

ANS Special Committee on Nuclear in the States



Presenting The Nuclear Narrative Technical and Regulatory Issues Facing Nuclear Power Plants Leveraging Global Experience

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Agenda



- I. Introduction/Background
- II. Clean Power Plan Implementation and Saving the Existing Fleet
- III. Premature Shutdown of Nuclear Plants/ The Value of Nuclear Energy and Actions in Response
- IV. Recent Press Release
- V. Revision of Clean Power Plan
- VI. Addressing the Flawed Electricity Market
- VII. Nuclear Power Plant as National Assets Legislation
- VIII. States with Moratoriums/Bans on Building New Nuclear
- IX. Virginia Nuclear Energy Consortium Authority and Impacts on Other States
- X. Next Actions/Goals
- XI. What can you do?

Introduction and Background



- Until 2013, the U.S. had 104 operating reactors
- In December of 2015, the US has 99 operating reactors and 1 in startup (Watts Bar 2) for a total of 100
- There are 4 AP1000s in construction in Georgia and South Carolina
- There are 5 sites in some level of active decommissioning: Zion, San Onofre 2/3, Crystal River 3, Kewaunee, and Vermont Yankee

Introduction and Background



- There are announcements of 3 more premature shutdowns based solely on economic conditions
- Pilgrim, FitzPatrick and Fort Calhoun and Clinton, Quad Cities at risk of potential premature shutdowns

Clean Power Plan Implementation and Saving the Existing Fleet



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- The Environmental Protection Agency (EPA) issued the final Clean Power Plan (CPP) in August, 2015
- The CPP requires each of the 48 contiguous states (Vermont and DC are exempted) to reduce the carbon emission levels by 32% from the 2005 levels by the year 2030
- The CPP provides very little guidance on how to implement this Plan

Clean Power Plan Implementation and Saving the Existing Fleet

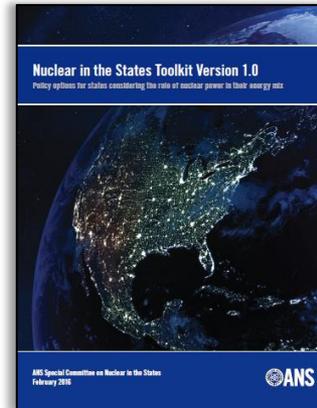


- I am co-chairing the *ANS Special Committee on Nuclear in the States*, which will engage our members in state-by-state efforts to maintain the current nuclear fleet and support nuclear new builds
- Intended to provide a consistent and standard approach for each of the states in valuing nuclear energy as an asset in their compliance with Section 111D of the Clean Power Plan or any other Clean Energy Standard

Clean Power Plan Implementation and Saving the Existing Fleet



- We formally rolled out Version 1 of “*Nuclear in the States Toolkit*” of state and federal tools and actions to be taken to appropriately value nuclear in meeting the requirements of the Clean Power Plan to the Press and Media on February 8, 2016
- We received very good feed back from the media
- Here is the *Politico* blurb from that morning:



WANNA KEEP NUCLEAR? YOU BETTER HAVE THE RIGHT GEAR: The American Nuclear Society hasn't necessarily cracked the code for saving the nation's nuclear power plants but they've collected a lot of recipes to do so. The group gave ME an unfettered sneak peek at the 40-page "toolkit" they're presenting today, which is aimed at extending lifelines to an economically shaken fleet of reactors - and you'd be hard-pressed to find a more comprehensive list. It's got everything you've thought of (power purchase agreements, clean energy standards), a few things you may have overlooked (selling a nuclear unit to another utility with a power plant nearby, like Exelon buying Fitzpatrick plant from Entergy), and some that advocates don't typically like to say in polite company (public ownership, utility re-regulation). Pete Lyons, DOE's former top nuclear energy official, Donald Hoffman of Excel Services, and nuclear economics consultant Edward Kee are presenting at 11 a.m. at ANS's D.C. office, 2000 M Street, NW. It'll be webcast too.

Clean Power Plan Implementation and Saving the Existing Fleet



- Update from the *Politico* afternoon energy report:

SAVING NUCLEAR FOR NUCLEAR'S SAKE: The American Nuclear Society's first policy "toolkit" today is designed to help position the group as honest broker for those aiming to meet carbon goals and preserve a future for nuclear power in the U.S. at the same time. The group's 40-page report is a menu of options rather than a plan of action for helping market-challenged power reactors.

"We care a lot about the nuclear power industry in this country and we see this threat from markets as an existential threat," said Edward Kee, a nuclear economics consultant and co-chair of the effort. Kee warned that giving up on the existing fleet of nuclear power plants might mean ceding the industry's center of gravity to China. "In the end we could be buying nuclear power plants from China in the 2030 to 2050 range to meet our goals for carbon," he said. The group's leaders, including former DOE nuclear energy official Pete Lyons and Donald Hoffman of Excel Services, plan to press nuclear's case to any governor, regulator and state legislature willing to grant them an audience.

Clean Power Plan Implementation and Saving the Existing Fleet

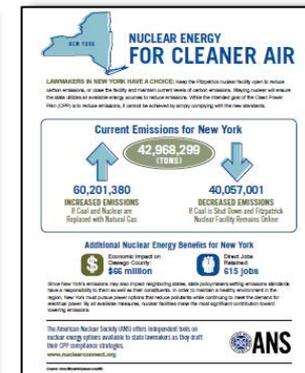
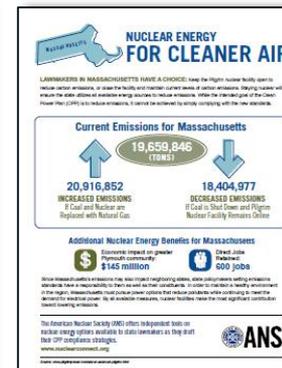
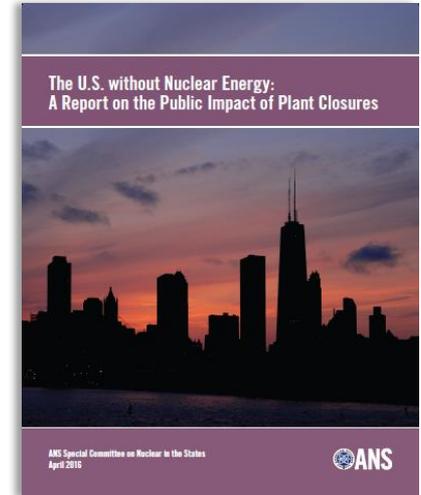


- We will tailor this Toolkit for each State administration to appropriately consider and value nuclear in the decision related to the energy, economy and environment in that State
- We presented to the National Governors Association (NGA), the National Association of State Energy Officials (NASEO), and the National Association of Regulatory Utility Commissioners (NARUC), in Washington, D.C. in February 2016
- I will personally be visiting each Governor and his/her staff to discuss the State specific changes to make to the toolkit to assist in implementing the CPP or a Clean Energy Standard (CES)

Clean Power Plan Implementation and Saving the Existing Fleet



- We rolled out an “*Impact of No Nuclear*” Report that outlines the impacts of no nuclear energy by states, regions and the nation on April 19, 2016 at ICAAP that informs state and federal policy makers of the impacts of various actions related to nuclear power plants
- We created infographics for the states of CA, MASS and NY that inform policy makers of the benefits of nuclear energy in their respective states



Clean Power Plan Implementation and Saving the Existing Fleet



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- We will rollout a *“Case Studies on the Effects of Nuclear Plant Closures and Models of Emissions and Power Generation”* along with *“Methods of Compliance with the Clean Power Plan”*, at the June 2016 ANS Annual meeting in New Orleans
- We will be presenting a Consolidated Report and a Plan Forward to the ANS Board of Directors at the June 2016 ANS Annual meeting in New Orleans

Clean Power Plan Implementation and Saving the Existing Fleet



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- I have met with the Governors and their staffs of Virginia, Maryland, New Jersey, and South Carolina
- We met with the staff of the Governor of New York in April, 2016 and responded on May 4, 2016 to the New York Clean Energy Standard
- We have continued discussions related to FitzPatrick and Indian Point with the Governor and Staff of New York
- Our focus is now on California, Ohio, Illinois and Massachusetts
- We are coordinating with the Nuclear Energy Institute, Third Way, Nuclear Matters and The Breakthrough Institute and others

Clean Power Plan Implementation and Saving the Existing Fleet



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- We will be meeting with the EPA and Congressional leaders on this and other topics in the late summer 2016
- We will be meeting as many Governors and their staffs as possible throughout 2016
- We will be meeting with federal and state policy organizations that affect energy throughout 2016
- We are making presentations in the United States and globally about these efforts

Premature Shutdown of Nuclear Plants and Actions in Response



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- Two plants have already prematurely shutdown based solely on economic conditions: Kewanee and Vermont Yankee
- Entergy has announced two more premature site shutdowns based solely on economic conditions: Pilgrim and Fitzpatrick.
- They are citing poor market conditions, reduced revenues, and increased operational costs → annual loss of \$40 million in revenue for Pilgrim

Premature Shutdown of Nuclear Plants and Actions in Response



- The management of Omaha Public Power District (OPPD) has recommended Fort Calhoun be prematurely shutdown by December, 2016, quoting, *“Rising costs, record low natural gas prices, and flat or declining demand for electricity have made it impossible to run the reactor in the black.”*
- OPPD CEO stated the utility position is financially untenable

Premature Shutdown of Nuclear Plants and Actions in Response



- U.S. Electricity Market is severely flawed.
- U.S. Electricity Market favors subsidized wind and solar
- U.S. Electricity Market recognizes no unique value for Nuclear
- Not all KW are created equal:

The unique value of nuclear is :

Energy, Economy, and Environment

- Nuclear produces affordable, available, reliable energy 7 days per week/24 hours per day as the only environmentally friendly baseload energy supply
 - **Supports grid stability**
 - **Provides price stability**
 - **Runs when needed**
 - **Contributes to fuel and technology diversity**

Economy



- Each year, the average nuclear facility generates approximately \$490 million (U.S.) in sales of goods and services
- The same average nuclear facility will create nearly \$46 million (U.S.) in total labor income
- Operation of the same average nuclear facility generates 700-1200 permanent jobs, which pay 36 to 42% more than average salaries in the local area and the state

Economy



- Permanent jobs at nuclear plants create equivalent numbers of support jobs locally- grocery stores, restaurants, dry cleaners, car dealers
- Every dollar spent by the average nuclear plant produces \$1.04 in the local community- anchors the local community
- Each nuclear plant generates an average of \$16 -\$20 million (U.S.) in state and local tax revenue for schools, roads and similar infrastructure
- And the federal tax payments of each nuclear unit is roughly \$67 million (U.S.)
- The cost of waste is included in nuclear and not in other energy sources

Nuclear produces approximately 20% of the U.S. energy but provides over 63% of the carbon-free emitting energy in the U.S.

- **Provides clean air compliance value**
- **Avoids carbon emissions**

Actions



- We have reached out to the leadership of Entergy and Exelon, and to the Governor of NY to attempt to broker some agreement to keep FitzPatrick operating
- We met with the staff of the Governor of NY on April 12, 2016 to discuss FitzPatrick
- We also begun discussions with the state of NY to keep Indian Point operating
- Have also begun developing justification to keep Pilgrim operating- have some time.
Currently, Pilgrim will be refueled in 2017 and shutdown in 2019

Actions



- Developing generic information to inform State and Federal Government officials about the value of nuclear
- We spoke with the Senior Policy Advisor on Energy, Climate, and the Environment of the State of California on the phone on April 22, 2016, to discuss the situation in California related to the need for the approval of Permits and License Renewal for Diablo Canyon
- Meeting with Governor and Lt. Governor of California now scheduled for early June, 2016

Actions



- There is an urgent need to develop policies that will prevent additional, premature nuclear plant retirements, because the economic and environmental consequences are incredibly detrimental.”
- At a nuclear energy summit held May 19, 2016 at the Department of Energy. NEI CEO Marvin Fertel said that 15-20 nuclear power plants are at risk over the next five to 10 years. He blamed low power prices brought on by auctions in deregulated markets, competition from natural gas, and government subsidies for solar and wind energy plants at the federal and state levels

Actions



- Fertel also said that two more reactors, Exelon's Quad Cities nuclear plant in Illinois, were at immediate risk of shutting down in the next few years if the legislature doesn't address the issue.
- He added that change is needed at the Federal Energy Regulatory Commission, which has long favored renewable energy sources over nuclear.

Actions



- Meeting with Donald Trump as a member of the Trump Leadership Council (TLC)- “stand alone organization whose purpose is to provide candidate Trump with the best ideas from America’s brightest business and civic leaders” on June 9, 2016
- 10 Sectors- one is Energy
 - I am advising on energy related to all energy sources*
- Intent is to convince Trump of need for sensible Energy Policy for energy solutions for decades to come
- Will meet with Democratic Presidential candidate as well as this is a bipartisan issue

Actions



- Setting meeting with CEO of OPPD and Governor of Nebraska before June 16th to discuss benefits of keeping Fort Calhoun operating

Simple ask:

What is more appropriate/beneficial?

- Negotiate mechanisms to make Fort Calhoun profitable in generating electricity so as to retain the unique values of energy, economy and environment of nuclear, **OR**
- Obtain additional \$750 million for decommissioning Fort Calhoun

'We're not asking for special treatment' -- advocate

[Kristi E. Swartz](#), E&E reporter

Published: Monday, April 18, 2016

ATLANTA -- Policymakers aren't doing enough to value nuclear energy in the United States, and that's unacceptable, one industry veteran said.

Donald Hoffman, chief executive officer of Excel Services Corp., has an approach to what he says will put nuclear on a level playing field and stop shutting down reactors. Hoffman, past president of the American Nuclear Society, said he will talk with U.S. EPA later this year about valuing nuclear in the Clean Power Plan.

He also wants a bill in Congress that would give bridge financing to merchant nuclear plants that cannot compete economically because natural gas prices and, in some cases, renewables are so low.

Recent Press Release



"We're not asking for special treatment, but if you're going to provide subsidies for all clean energy sources, provide for all of them," Hoffman said at a Nuclear Energy Insider conference here last week.

ANS is a nonprofit professional group that promotes nuclear science and technology. Hoffman co-chairs a special committee that looked at each state's greenhouse gas reduction targets for the Clean Power Plan and came up with options on how nuclear will fit in.

ANS filed comments on the draft rule, but Hoffman said he wants to meet with EPA later this summer. The intent is to have the agency make additional rewrites.

It's unclear whether he will be successful. EPA in the final rule did boost states building nuclear reactors after the draft rule did not. Georgia, South Carolina and Tennessee successfully pushed the agency to change the treatment of five reactors being built in those states, allowing them to count future electricity production toward their carbon-reduction goals.

Recent Press Release



Georgia's largest group of municipalities and electric cooperatives also urged EPA to expand a voluntary portion of its Clean Power Program to include nuclear power.

ANS's concerns lie with reactors that are already operating but are in danger of being shut down because of economics. Those reactors could operate for decades longer because of license renewals, he said.

"We need [EPA] to recognize that nuclear is going to be around much longer, assuming we can stem the tide of premature shutdowns for economic reasons and find a way to acknowledge it," Hoffman said in an interview.

Blueprint for Congress

The Clean Power Plan is tied up in courts, however. What's more, it will take years to implement if it goes forward.

This is where Congress can step in, Hoffman argues. With the help of others, he has crafted a draft bill modeled after old legislation from now-retired Sen. George Voinovich (R-Ohio), once one of the Senate's strongest supporters of nuclear energy.

The bill would call for a funding mechanism -- Hoffman said he was purposely not calling it a subsidy because the word has become so polarizing in the energy industry -- to help keep financially troubled reactors operating.

Recent Press Release



Financial difficulties at the James A. FitzPatrick nuclear power plant in New York and the Pilgrim Nuclear Generating Station in Massachusetts have driven his efforts. Operators of both plants are shutting them down.

"It doesn't matter how safe we are at operating these facilities; if we can't make any kind of a profit, they can't stay in business," he said. "These are private entities and organizations, somewhat subsidized in that they have stakeholders or stockholders, but in reality, they are trying to make a profit."

It is not appropriate that operators are prematurely shutting down reactors because they cannot compete economically, Hoffman said. He points fingers at artificially low gas prices, deregulated markets and other contributing factors.

"There is a return on investment for the public and for the federal government on giving some kind of financial bridge to that time frame," he said.

Long, slow road ahead

Hoffman is aware of the criticisms for federal loan guarantees given to Georgia Power Co.'s Plant Vogtle expansion project. Such financial cushions aren't the reason why that and Scana Corp.'s V.C. Summer reactors are being built, he argues.

"The electricity markets are fair, the regulators are engaged, and they are in appropriately regulated markets," Hoffman said.

ANS earlier this year released a tool kit that looks at options meant to help ensure existing nuclear plants remain in operation and spur the construction of new ones ([E&ENews PM](#), Feb. 8). The group also is in the slow process of meeting with governors and policymakers in each state.

Recent Press Release



The group is pushing nuclear as the only source of emissions-free baseload electricity and one that comes with a host of economic benefits. Governors who are running for re-election are key because they will tout a pro-business, pro-job platform, complete with low electricity prices, and nuclear plants are a perfect example of that, Hoffman said.

"We have to start influencing our state and federal policymakers now," he said. "I'm talking about getting in a room and not allowing them to leave until we have an action plan that says who and what and when."

Revision of Clean Power Plan (CPP)



- The Clean Power Plan (CPP) as written did not accomplish the goals for which it was intended
- The CPP, as written, would permit a state to increase carbon emissions and still be in compliance (malicious compliance)
- The CPP did not adequately value nuclear
- We will markup the CPP to assure it meets the intended goals and meet with the EPA in early fall 2016

Addressing the Flawed Electricity Market



- The U.S. Electricity Market is severely flawed and cannot fulfil its key functions
- Symptoms include:
 - Falling wholesale prices at a time of rising generation costs
 - Early plant closures
 - Financial problems for utilities, which are nonetheless expected to engage in the biggest investment program in history to meet carbon targets

Addressing the Flawed Electricity Market



- The frequent occurrence of zero or negative prices
- Debates over the need for market reforms, in particular the introduction of capacity mechanisms to underpin investment in the plants needed to maintain supply security
- Complaints from consumers about constantly rising prices, etc.

Addressing the Flawed Electricity Market



- Unless the U.S. electricity markets recognize the carbon-free attributes of nuclear plants, there will continue to be a substantial number of nuclear plant closures in the U.S.
- Despite performing at exceptional efficiency, many U.S. nuclear facilities do not receive fair consideration for producing both clean and reliable electricity. As a result, the nuclear fleet is at risk of early retirement, jeopardizing the country's ability to reduce carbon emissions, as well as increasing the likelihood of greater price volatility and power outages

Addressing the Flawed Electricity Market



- U.S. carbon-reduction goals depend significantly on the continued use of nuclear power. The carbon-free electricity loss due to the closure of the San Onofre nuclear power plant in California alone was greater than the combined total of all the electricity from California's wind and solar generation.
- Over the last three years, several other U.S. nuclear units have also shut down. Although a few of those shutdowns were due to technical reasons, the decisions to close them were still the result of not being able to justify the capital cost needed, given the current economic conditions. Further closures are being considered, some of which may be announced in the very near future.

Addressing the Flawed Electricity Market



This situation has been well understood by Wall Street for some time. For example, in July 2015, Fitch Ratings commented:

"Absent reforms to address constraints in the current market structure, Fitch Ratings considers at least eight additional merchant nuclear units with an aggregate capacity of approximately 8000 MWe to be at risk of early retirement."

Addressing the Flawed Electricity Market



- One of the main reasons why nuclear power is struggling to compete in the market is the negative impact of subsidies for wind and solar. These subsidies encourage wind generators to maximize production even when electricity demand is low, such as at night, as they get paid regardless of whether or not there is the need for their electricity. As they sell power irrespective of the demand, this drives down wholesale prices resulting in negative pricing, where other generators such as nuclear must pay grid operators to take the power they produce. This simply is not a sustainable financial model.

Addressing the Flawed Electricity Market



- Negative pricing has become more pronounced as more wind has joined the grid. There are several other market forces that also affect nuclear plants in deregulated markets or competitive markets. These include: low or no growth in electricity demand in some areas; low natural gas prices continuing to depress wholesale prices; transmission constraints resulting in charges to move power onto the grid; and there are also significant market design issues. Aside from its carbon-free attributes, the markets continue to fail to fully recognize the value of reliable baseload power provided by nuclear plants.

Addressing the Flawed Electricity Market



- Such flaws in energy and capacity market rules must be corrected in order to ensure that baseload clean energy is properly valued and remains in service
- We are developing a plan to meet with FERC and other Federal, Regional and State organizations to determine the best course of action to change these significant electricity market flaws in 2016

Addressing the Flawed Electricity Market



- We are developing solutions to be implemented in the near term and long term to provide a level playing field for all energy assets and to recognize the strengths and weaknesses of each and determine the relative percentages of each that should make up our energy portfolios short term and long term
- Talking to the Democratic and Republican candidates for U.S. President

Addressing the Flawed Electricity Market



- We are recommending an Energy Policy that will shape our approach to energy solutions for decades to come
- Sensible policy which considers all energy sources

Informed on a routine basis providing for reliable, available, affordable, and environmentally friendly energy

National Assets Legislation



- I have proposed legislation that would have the Federal Government/ Congress formally acknowledge our Nuclear power plants as “National Assets”
- **1960’s**
Years of design, licensing and construction to place into operation at cost of hundreds of millions of dollars
- **Now**
More years of design, licensing and construction to place into operation at costs of billions of dollars

National Assets Legislation



- Provide a funding mechanism until such time as the plant could economically compete in the region in which it is operating
- Currently in informal Senate/House Review for inclusion in a future Congressional action
- 32 Senators/ Congressmen and Congresswomen currently strongly support- continuing to get more support every week
- Hope for resolution in late 2016/early 2017

States with Moratoriums/Bans on Building New Nuclear



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- Working with the states that have a Moratorium on building new nuclear
- Supported Governor Walker with recent decision in Wisconsin
- Currently working behind the scenes with Governor Bevin and staff of Kentucky
- We are in talks with the Governor of Oregon and others
- Plan to address other states and provide templates used for Wisconsin to assist these states with lifting bans/moratoriums

States with Moratoriums/Bans on Building New Nuclear



- States with a Ban
Hawaii/Minnesota
- States with a Restriction
3 types: 3a Waste Limit
3b Cost limit
3c Ratification

3a Waste Limit

California

Connecticut

Illinois

Kentucky

Maine

Massachusetts

New Jersey

Oregon

West Virginia

Wisconsin

States with Moratoriums/Bans on Building New Nuclear



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3b Cost Limit

Connecticut	Minnesota	North Carolina
Illinois	Missouri	Pennsylvania
Indiana	Montana	Rhode Island
Iowa	New Jersey	West Virginia
Kansas	New York	Wisconsin

3c Ratifications

California	Maine	Oregon
Hawaii	Massachusetts	Pennsylvania
Illinois	Montana	Rhode Island
		Vermont

Virginia Nuclear Energy Consortium Authority (VNECA)



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- I currently chair the Virginia Nuclear Energy Consortium Authority (VNECA)
- VNECA is charged with the responsibility for making the Commonwealth a national and global leader in nuclear energy and to serve as an interdisciplinary study, research, and information resource for the Commonwealth on nuclear issues
- VNECA reports directly to the Governor of Virginia. I am working with other state's governors to establish a similar type of entity to ensure that nuclear is valued as it should be

Next Actions



1. Continue to develop product/ tools that the state and federal staff can use to appropriately value nuclear in the energy decisions
2. Continue to develop the technical information that creates informed energy policy
3. Continue to meet with Governors and their staff about energy policy and the value of nuclear in the state, region and nation

Next Actions



4. Continue to meet with policy makers and utilities to broker agreements so nuclear plants do not shutdown prematurely
5. Continue to work with Governors and state legislatures to lift all new nuclear build moratoriums and bans
6. Continue to work with the states, region and federal to revise the flawed electricity policies

Next Actions



7. Plan is to halt premature shutdowns, lift bans/moratoriums, revise CPP and revise flawed electricity markets and
8. Provide a level playing field for nuclear so that it can play the role for which it is qualified, intended and needed for US energy needs

What Can You Do?



- Continue to operate our nuclear facilities at the highest levels of safety
- Assist in refining and delivering the message and the ask
- Write, call, reach out to your state and federal policy makers
- Identify opportunities for us to interact with state and federal policy makers related to your state and your nuclear facility



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QUESTIONS/ DISCUSSION



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Thank You!

Contact Information



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