

The Way Forward on Advanced Reactors: Industry Progress, Initiatives and Concerns

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**NRC-DOE Workshop on Advanced Reactors
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Overview

- NIC commends the staff of the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) for organizing this meeting
- We appreciate the continuing opportunity to share our views on these important issues
- NIC serves as a leading advocate for Advanced Reactor technologies
- NIC's comments today will focus on:
 - The State of the Industry
 - ✧ Progress
 - ✧ Challenges
 - Advanced Reactors Developers Survey on DOE Initiatives
 - The Road Ahead

State of the Industry - Progress

Bipartisan Support for NRC Reform & Modernization

- Advanced Nuclear Technology Development Act of 2017 (H.R.590)
 - Passed House without amendment (01/23/2017)
 - Referred to the Senate Committee on Environment and Public Works (02/10/2017)
- Nuclear Energy Innovation and Modernization Act (S. 512)
 - Marked up in Senate Committee on Environment and Public Works (03/22/2017)

Bipartisan Support for Nuclear Energy Innovation & Capabilities

- Department of Energy Research and Innovation Act (H.R.589)
 - Passed House (01/24/2017)
 - Referred to Senate Committee on Energy and Natural Resources (01/30/2017)
- Nuclear Energy Innovation Capabilities Act of 2017 (S.97)
 - Senate Committee on Energy and Natural Resources - Ordered to be reported without amendment favorably (03/30/2017)

State of the Industry - Progress

Secretary Perry G-7 Statement – April 10, 2017

“.... We believe it is wise for countries to use and pursue highly efficient energy resources.

They include... Advanced civil-nuclear technologies that are proliferation resistant, produce little to no waste and ensure safety.

Innovation is also a top priority for the Trump Administration. We are committed to developing, deploying and commercializing breakthrough technologies...”

State of the Industry – More Progress

- NuScale Power Small Modular Reactor (SMR) License Submittal – December 31, 2016
- First Movers
 - TVA Clinch River Early Site Permit
 - DOE Idaho Land Withdrawal
- Pro-active NRC engagement with Advanced Reactors Stakeholders
- GAIN Round II
- Fuel Working Groups traction
- 4th Annual Advanced Reactors Technical Summit IV – Argonne February 2017
- At Least one developer has indicated they will submit an application as early as 2019
- At least 20 developers pursuing an advanced reactor design largely funded by more than \$1 billion in private investment

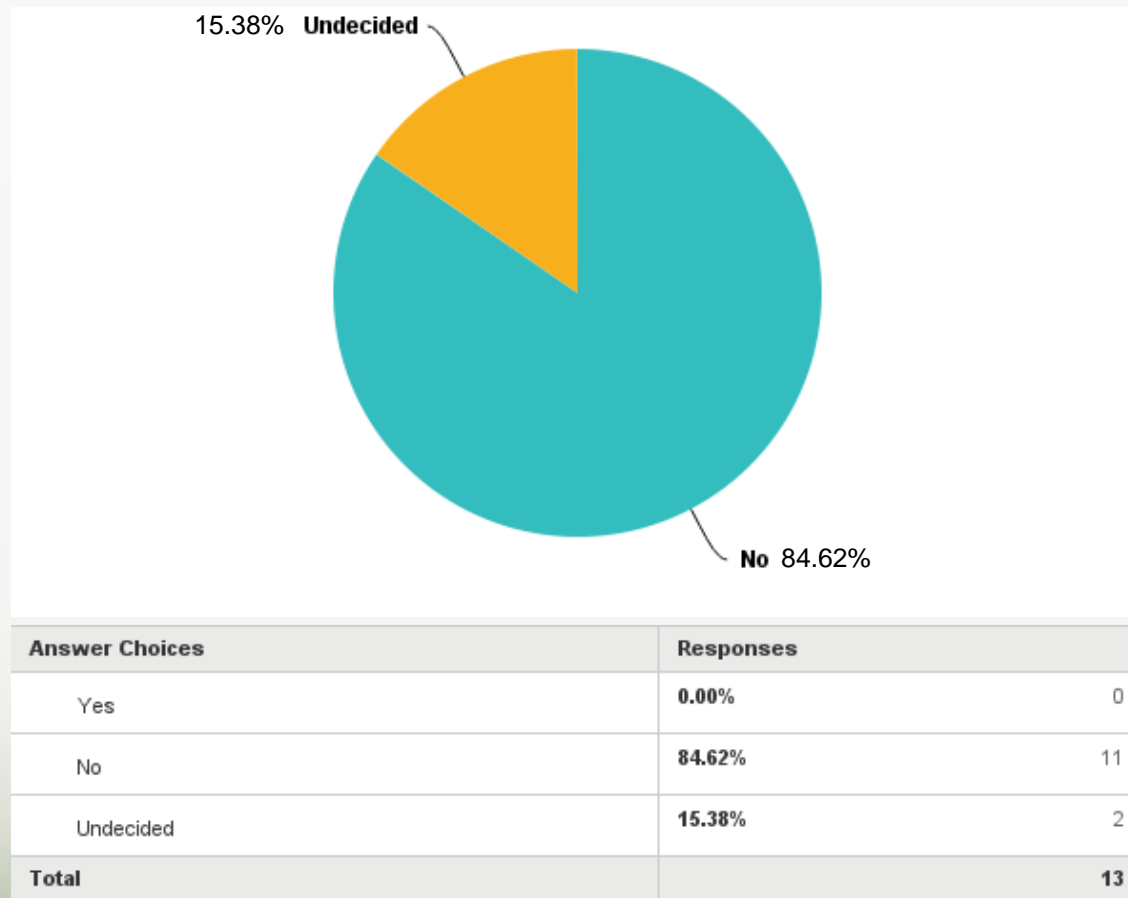
State of the Industry - Challenges

- FY2017 Uncertainty
 - Including \$5 million off-budget for NRC Advanced Reactor infrastructure
- FY2018 Budgetary Headwinds
- Westinghouse Chapter 11 Fog
- NRC Commission vacancies
- Companies going off-shore for initial licensing
- Companies going off-shore for testing/Lack of a new Advanced Test Reactor
- High Assay LEU conundrum
- International competitors moving forward funded by a Sovereign paradigm

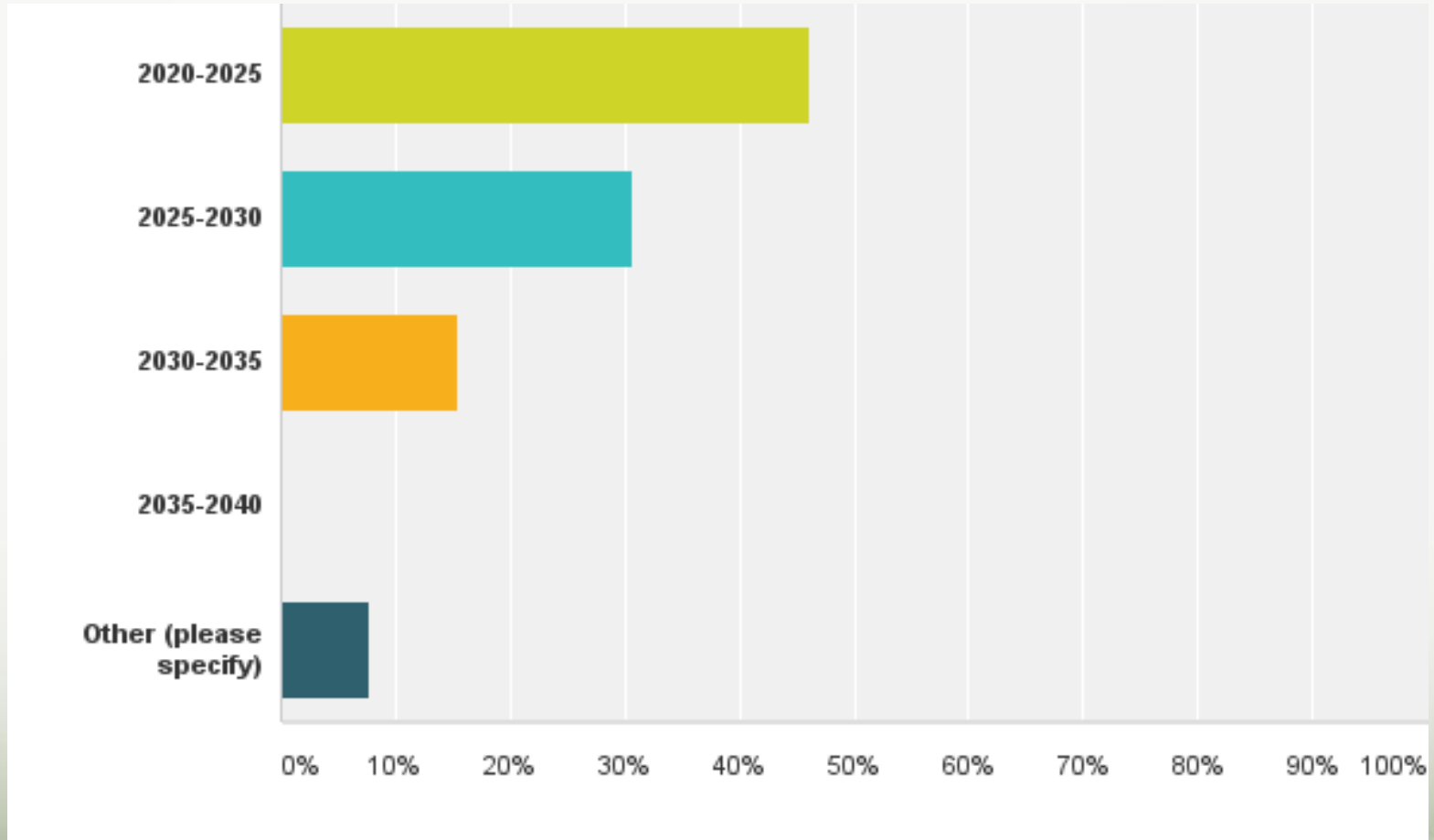
USNIC Technology Owners Group (TOG) Survey on DOE Initiatives

- USNIC conducted a survey of 18 leading U.S. Advanced Reactor technology developers with regard to DOE Initiatives
- 2nd in a series – TOG NRC Policy Issues survey presented in March 2017
- 18 Developers, one respondent per company
- This was a blind survey so individual results were not identified
- 73% of the developers surveyed provided input

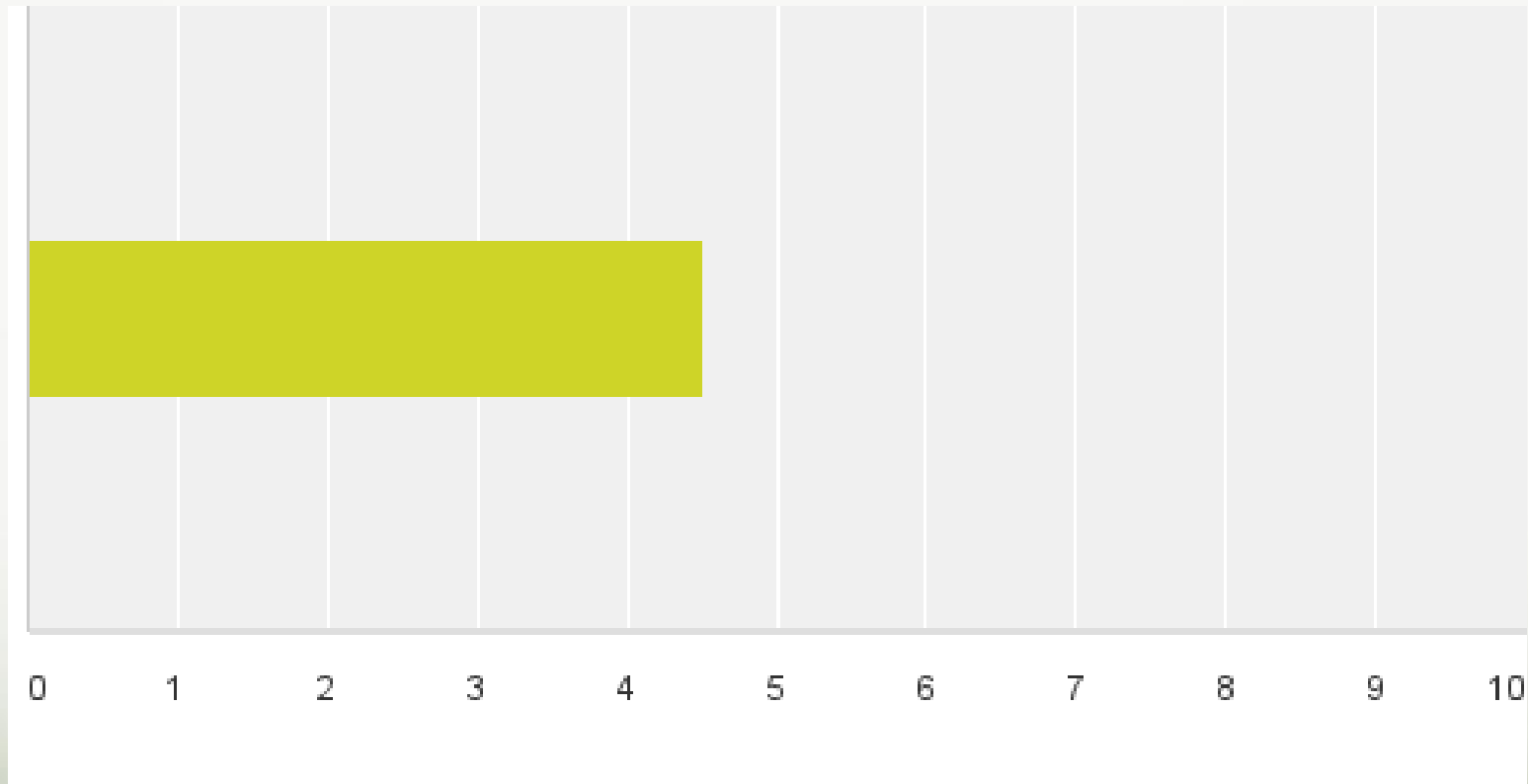
Q1: Is DOE providing adequate funding and other support for US advanced development?



Q2: What should the DOE's and NRC's planning timeframe for deployment of an advanced reactor in the US be?



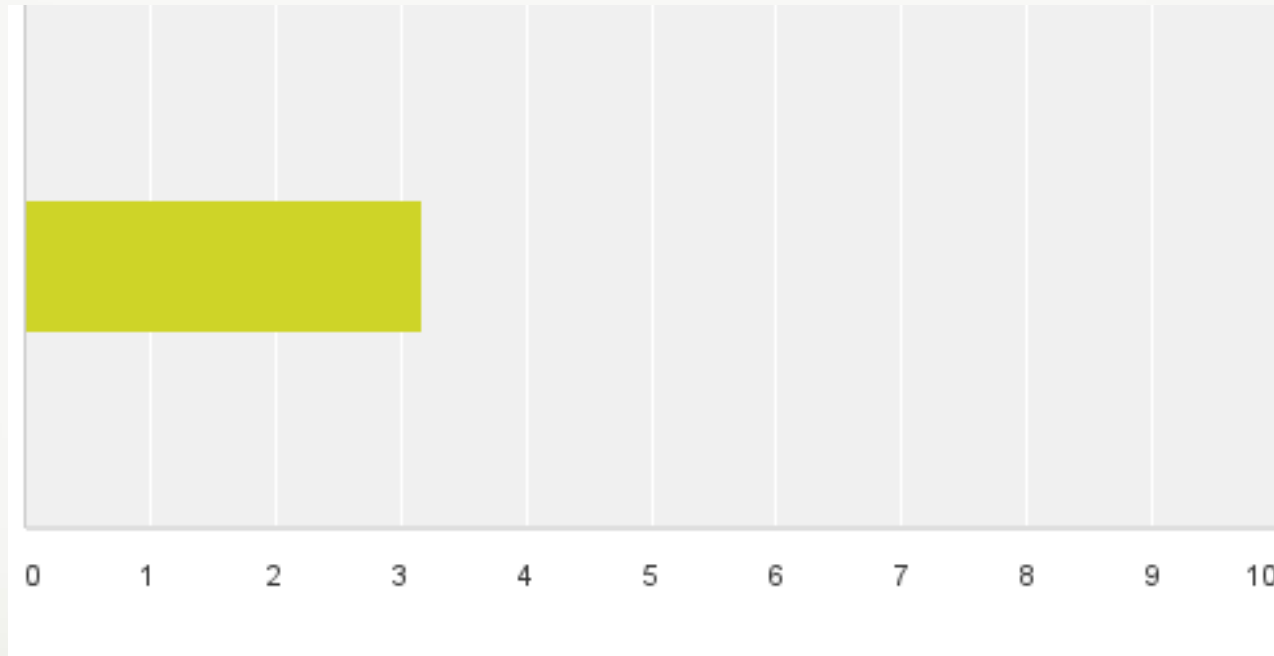
Q3: How would you assess DOE's level of support for US advanced reactors development (on a 1 to 10 scale)?



Q4: Rank the following in terms of priority

| | Urgent | Important | Somewhat important | Low priority | Don't know | Total | Weighted Average |
|---|--------------------|--------------------|--------------------|--------------------|-------------------|-------|------------------|
| Grants to pay for NRC pre-licensing activities? | 53.85% 7 | 15.38% 2 | 15.38% 2 | 15.38% 2 | 0.00% 0 | 13 | 3.08 |
| Assured supply of High Assay LEU? | 50.00% 6 | 16.67% 2 | 16.67% 2 | 16.67% 2 | 0.00% 0 | 12 | 3.00 |
| More funding for the Advanced Reactors Concept cost-share Program for technology development? | 46.15% 6 | 7.69% 1 | 30.77% 4 | 15.38% 2 | 0.00% 0 | 13 | 2.85 |
| New Advanced Test Reactor? | 30.77% 4 | 38.46% 5 | 7.69% 1 | 23.08% 3 | 0.00% 0 | 13 | 2.77 |
| Access to DOE National Labs? | 15.38% 2 | 46.15% 6 | 30.77% 4 | 7.69% 1 | 0.00% 0 | 13 | 2.69 |
| Development of government first mover sites for prototypes, demos? | 30.77% 4 | 30.77% 4 | 15.38% 2 | 23.08% 3 | 0.00% 0 | 13 | 2.69 |
| GAIN program? | 23.08% 3 | 30.77% 4 | 30.77% 4 | 15.38% 2 | 0.00% 0 | 13 | 2.62 |

Q5: How would you assess the GAIN's current \$2 million level of support for US advanced reactors development (on 1 to 10 scale)

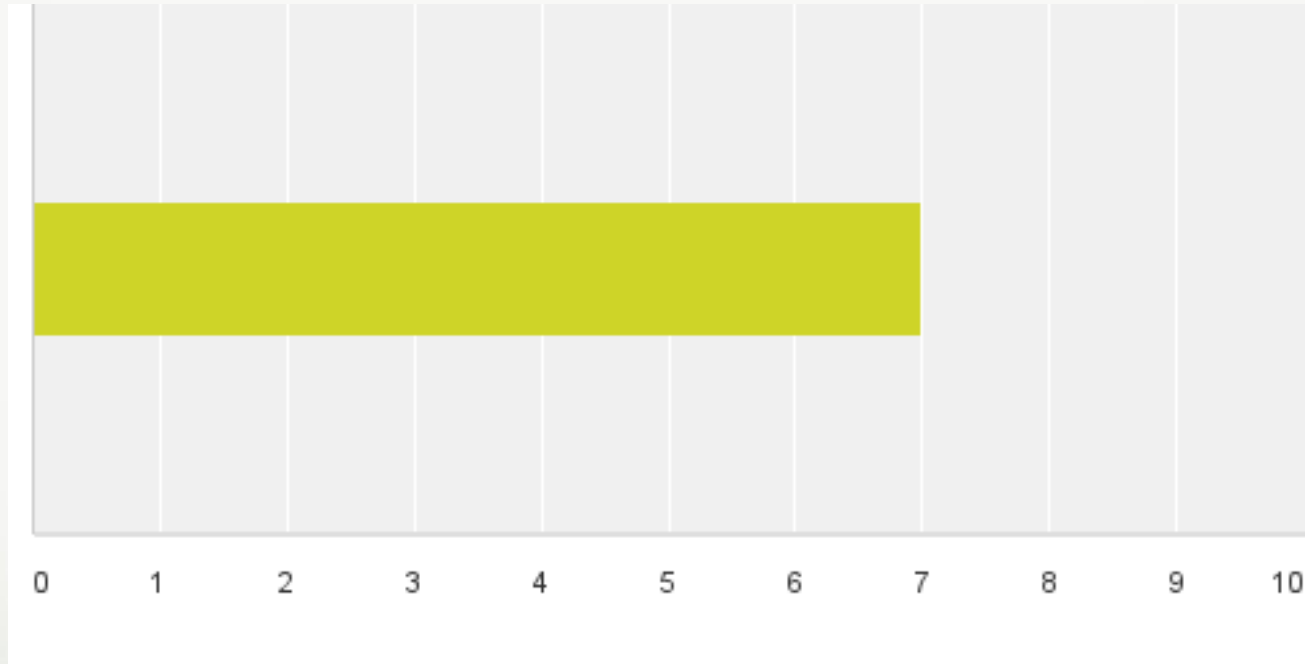


| Answer Choices | Average Number | Total Number | Responses |
|------------------------------|----------------|--------------|-----------|
| | 3 | 38 | 12 |
| Total Respondents: 12 | | | |

Q6: Which issues do you believe are most important regarding access to High Assay LEU (HLEU)?

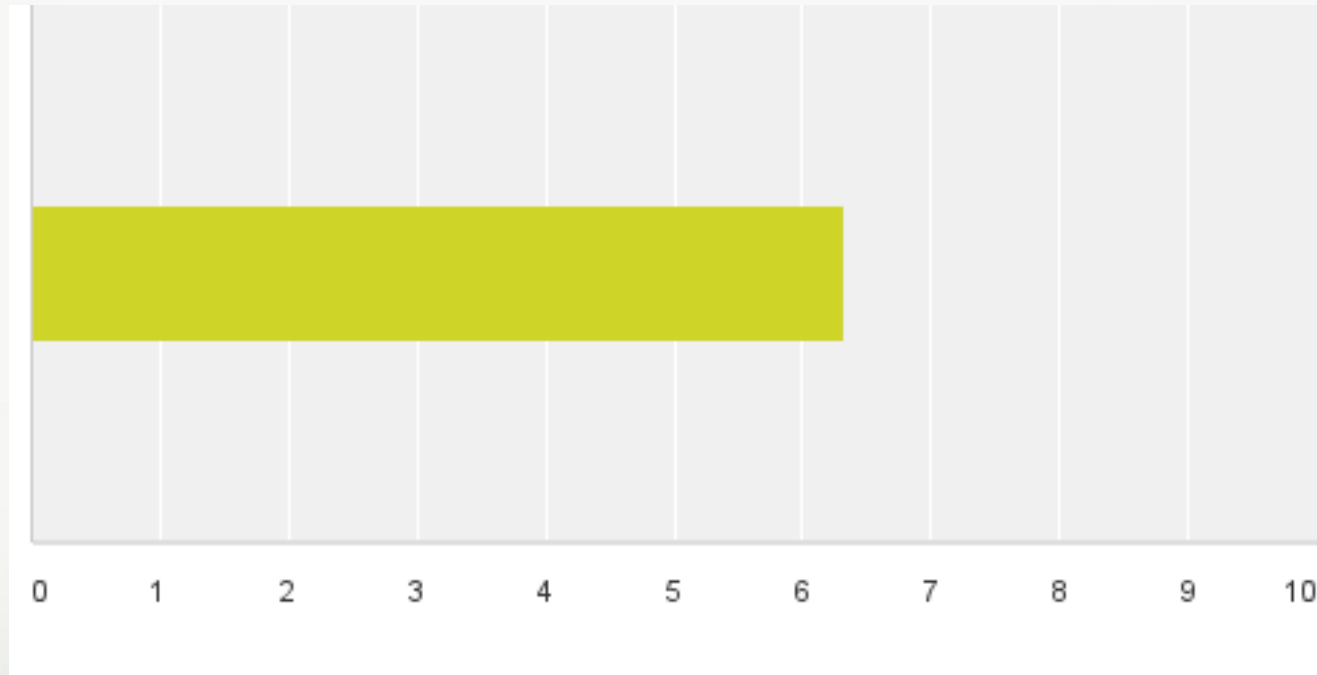
| Answer Choices | Responses | |
|--|---------------|---|
| Development of a U.S. supplier of HLEU. | 69.23% | 9 |
| Addressing transport issues associated with HLEU. | 61.54% | 8 |
| DOE engagement on HLEU. | 61.54% | 8 |
| NRC engagement on HLEU. | 46.15% | 6 |
| Early access to US Government inventories of HLEU. | 38.46% | 5 |
| This issue is not important to our company. | 30.77% | 4 |
| Total Respondents: 13 | | |

Q7: How important is the DOE Loan Guarantee Program potentially to your Advanced Reactor Technology (on a 1 to 10 scale)?



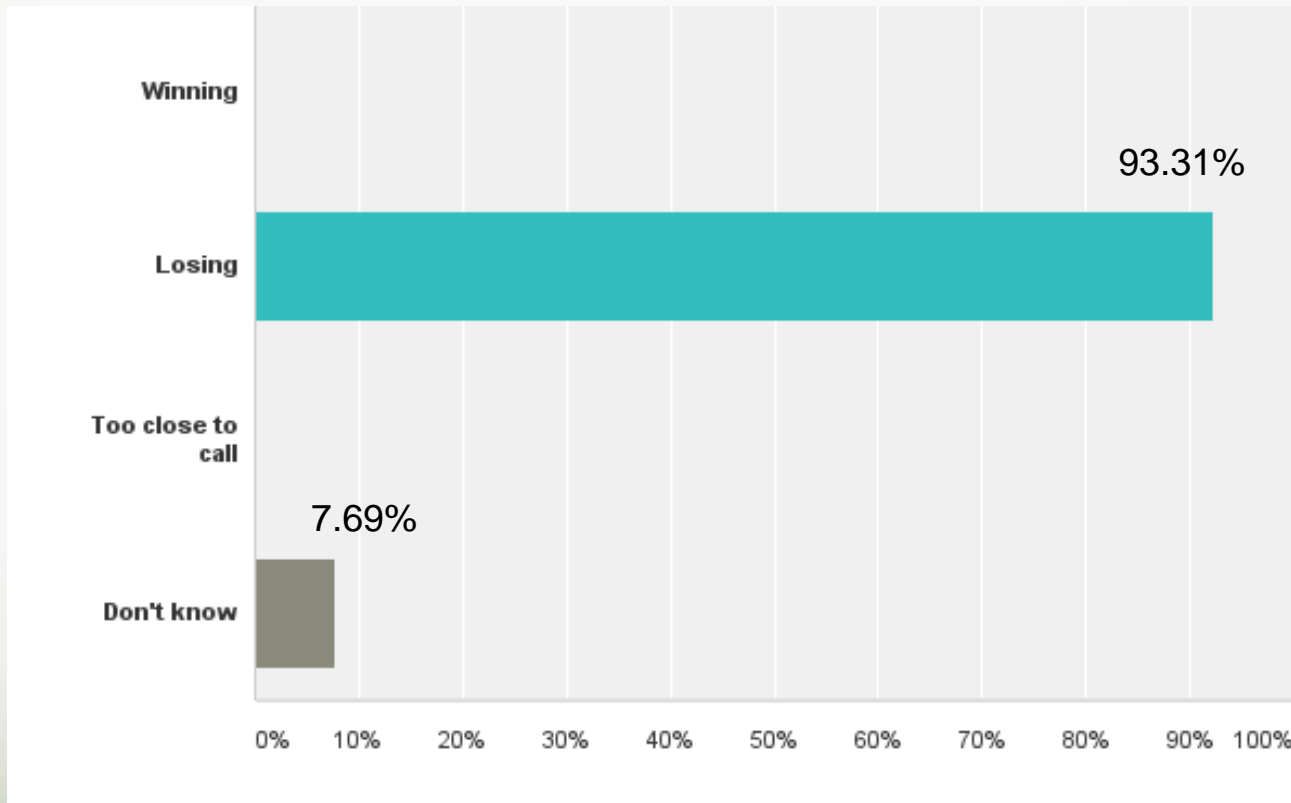
| Answer Choices | Average Number | Total Number | Responses |
|------------------------------|----------------|--------------|-----------|
| | 7 | 84 | 12 |
| Total Respondents: 12 | | | |

Q8: How important is Ex-Im Bank financing potentially for your Advanced Reactor Program (on a 1 to 10 scale)?



| Answer Choices | Average Number | Total Number | Responses |
|------------------------------|----------------|--------------|-----------|
| | 6 | 76 | 12 |
| Total Respondents: 12 | | | |

Q9: How would you assess the US's competing position in the worldwide advanced reactors development market?



The Road Ahead

- The Way Forward Very Clearly Cannot be Status Quo
- Notwithstanding good progress to date, we need a re-doubled effort to include:

NRC:

- Progress toward the 40-month license approval for the NuScale SMR application
- Funding for off-budget NRC readiness on advanced reactors
- Action on generic policy issues
- Tangible reduction in regulatory barriers, cost and schedule uncertainties

DOE:

- Increased funding to accelerate private-public development of designs and fuels
- Path forward on high-assay LEU
- Strategy for deployment of a new advanced test reactor

The Road Ahead... continued

CONGRESS

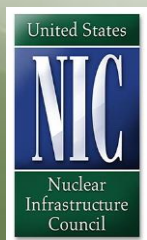
- Passage of the NEIMA and NEICA bills and related legislation
- Increased prioritization for Advanced Reactors appropriations
- Continue support for advanced nuclear loan guarantees

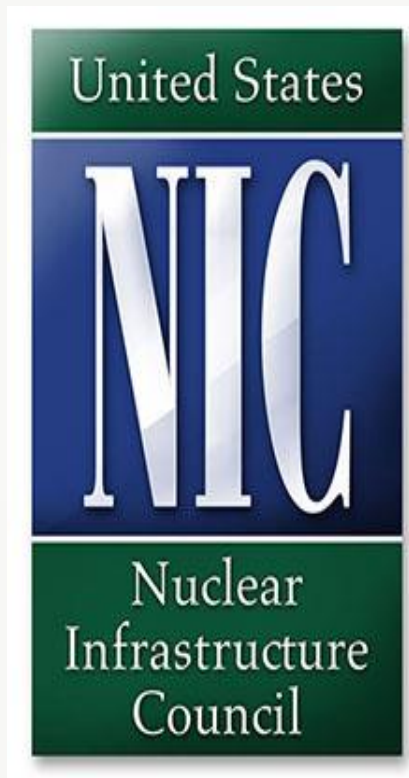
WHITE HOUSE

- Re-nomination of Chairman Svinicki and nomination of two well-qualified Commissioners
- Support for “developing, deploying and commercializing breakthrough technologies”
- Operational EX-IM Bank

About the USNIC

- Leading business consortium advocate for increased U.S. nuclear energy use and global deployment of American nuclear technologies and services
- Represents nearly 90-member companies encompassing wide representation of the nuclear energy supply chain and key movers
- Member of the U.S. Civil Nuclear Trade Advisory Committee and Chair of the Advocacy Subcommittee
- USNIC encompasses eight working groups and select task forces, including:
 - Advanced Manufacturing & Supply Chain
 - Back-End
 - International
 - Advanced Reactors Task Force
 - Environmental Management Task Force
 - Nuclear Transportation Task Force
 - Nuclear D&D Task Force
 - Outreach & Programs
- Strongly supports Gen 3+ reactors, small modular reactors and advanced reactors moving in parallel paths





The United States Nuclear Infrastructure Council (USNIC) is the leading U.S. business consortium advocate for nuclear energy and promotion of the American supply chain globally. Composed of nearly 90 companies USNIC represents the "Who's Who" of the nuclear supply chain community, including key utility movers, technology developers, construction engineers, manufacturers and service providers. USNIC encompasses seven working groups and select task forces. For more information visit www.usnic.org

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