

# Nuclear Power and the Environment

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# Agenda

- Exelon as a company
- Nuclear Power Basics
- Nuclear Fuel and Reactor Core
- Nuclear Industry
- Nuclear Power & the Environment
- Dry Cask Storage
- Career/Internship Opportunities



# Exelon® by the numbers

#1

COMPETITIVE ENERGY PROVIDER IN THE U.S.

23 Nuclear Reactors

1.1 MILLION CONSTELLATION CUSTOMERS

6.6 MILLION UTILITY CUSTOMERS

\$72.2 BILLION IN ASSETS 

ALMOST

35,000

MEGAWATTS OF OWNED POWER GENERATION

47 STATES WHERE EXELON OPERATES



100%  
Corporate Equality Index



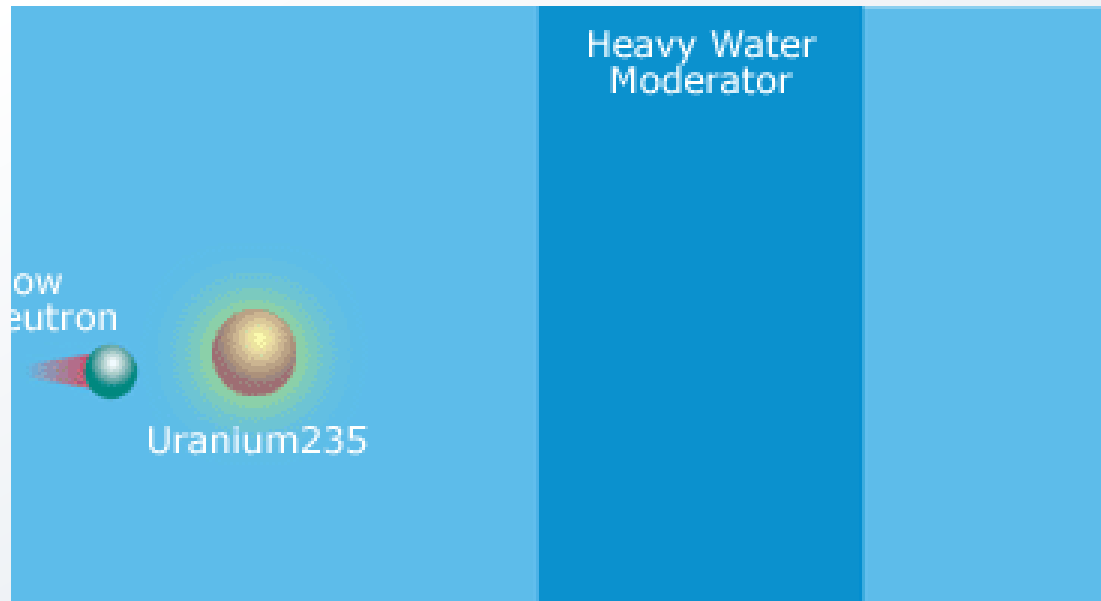
Exelon®

# Nuclear Physics & Electricity Generation

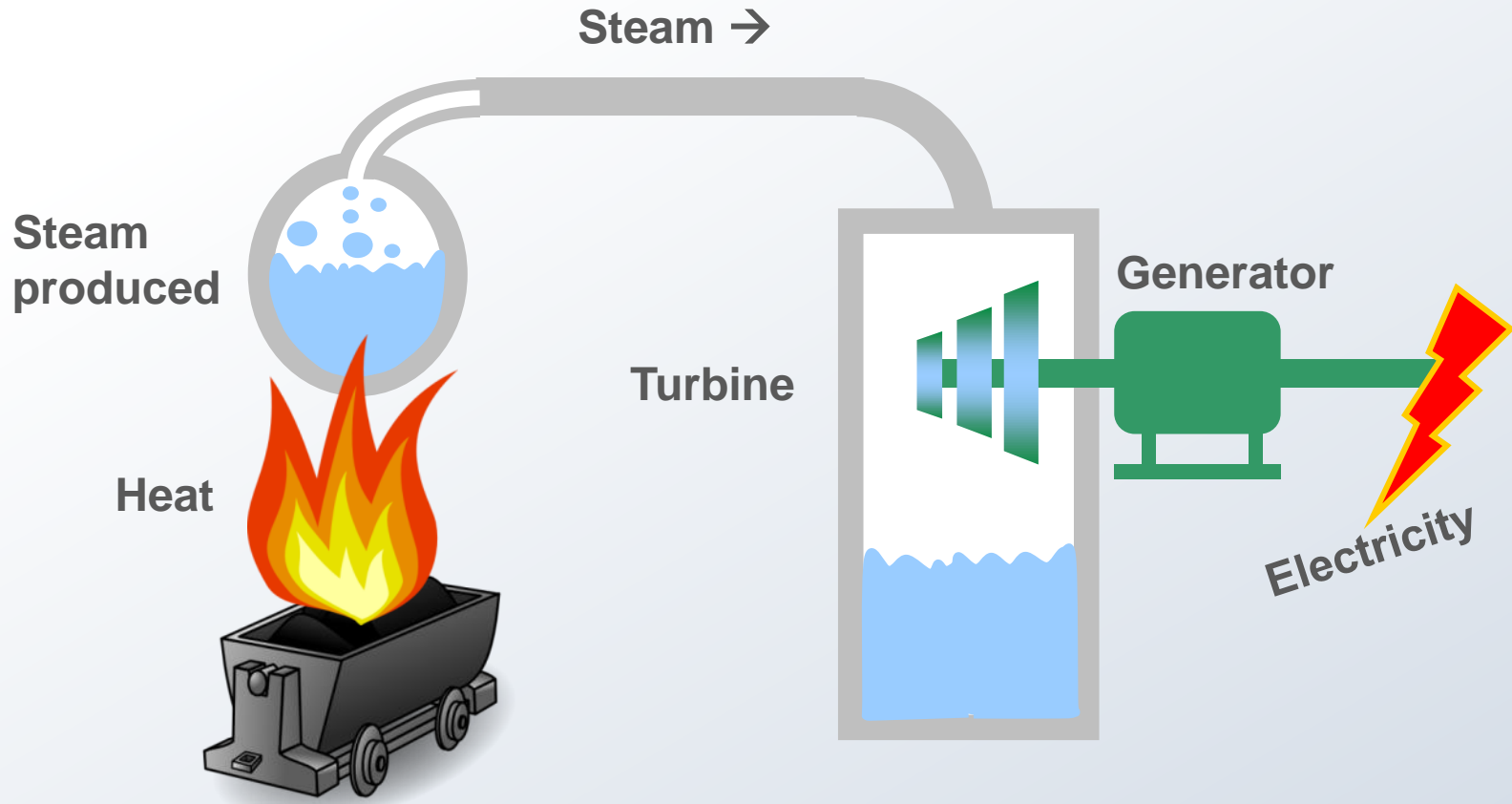
# Nuclear Fission



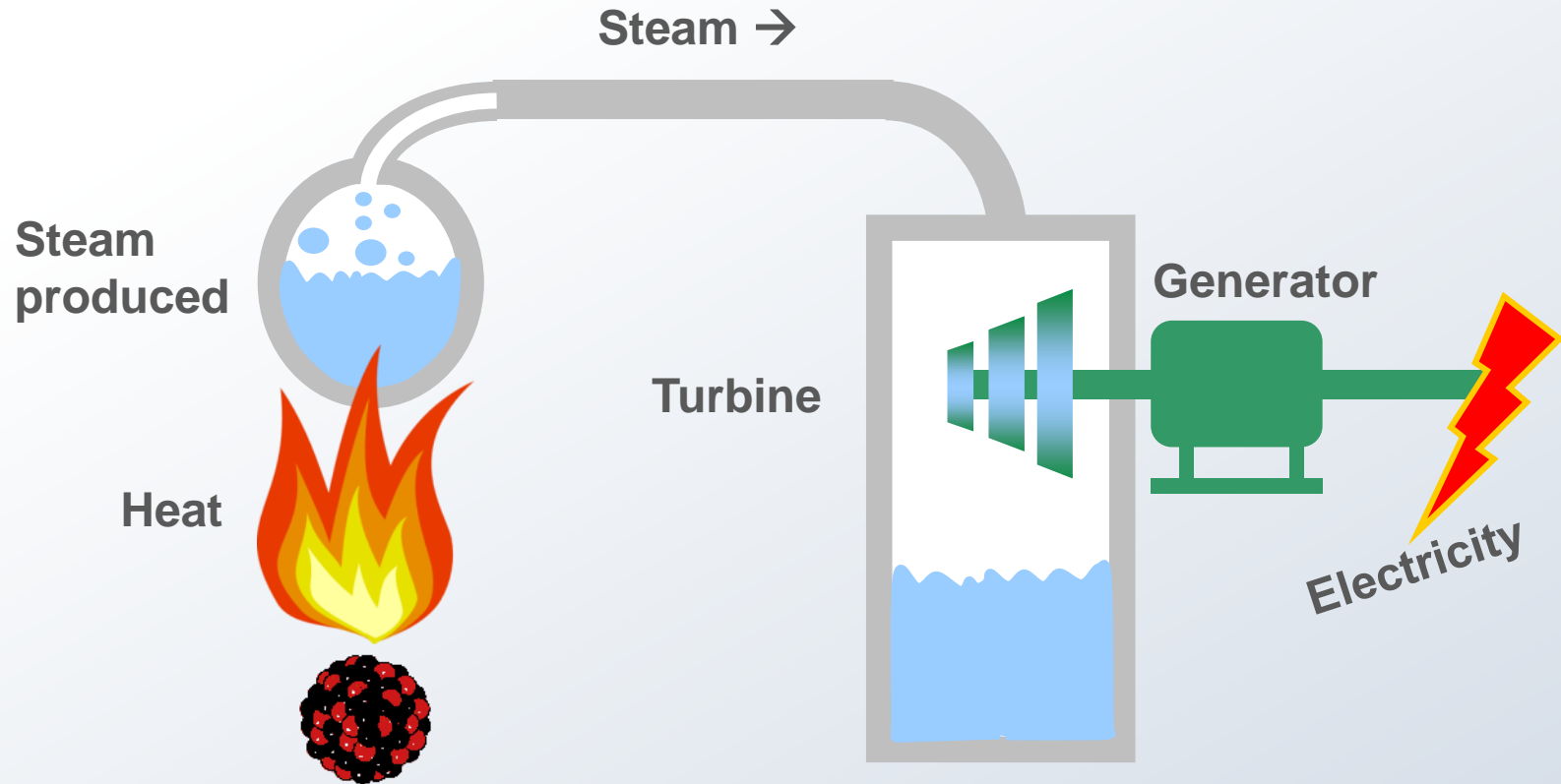
# Nuclear Chain Reaction



# Generating Electricity - Fossil Fuel

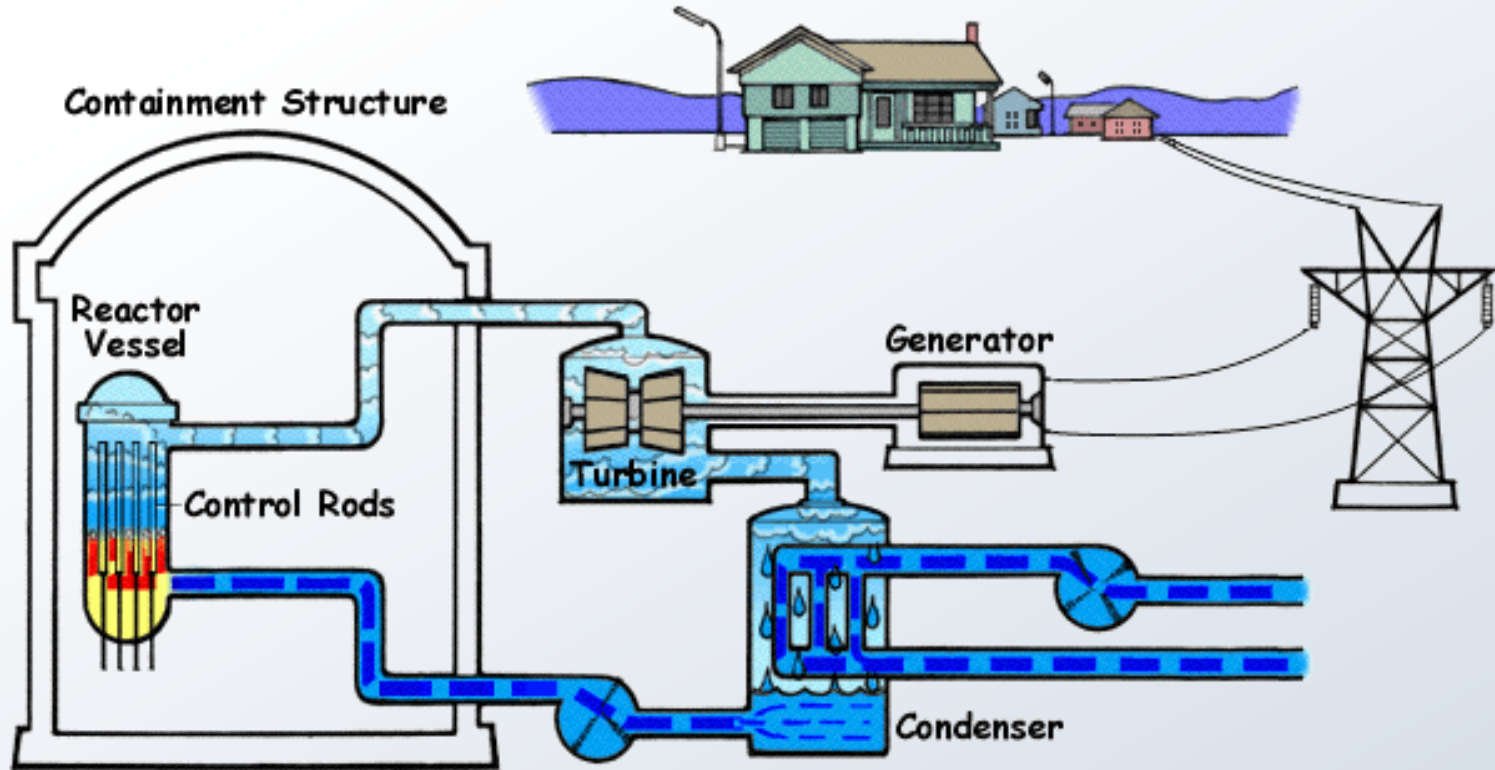


# Generating Electricity - Nuclear



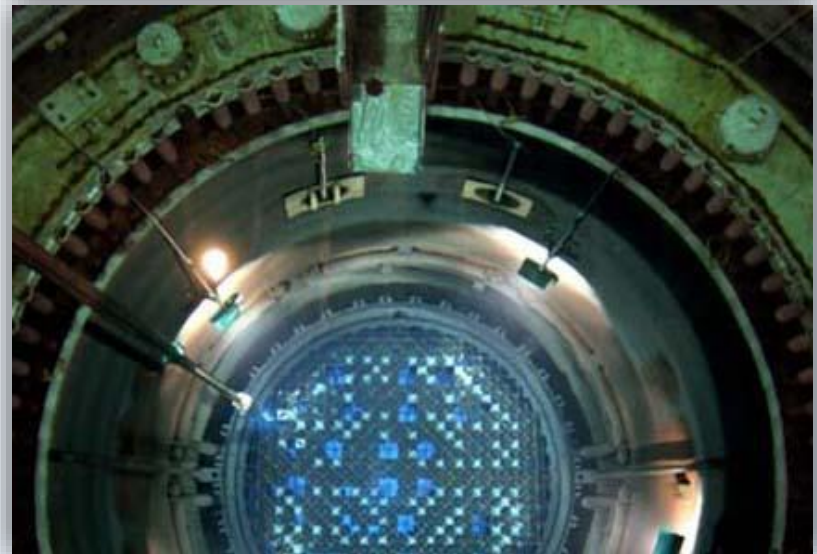
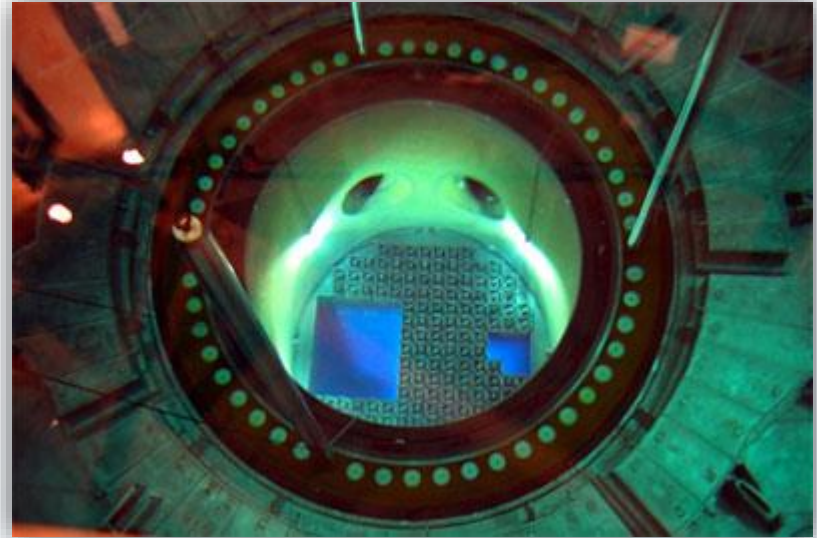
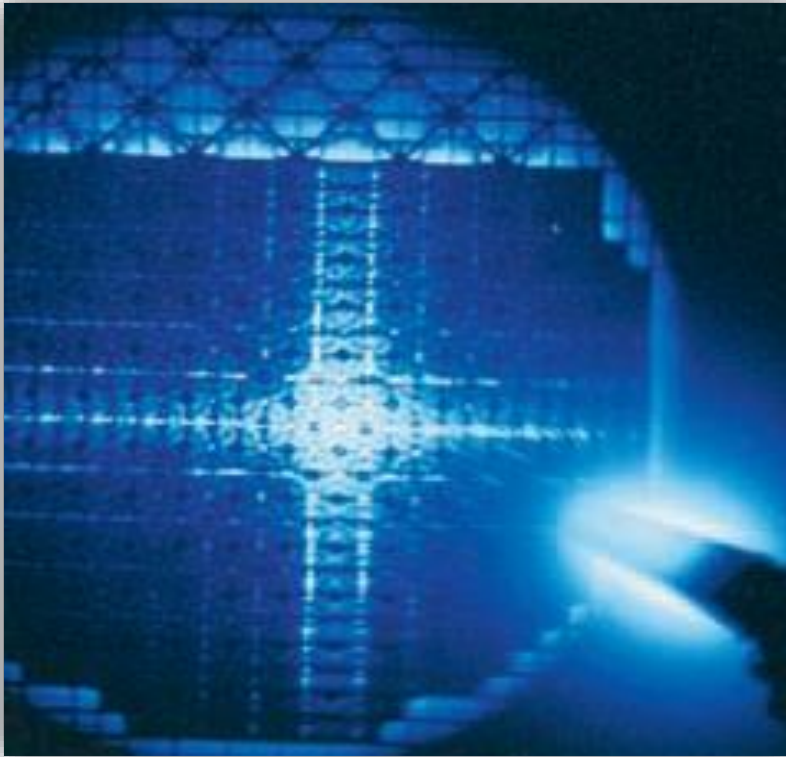


# Generating Electricity

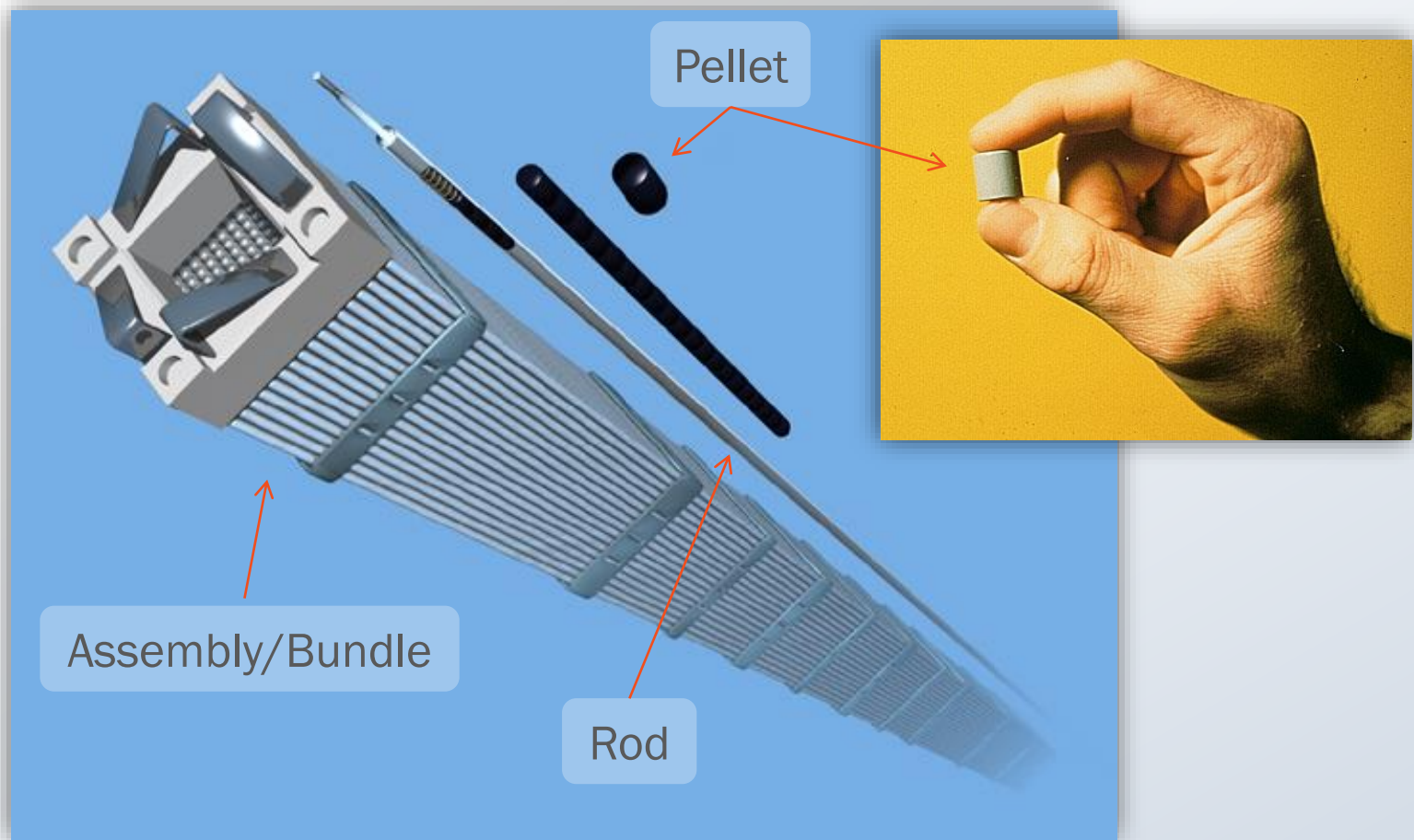


# Nuclear Fuel & Reactor Core

# Reactor Core



# Nuclear Fuel



# Energy Equivalents



1 Uranium fuel pellet



3 barrels of oil, 126 gals

1 cord of wood, 5000 lbs



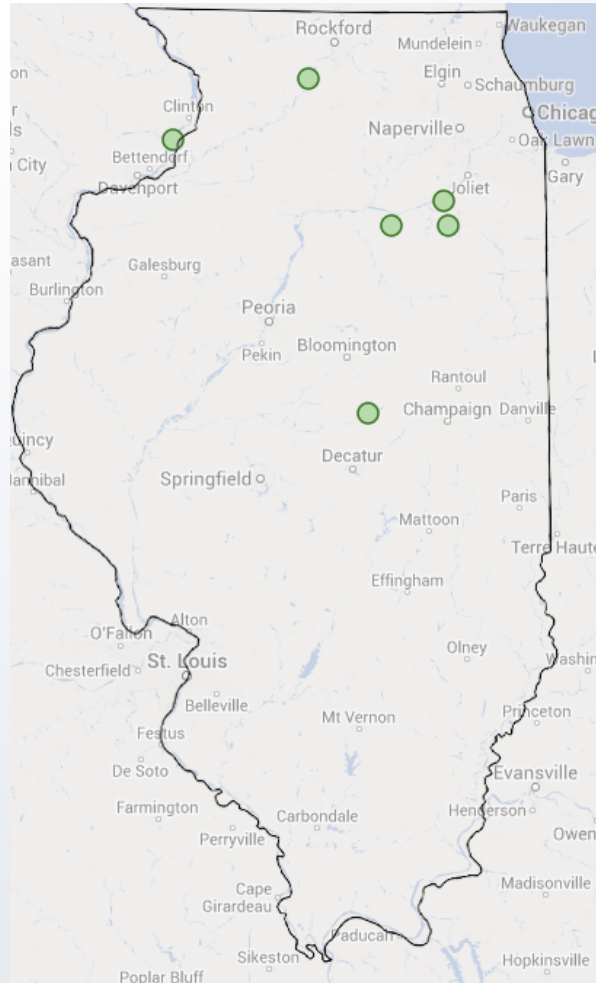
17,000 ft<sup>3</sup> of natural gas



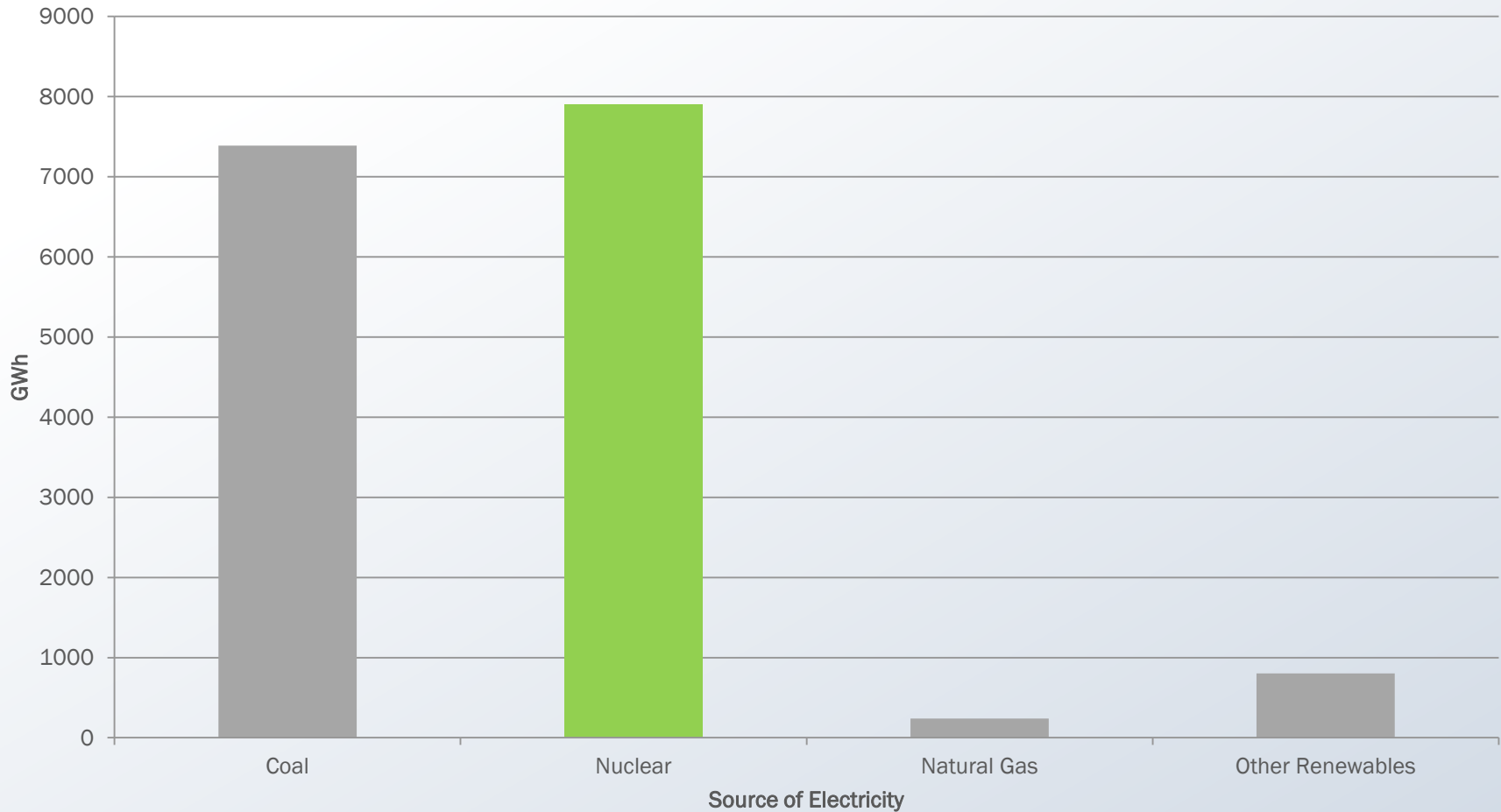
1 ton of coal, 2000 lbs

# Nuclear Industry (Illinois, USA & World)

# Nuclear Power in Illinois



# Illinois Electricity Generation

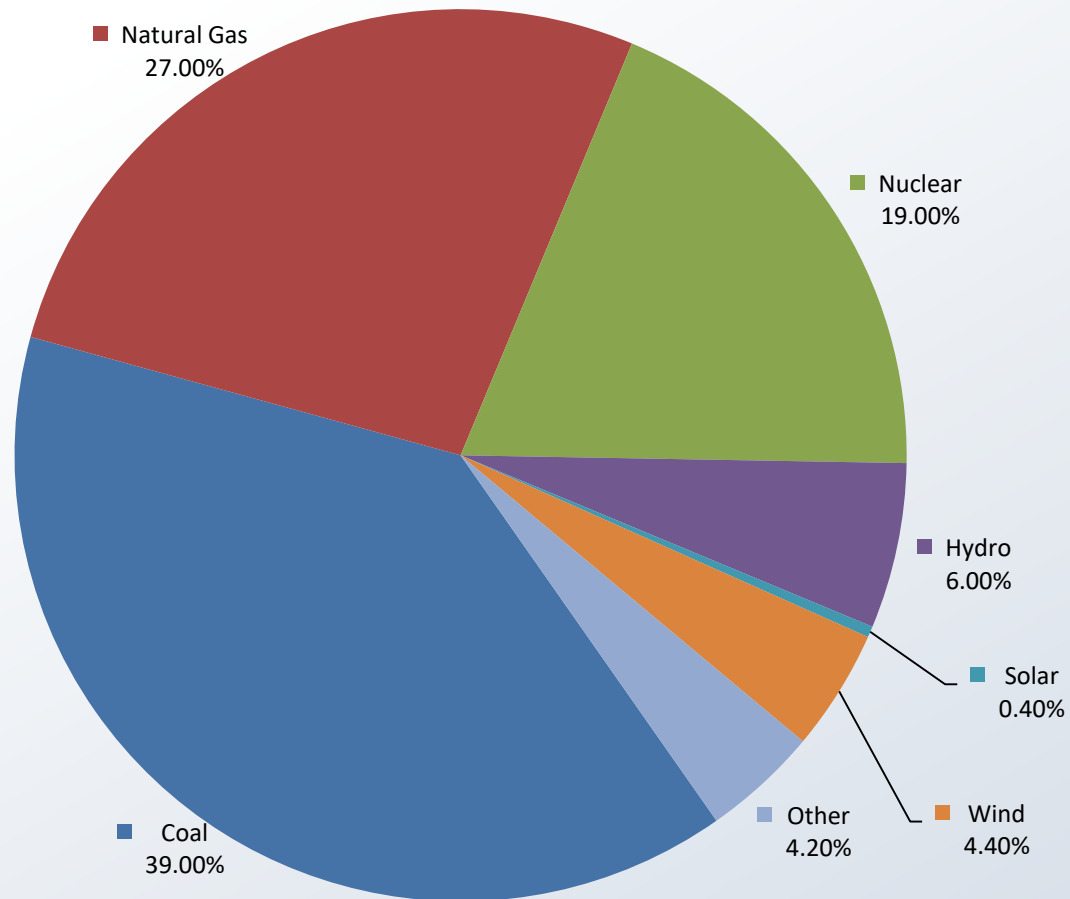




# United State Nuclear Plants



# United States Electricity Generation



Source: U.S. Energy Information Administration



# Nuclear Power Around the World

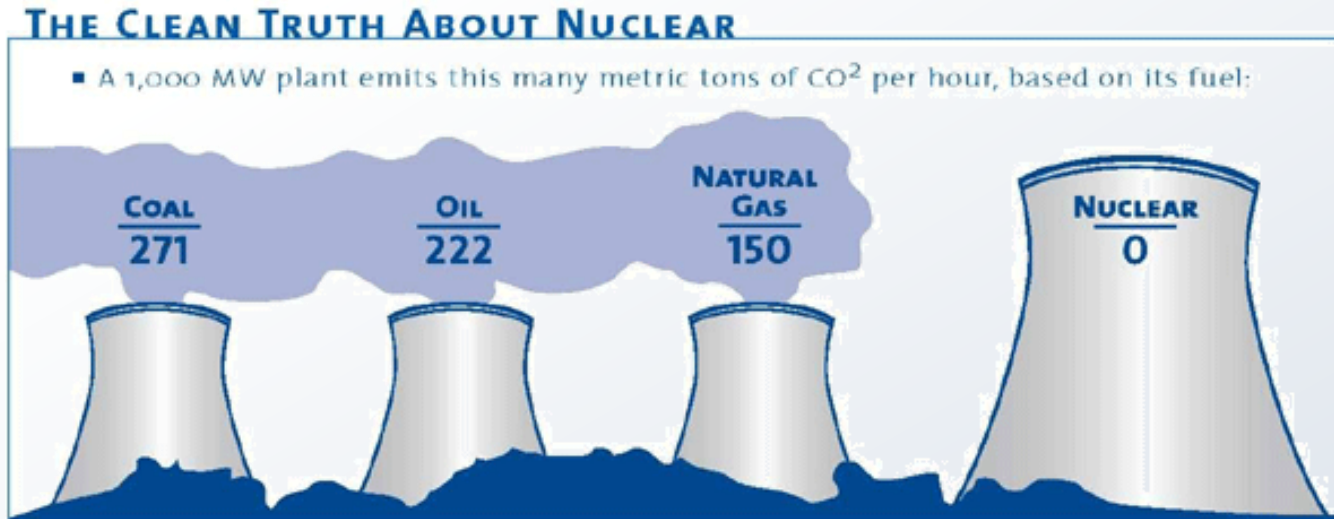


# Nuclear Power and The Environment

# What's coming out of those cooling towers?

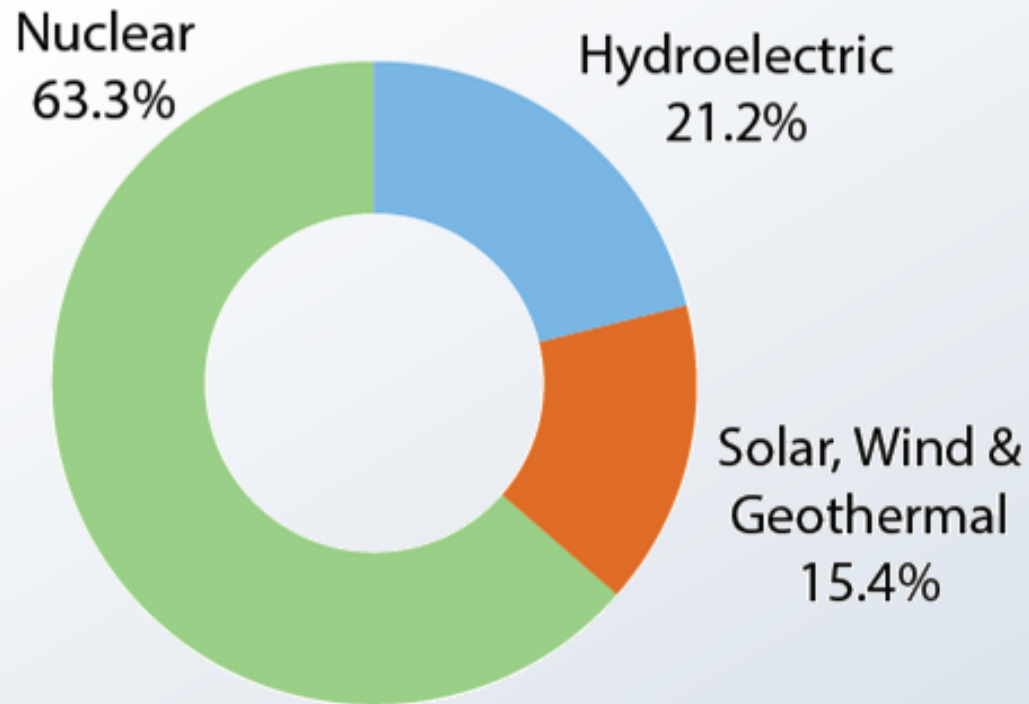


# Those aren't smoke stacks...



- Nuclear generated electricity avoided 613 million metric tons of carbon dioxide in 2011 in the U.S. This is nearly as much as is released from 118 million cars, which is nearly all U.S. passenger cars!
- Nuclear energy accounted for about 64% of the U.S. emission-free electricity generation in 2013.

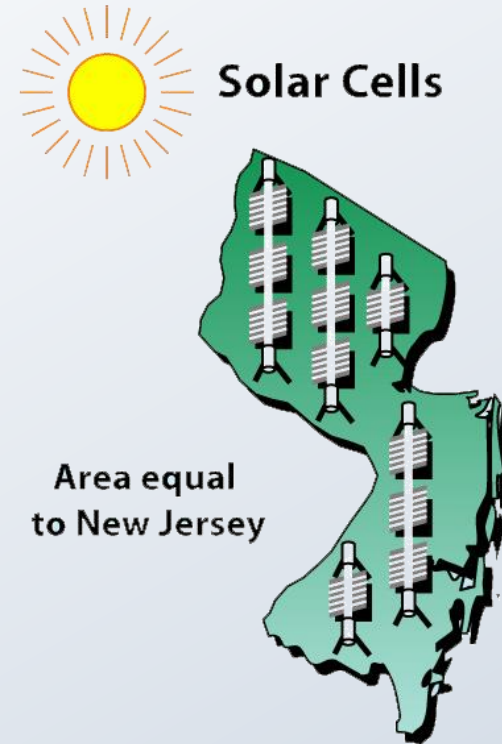
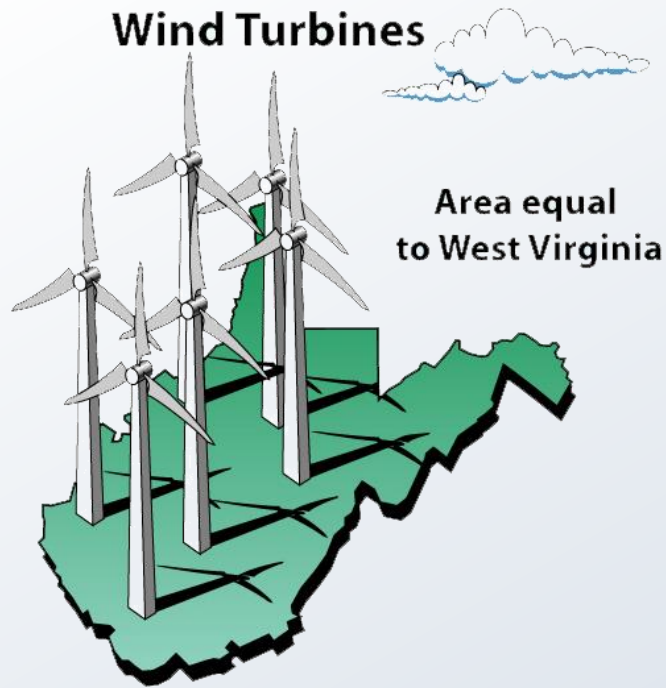
# Emission-Free Sources of Electricity - 2013



*Source: U.S. Energy  
Information Administration*

# Other Sources of Clean Energy

## Land Needed by Wind or Solar Energy to Match Annual Nuclear Energy Production\*





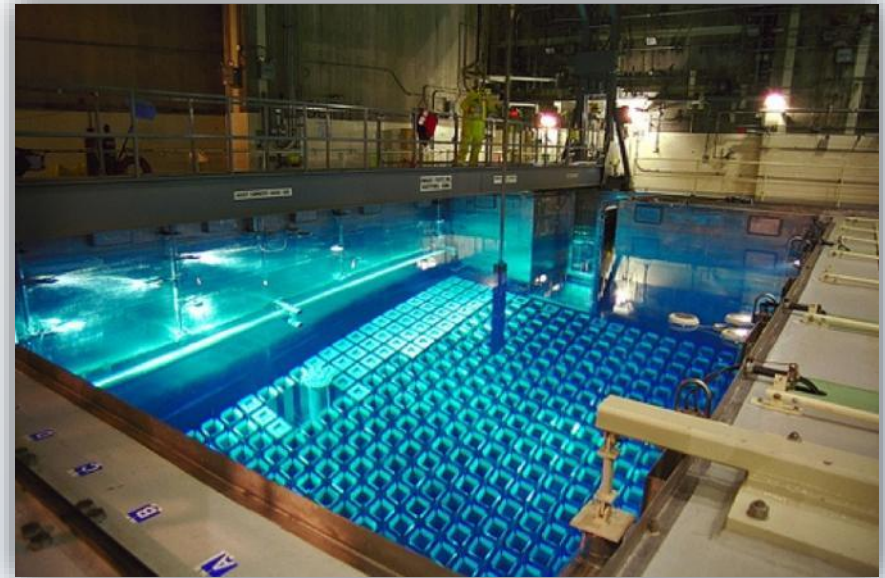
# Radioactive Waste

- **Spent Fuel Pool**

- Provide for the storage and cooling of the spent fuel, spent control rods, and other irradiated core internals
- Hold ~4000 fuel assemblies
- Designed to provide shielding to personnel, withstand seismic loadings, and prevent missiles, generated by high winds, from damaging the fuel

- **Dry Cask Storage**

- Fuel pool storage capacity will be exceeded
- viable near-term solution to free up storage space in the fuel pools



Nuclear Spent Fuel Pool

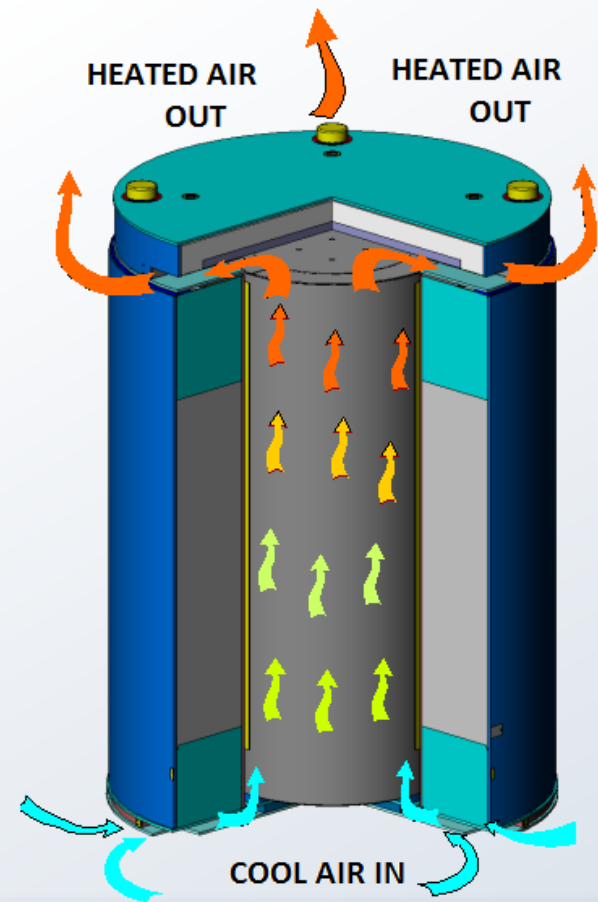
# Dry Cask Storage

# Dry Cask Fuel Storage

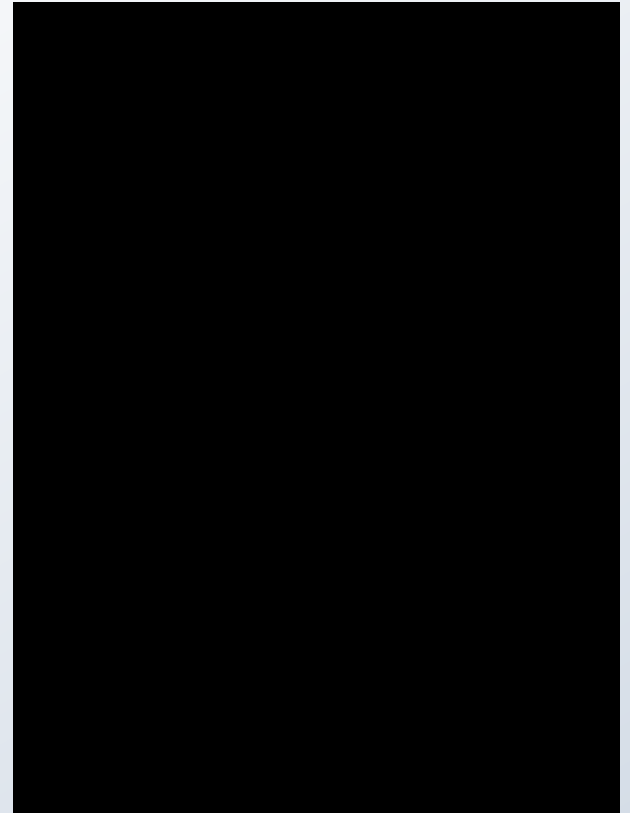
## ISFSI – Independent Spent Fuel Storage Installation

### Design Basis:

- **Tornado:** 260 mph
- **Tornado missiles:** up to 4,000 pounds at horizontal speed of 126 mph
- **Flooding:** submerged in 50 feet of water due to flood or tsunami
- **Site temperature:** -40F to +133F
- **Snow:** >100 pounds per cubic foot
- **Seismic:** 0.37 g
- **Fire**
- **Tip-over**



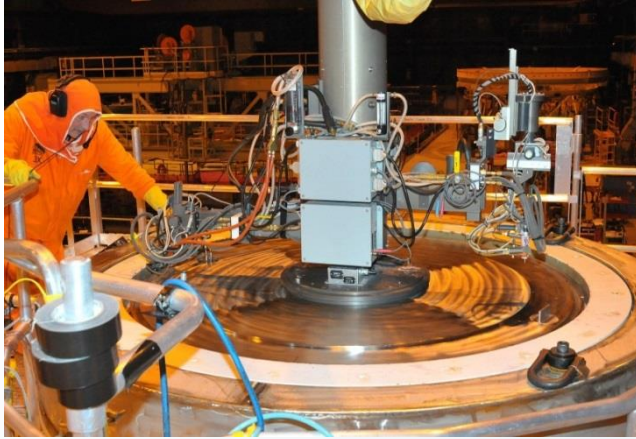
# Dry Cask Storage



# Dry Cask Storage



# Dry Cask Storage



# Nuclear Careers & Internship Opportunities

## Myth:

I have to be a nuclear engineer to work in the nuclear industry.





# Truth:

There is a wide variety of careers in nuclear power!

- Engineers
  - Nuclear, Electrical, Industrial, Chemical, Mechanical, Materials, Civil/Structural
- Professionals
  - Health Physicists, Radiation Protection Technicians, Chemists, Information Technology, Finance, Legal, Business Management, Security, and Training
- Skilled Workers
  - Electricians, Welders, Pipe Fitters, Machinists, Carpenters, Heavy Equipment Operators



# Exelon's Enterprise-Wide Intern Program

Program tracks include Engineering, Finance, IT, Retail, Corporate, and MBA.



Many of our interns complete multiple internships at Exelon and go on to receive offers for full-time positions with the company upon graduation.

The internship is a 10 week, paid program.

The 2018 program will run from June 4 - August 10.

# What to expect as an Exelon Intern

**Academic Learning:** Interns will work on value-add projects that will allow them to apply knowledge learned in the classroom to the workplace. At the end of the summer, they will present their projects to a panel of business leaders and their peers.

**Skill Development:** Exelon internships mirror full-time positions, and will allow interns to develop decision-making and critical thinking skills, increased confidence and self-esteem. Continuous feedback is integrated into the program, through initial Goal Setting, Mid-Term Evaluations, and End of Summer Evaluations.

**Career Development:** Opportunities to meet and interact with Exelon employees helps interns gain knowledge of the qualifications and duties of specific positions so students can explore their interest in the field.

**Peer Networking:** Organized intern program events provide an opportunity for interns to get to know each other in a more casual environment. Typical events include a plant/site tour, community service outing, and intern picnic.



# 2018 Summer Internships

## We are seeking students who meet the following criteria:

- Currently enrolled in Bachelor's or Master's program
- Minimum GPA: Cumulative 2.8/Major 3.0
- A track record of outstanding academic performance
- Eagerness to contribute in a team-oriented environment
- Ability to work creatively and analytically in a problem-solving environment
- Excellent leadership, communication (written and verbal) and interpersonal skills

## Engineering Majors Include:

- Mechanical Engineering
- Electrical Engineering
- Nuclear Engineering

## Non-Engineering Majors Include:

- |                        |                       |                |
|------------------------|-----------------------|----------------|
| • Business             | • Economics           | • Mathematics  |
| • Computer Engineering | • Finance/Accounting  | • Statistics   |
| • Computer Science     | • Information Systems | • Supply Chain |
| • Cyber Security       | • Marketing           |                |



# Questions

**Visit Exelon at ECS Career Fair  
September 12<sup>th</sup> – 12 – 6pm  
@ the ARC**

**[www.exeloncorp.com/careers](http://www.exeloncorp.com/careers)**

**Download our App – Exelon LINK**



Energize YOUR Potential

