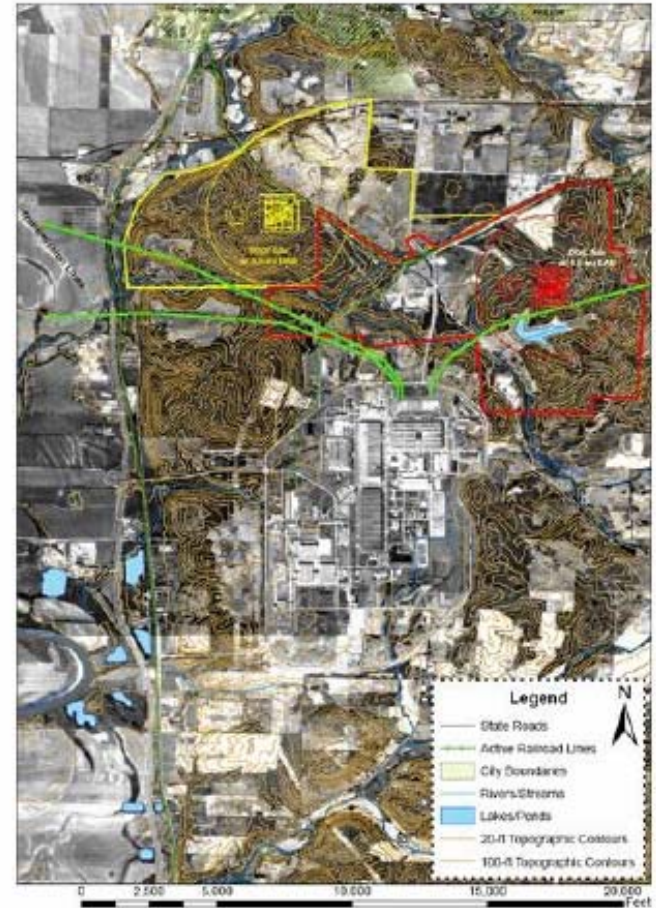


Recognized DOE-EM
community reuse
organization for
Piketon site

Why Piketon?

- ▶ Adjacent to Duke Energy Midwest service territory
- ▶ Positive Attributes
 - ◆ Recently approved NRC licensing documents
 - ◆ Transmission capability
 - ◆ Emergency & Security plans in place
 - ◆ Availability of key data sets used in a COL
 - Meteorological & climatological
 - Hydrological surface & groundwater
 - Geotechnical & seismic
 - ◆ Presence of highly skilled workforce and supporting infrastructure

PORTS Reservation
Aerial Photography Layout with US EPR Siting



Why the U.S. EPR™ Reactor?

▶ Safety Certainty

- ◆ Designed for 21st century safety
- ◆ Aircraft crash protection
- ◆ Severe accident mitigation

▶ Energy Supply Certainty

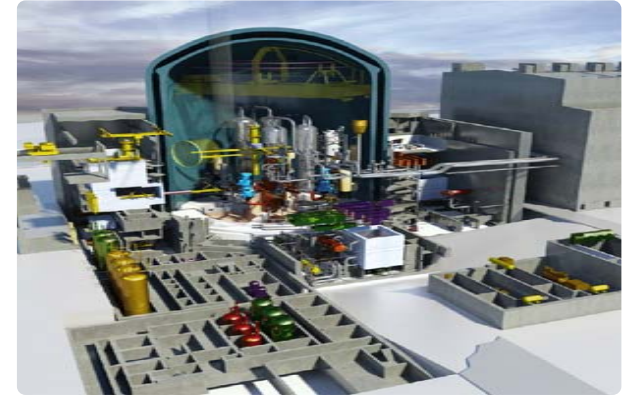
- ◆ High 1,600 MWe power output
- ◆ High capacity factor
- ◆ High thermal efficiency

▶ Licensing Certainty

- ◆ Evolutionary design
- ◆ Active and passive safety systems

▶ Project Certainty

- ◆ The first Generation III+ reactor being built
- ◆ Vertically integrated supply chain
- ◆ Made in America



▶ Best Value

- ◆ Predictable construction cost
- ◆ Stable production cost
- ◆ Lowest fuel cost
- ◆ Low water usage
- ◆ Low land usage per KWe
- ◆ High public acceptance



The U.S. EPR™ Reactor is the Path to Greatest Certainty

Conclusion

Conclusion

- ▶ **Nuclear electricity consumption to double by 2030**
 - ▶ **Global nuclear revival is underway creating jobs worldwide**
 - ▶ **AREVA is investing in the U.S. creating U.S. jobs**
 - ▶ **Federal and state support needed to make SOCEPA project in Piketon a reality**
- » **AREVA is creating highly skilled high-paying jobs for Americans in support of clean energy and energy security**