



# ScottMadden's Energy Industry Update: Still Haven't Found What I'm Looking For

Webinar

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November 11, 2021



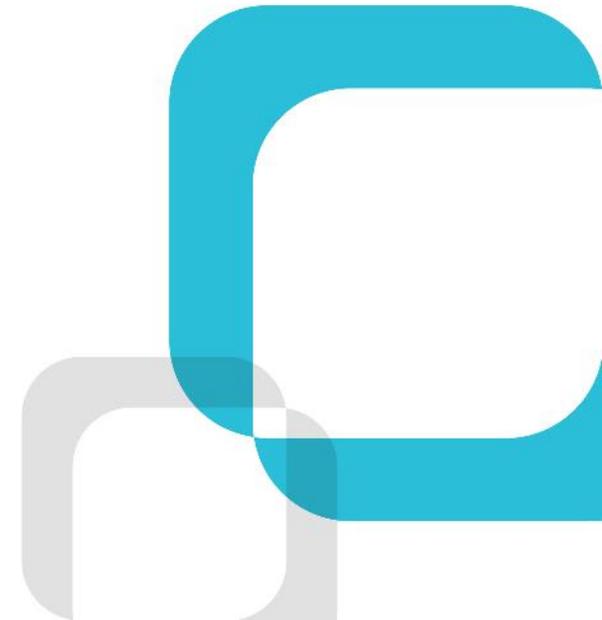
Smart. Focused. Done Right.®



## Cristin Lyons

Partner and Energy Practice Leader

Cristin Lyons is a partner with ScottMadden and leads the firm's energy practice. Since joining the firm in 1999, Cristin has consulted with myriad clients on issues ranging from process and organizational redesign to merger integration to project and program management. Cristin led the firm's grid transformation practice for three years before becoming the energy practice lead. She is a frequent speaker and panelist at conferences across the country. Cristin earned a B.A. in political science and Spanish from Gettysburg College and an M.B.A. from the Cox School of Business at Southern Methodist University. She is also a member of Phi Beta Kappa.



# Energy Is Who We Are

ScottMadden is a management consulting firm with more than 35 years of deep, hands-on experience. We deliver a broad array of consulting services—from strategic planning through implementation—across the energy utility ecosystem.

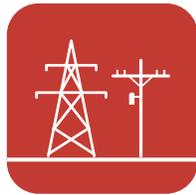
Our energy practice covers the following areas:



**GENERATION**



**RATES &  
REGULATION**



**TRANSMISSION &  
DISTRIBUTION**



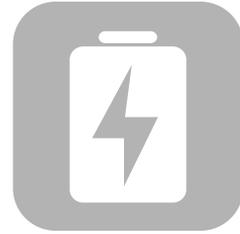
**ENERGY  
MARKETS**



**GRID EDGE**



**ENERGY  
CORPORATE  
SERVICES**



# Energy Storage

PRESENT AND FUTURE

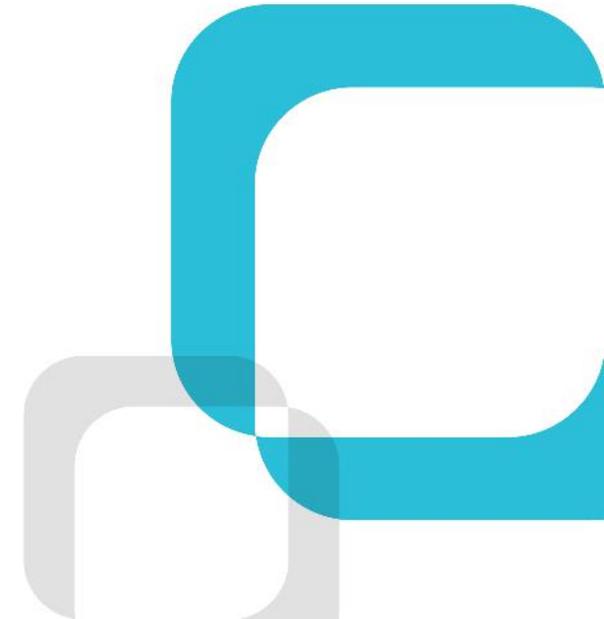




## Josh Kmiec

Director

Josh Kmiec joined ScottMadden in 2014 after receiving an M.B.A. from the University of North Carolina Kenan-Flagler Business School, concentrating in consulting, sustainability, and marketing. His experience includes work in grid transformation and integration of distributed energy resources, regulatory reform, grid modernization, energy efficiency, post-merger integration, and electric vehicles. Prior to working at ScottMadden, Josh served as an intelligence officer in the U.S. Air Force for eight years. In addition to an M.B.A., he received an M.A. in international relations from the University of Oklahoma and a B.A. from the University of Massachusetts–Amherst, with a major in political science and a minor in history.



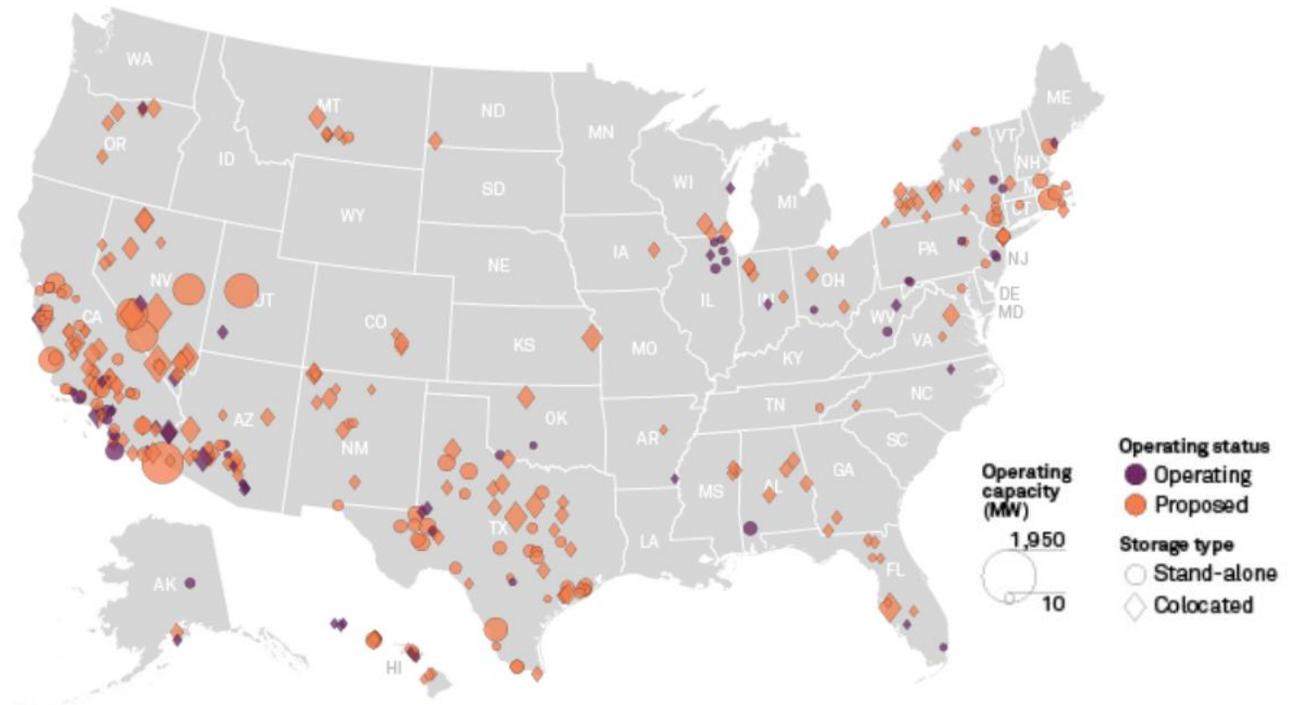
# Rapid Expansion in the Near-Term

Energy storage is moving beyond early markets (PJM, California) to establish some presence across much of the United States, particularly lithium-ion batteries.

## Driving Forces:

- Significant growth in 2021, U.S. capacity added expected to almost quadruple compared to 2020<sup>1</sup>
- Rapidly decreasing costs for utility-scale lithium-ion batteries
- Supportive policies
  - Investment Tax Credit (ITC) for storage paired with solar
  - State mandates
  - Potential future federal policy action
- Diverse applications<sup>2</sup>
  - U.S. use cases still dominated by frequency regulation and ramping and spinning reserve (59% and 39% respectively by capacity)
  - Load following, excess wind and solar generation, and system peak shaving still relatively nascent (26%, 17%, and 15% respectively)

## U.S. Utility-Scale Energy Storage Projects (as of July 2021)



**Notes:** Data compiled July 23, 2021. Excludes projects classified as pumped storage and projects that are less than 10 MW in capacity.

**Source:** S&P Global Market Intelligence

<sup>1</sup> Wood Mackenzie and Utility Dive

<sup>2</sup> U.S. Energy Information Administration (Note: some energy storage systems cite more than one use case)

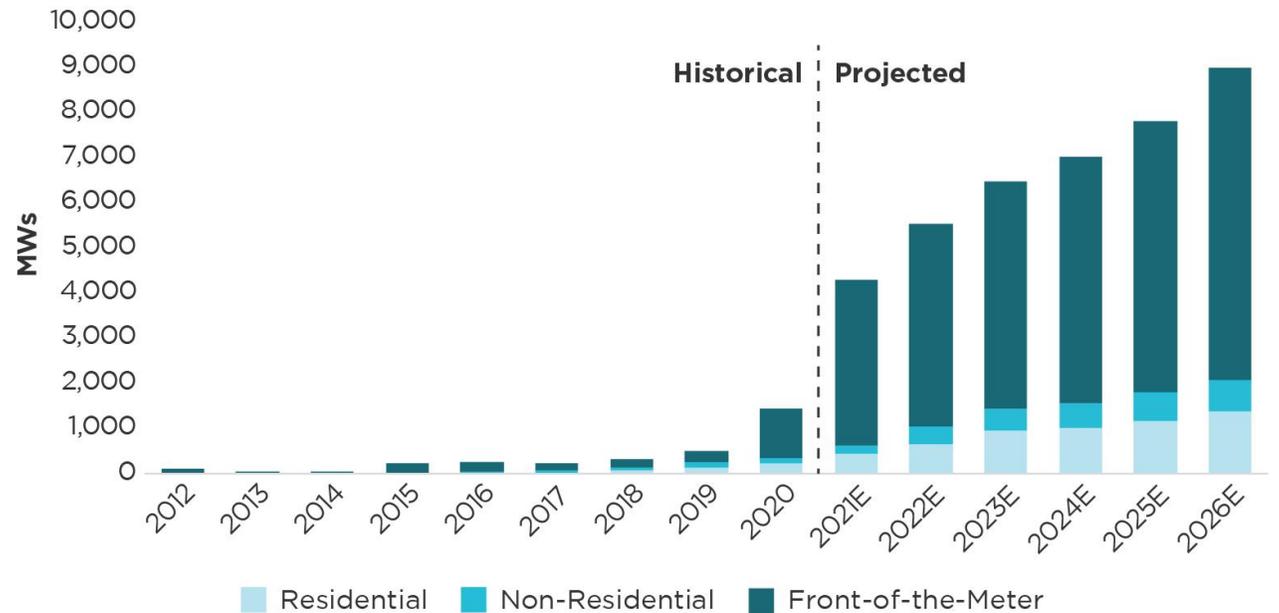
# Potential Restraints on This Rapid Expansion

Declining costs and supportive policies continue to drive growth, but some headwinds, such as supply chain concerns, remain.

## Restraining Forces:

- Supply chain concerns
  - Limited domestic participation in upstream and midstream production
  - Competition with electric vehicles
- Interconnection challenges
- Predominant current technologies, dominated by lithium-ion, are not well-suited for long-duration applications

### Annual Energy Storage Capacity Additions (MWs) (2012-2026E)



Source: Wood Mackenzie

Note: E means estimated.

## Emergence of Long-Duration Storage

The demand for long-duration storage (i.e., more than eight hours) is expected to increase, and a number of pilots/demonstrations will likely be coming online in the next few years.

### Driving Forces:

- Diverse set of emerging technologies
- Technologies that don't rely on lithium-ion:
  - Avoid various supply chain issues
  - May rely on cheaper non-rare-earth metals
- Some technologies incorporate both energy and power components
- Potential to scale with minimal marginal cost for some technologies
- Supportive policies
  - DOE's Long-Duration Storage Shot
  - Increased renewable penetration may result in increased demand

### DOE's Long-Duration Storage Shot



**Reduce storage costs by 90%  
from a 2020 Li-ion baseline...**



**...in storage systems that  
deliver 10+ hours of duration**



**...in 1 decade**

Source: DOE

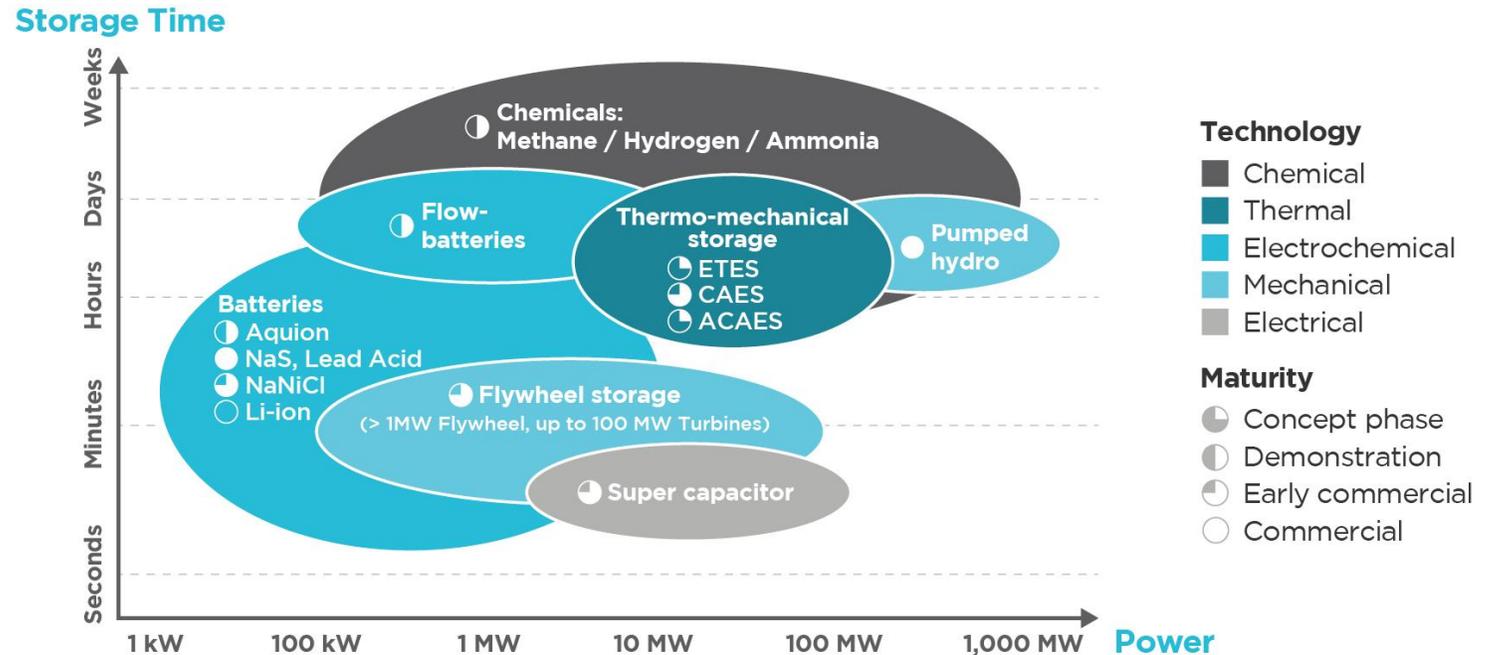
# Potential Restraints on Long-Duration Storage

Long-duration storage faces some of the same challenges as current lithium-ion as well as others associated with new technologies.

## Restraining Forces:

- Lack of regulatory framework to adequately compensate in some cases
- Interconnection challenges
- Some technologies are constrained by geography
- Some technologies remain unproven at scale

Comparison of Different Storage Technologies



Notes: ETES is electro-thermal energy storage; CAES is compressed air energy storage; ACAES is adiabatic compressed air energy storage.

Sources: Siemens; Progress in Energy and Combustion Science (Nov. 2018)

# An Energy Storage Planning Approach for Utilities

Rapid advancement in energy storage technologies is presenting utilities with significant opportunities, but capturing these opportunities requires careful planning.

## Develop Roadmap



**Develop an energy storage roadmap** that defines the specific objectives and assesses the overall environment for these investments. A successful roadmap will define a prioritization structure and interdependencies while also considering evolving policy implications.

## Assess Market



**Assess market opportunities** based on regional market conditions and potential storage applications. Regional opportunities for storage are especially unique due to market and policy differences and many factors should be considered.

## Identify Energy Storage Options



**Identify energy storage opportunities** and understand their impact on utility operations and business models. Key considerations include technology, applications, and associated risks.

## Key Takeaways

### Energy Storage Today and in the Future

#### Rapid Expansion Today

- Energy storage is expanding rapidly across much of the United States, particularly lithium-ion batteries.
- Declining costs and supportive policies continue to drive growth, but some headwinds remain.

#### Emerging Long-Duration Storage

- The demand for long-duration storage is expected to increase.
- A number of pilots/demonstrations will likely be coming online in the next few years.

#### Utilities' Approach

- Rapid advancement in energy storage technologies is presenting utilities with significant opportunities, but capturing these opportunities requires careful planning.



# ESG Reporting

ESG PERFORMANCE EVOLVES AS DEMAND FOR DISCLOSURE GROWS

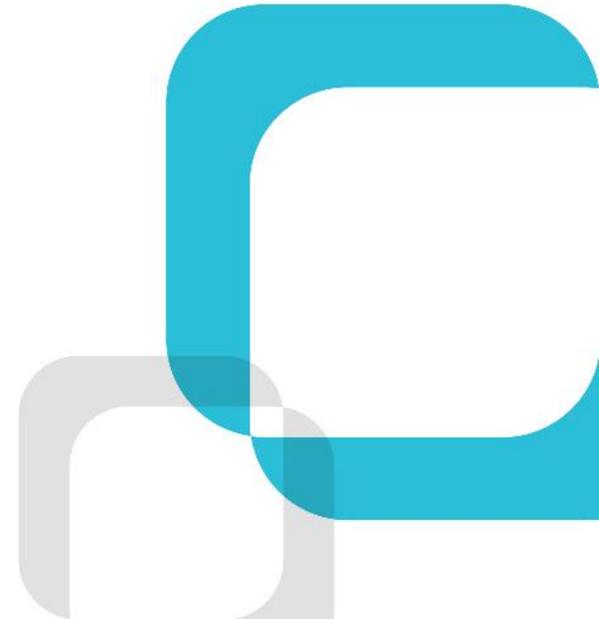




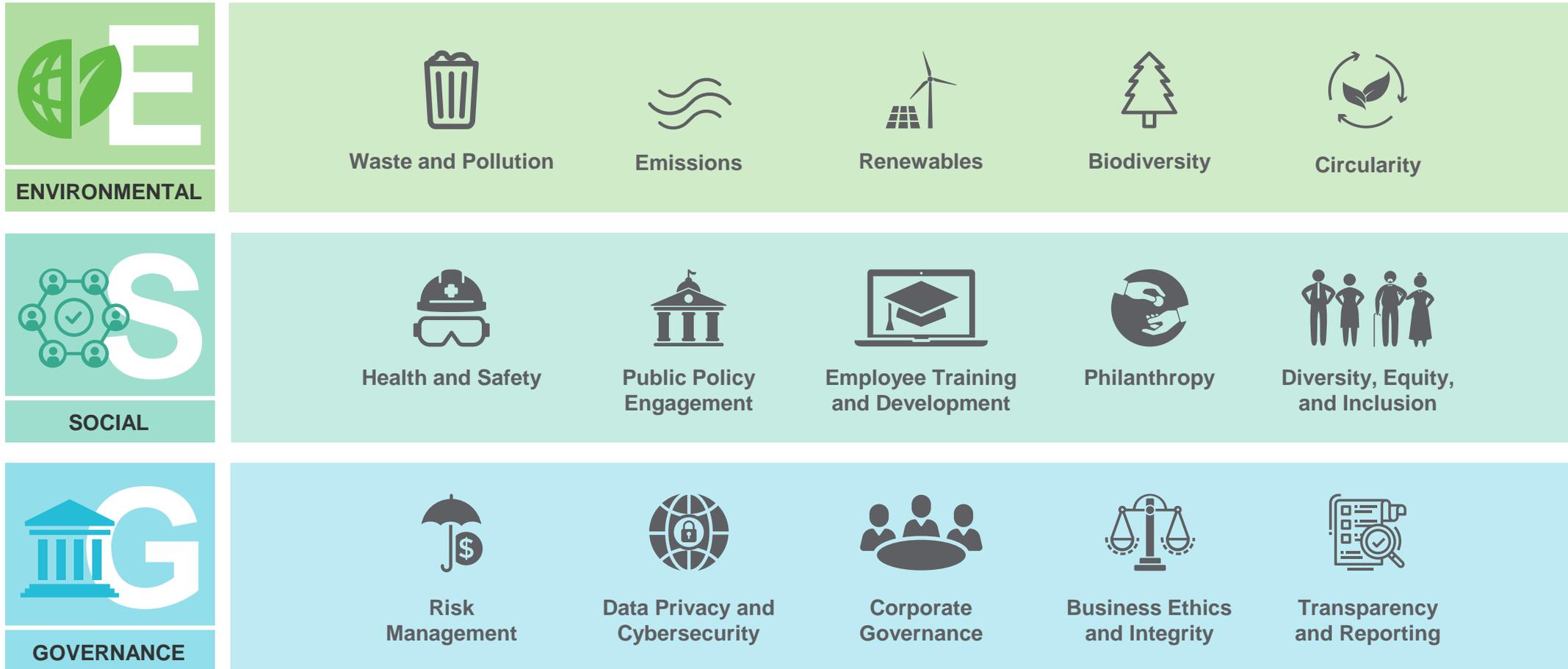
## Theo Tran

### Manager

Theo Tran is a manager with ScottMadden. Her experience includes work in corporate sustainability, energy efficiency, and clean energy. She is also ScottMadden's sustainability lead and a member of the firm's ESG Committee. Prior to joining ScottMadden, Theo worked with the Rocky Mountain Institute where she was responsible for developing a tool to help North American universities identify hotspots for carbon-emissions reductions. She was also a TEFL Peace Corps Volunteer in Ukraine, and during her service, she led a national water testing initiative. Theo earned a Master of Environmental Management from Duke University, an M.B.A from UNC Chapel Hill, and a B.S. in biology from UCLA.

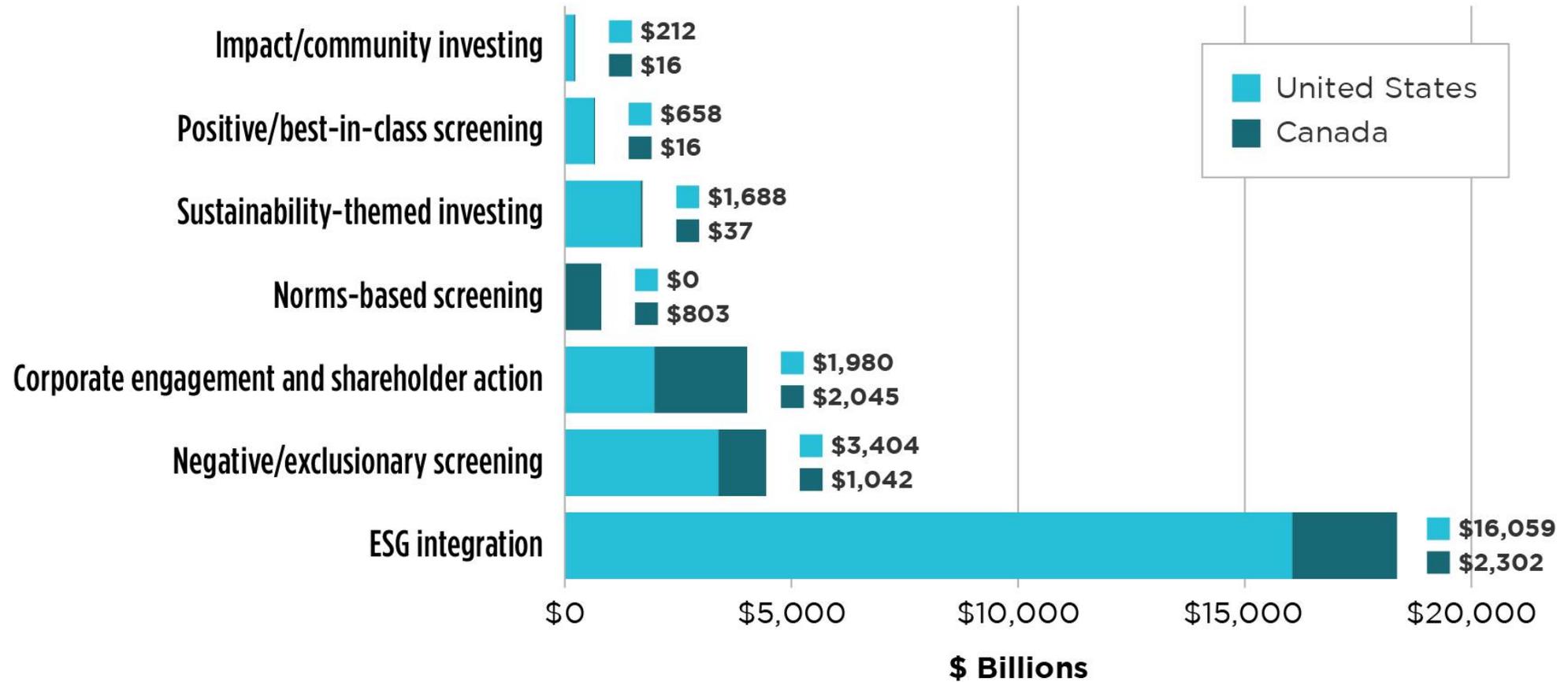


# What Is “ESG”?



# ESG-Driven Investing Continues to Accelerate

U.S. and Canadian Sustainable Investing Assets by Strategy (2020)



Source: Global Sustainable Investment Alliance

Notes: Amount expressed in U.S. dollars.

# ESG Frameworks – One Size Does Not Fit All

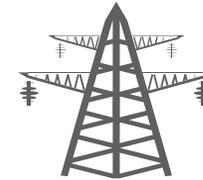
The absence of a universal standard for reporting has led to the development of various frameworks with differing intended audiences and scopes.



Investors



Stakeholders



Sector-Specific



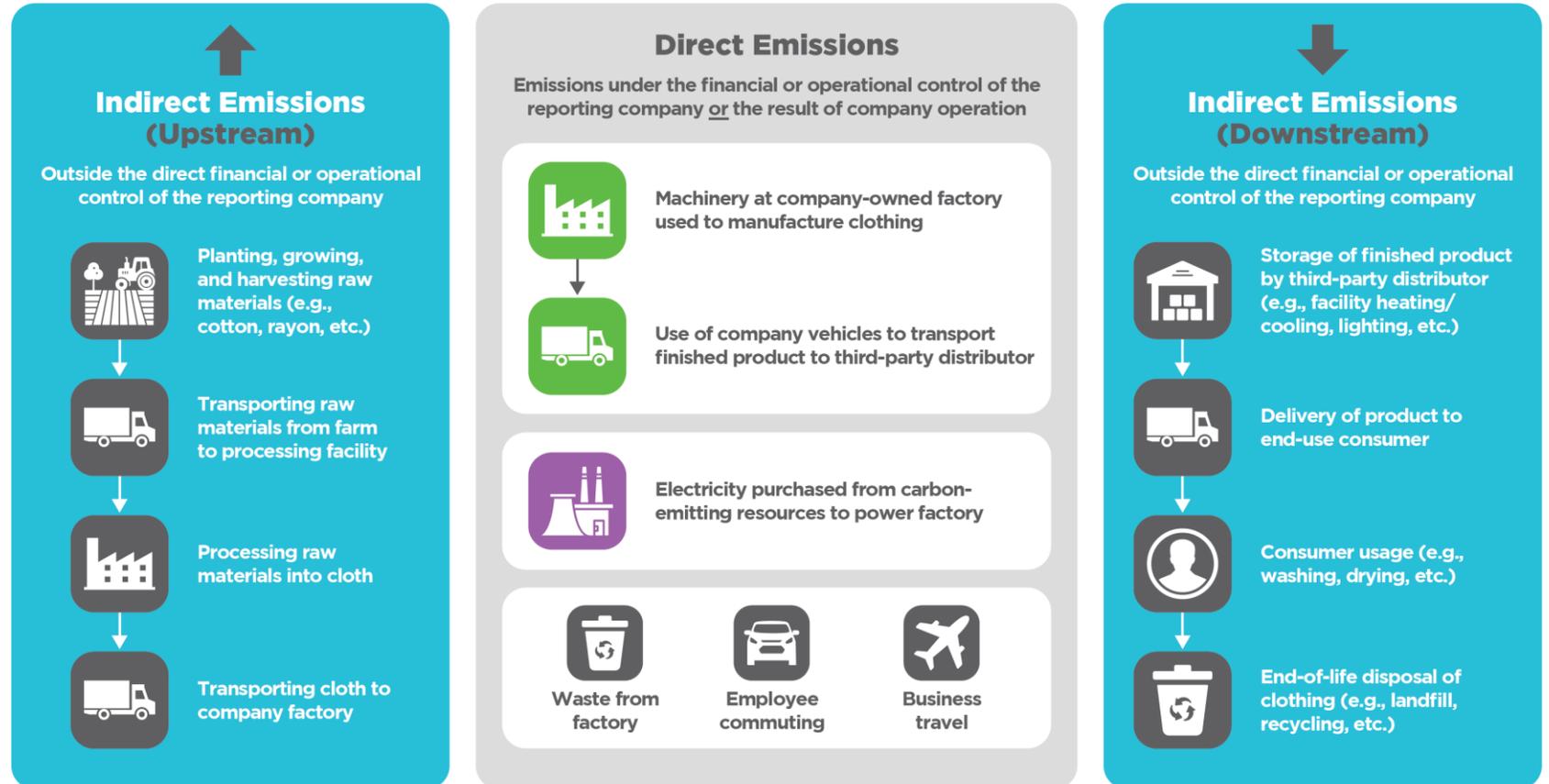
Edison Electric  
INSTITUTE



# The Ecosystem View Will Become More Important

Illustrative Scope 1-2-3 Emissions View for a Textile Manufacturer

As the ESG reporting industry matures, companies are finding that taking an **ecosystem approach** to their ESG issues is increasingly important to capturing and influencing activity beyond their direct operations.



Legend: Scope 1 Scope 2 Scope 3

# Increasing Support and Potential Regulation

 The New York Times

## G20 Nations Agree to New Limits on Coal-Burning Power Plants

The G20 statement did pledge to end the practice of financing coal power plants in foreign countries, which in recent years had been a way for...

22 hours ago



 Bloomberg Law

## ESG Disclosure Plans Emerge as Corporate Priority, Study...

Another third, or 34%, plan to implement ESG reporting strategies in the next one to two years, said the report, compiled by law firm...

2 weeks ago



 Accounting Today

## Corporate directors see ESG reporting as necessity

The survey also found that only 25% of the 815 directors polled say their boards have a strong grasp of ESG risks, while only 28% of directors...

3 hours ago

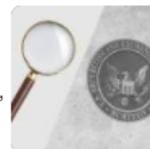


 Barron's

## SEC Probing How Advisors Market ESG Investing

The ESG environment seems far from settles, according to Kristin Snyder, deputy director of the SEC's Division of Examinations,...

1 day ago



 National Law Review

## SEC ESG Focus: Climate Change Disclosure Rule Evaluation

SEC Continues to Drive ESG — Climate Change Disclosure Takes the Wheel. Wednesday, October 6, 2021. In late September, the SEC's Division of Corporation...

1 week ago



# ESG Reporting Implications

## Data Management

Companies will need to be able to quickly identify various data sources and easily extract relevant data while also ensuring data integrity.



## Centralized ESG Governance

Centralized governance and oversight at the highest levels of the organization are increasingly important as ESG becomes more scrutinized.



## Increased Scrutiny

Companies will need to ensure that all forms of reporting (e.g., SEC, ESG) are harmonized and don't open the company up to risk.



## Ecosystem View

Companies that work more closely with their stakeholders to evaluate impact will be able to capture more value.



## Key Takeaways

### ESG Reporting: Reporting ESG Performance Evolves as Demand for Disclosure Grows

#### “E” Remains Important Focus

- Sustainability and ESG are gaining traction and garnering increasing support.
- While the “G” and especially “S” components are drawing interest, the “E” remains an important focus for energy and utility companies, particularly around greenhouse gas emissions

#### Push for Standardizing ESG

- ESG reporting is currently voluntary, and multiple reporting frameworks have been developed to address various audiences and scopes.
- Currently, there is a push for standardizing ESG principles and disclosure rules.

#### Support for Initiatives

- The current administration has signaled support for sustainability initiatives.
- Companies should continue to monitor regulations and prepare themselves to respond (e.g., improving data management and visibility, establishing centralized ESG governance).



# Small Modular Reactors (SMRs)

GAINING TRACTION OR DISAPPOINTMENT AHEAD?

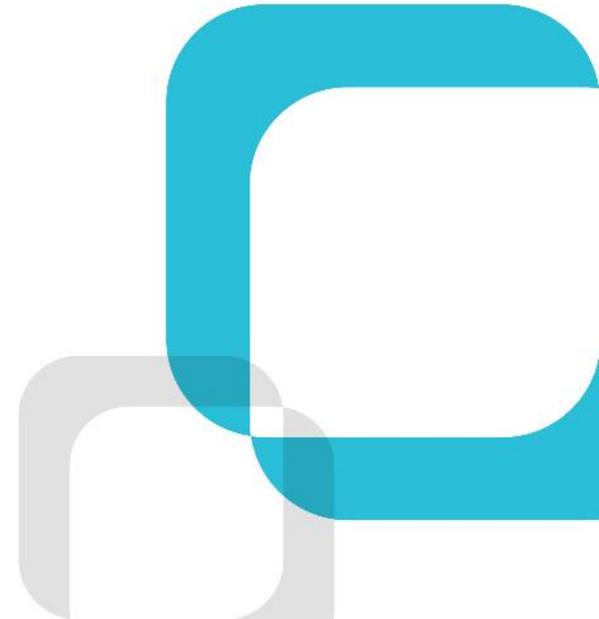




## Morgan Schadegg

Senior Associate

Morgan Schadegg joined ScottMadden in 2019. Before joining the firm, Morgan worked as a project manager for Certrec Corporation, a regulatory compliance service provider for energy utilities. Prior to Certrec, Morgan worked as a systems engineer at a dual-unit nuclear power utility managing a multitude of secondary water, compressed air, and security systems. Morgan holds an M.B.A., with concentrations in strategy and marketing, from Southern Methodist University and a B.S. in chemical engineering from Arizona State University.



## How Do SMRs Differ from Current Nuclear Power Plants?

There are five main areas of difference between SMRs and current “big nuclear” plants.

### SIZE

Electricity outputs of 300 MWs or less, even down to 1 MW micro-reactors

### CONSTRUCTION

Modular, factory-built construction to lower capital build costs

### DESIGN

Several designs are being pursued  
Overall, designs are heavily simplified

### SAFETY

Reduced emergency planning zone, remote operations, reduced security threat

### FLEXIBILITY

The ability to match electricity output to demand

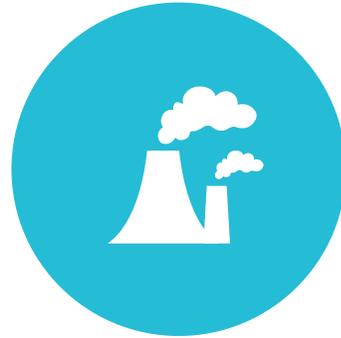
## Potential Opportunities for SMRs

SMRs could play a large role in meeting carbon-free goals.



### Generation Flexibility

The flexibility of SMRs to serve as baseload or ramping generation is an advantage to the grid. Unlike renewable resources, traditional nuclear power output does not depend upon intermittent resources, like wind speed and ultraviolet rays.



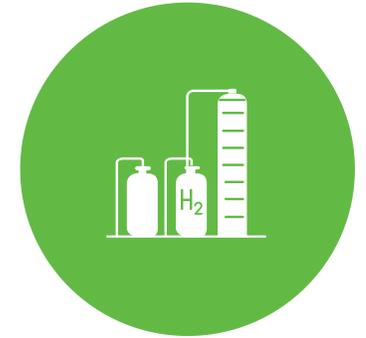
### Direct Coal Replacement

SMRs could be easily sited on brownfield sites in place of decommissioned coal-fired plants. Not only could existing infrastructure be utilized, but the transition could benefit the local community.



### Servicing Smaller Grids

Flexibility in sizing for SMRs means a great opportunity to service smaller grids. Micro-reactors (~1 MW) could service remote locations, such as military bases.



### Product Production

SMRs could also serve as a carbon-free method of producing other products, such as district heat or hydrogen. An SMR could also be used for desalination or mining cryptocurrency.

# SMRs Continue to Garner Interest Around the World

- **United States:** Advanced reactors should be operational within seven years through industry partnerships and programs
- **Canada:** Targeting commercial operation of the first SMRs in late 2020s
- **United Kingdom:** Aiming to deliver an advanced modular demonstration reactor by the early 2030s

Timeline of Deployment of SMR Designs to 2030



# Harmonizing Regulations and Dependable Supply Chains

To achieve long-term financial success, SMR developers require technology adoption, and production levels drive economies of scale and learning. For most, securing a global market is critical.



## Regulation

- National differences in processes can lead to a patchwork for approval in different countries
- Industry and government collaboration will be crucial to move forward. Current collaborative examples are:
  - **International Atomic Energy Agency** SMR Regulators' Forum
  - **Canadian Nuclear Safety Commission** and **Nuclear Regulatory Commission** Memorandum of Cooperation



## Supply Chain

- Preserving and enhancing nuclear supply chains is a current priority. Items of current discussion are:
  - Increased vendor oversight for “long lead-time items”
  - Maintenance of critical nuclear workforce skills
  - Early developer focus on sourcing and quality

## Key Takeaways

### Small Modular Reactors Could Play a Large Role in Meeting Carbon Goals

#### New Technologies

- Advanced nuclear could lower industry barriers to entry compared to current nuclear power plants.
- Decreased capital costs and increased safety through new technologies could play a large role in increasing development for the future.

#### Various Applications

- Broader applications (e.g., district heating, hydrogen production, and remote power) are being considered.
- The flexibility of SMRs offers great potential for assisting in meeting carbon-free goals.

#### Development Progressing

- Countries with active nuclear sectors continue to make progress in SMRs through supportive policies and funding.
- While only one SMR for power generation has been successfully deployed at commercial scale, several countries are moving toward licensing and construction.

#### Harmonization

- Importantly, regulatory and supply chain harmonization and shared learnings will accelerate the review process for new units.

# YOUR WEBINAR PRESENTERS



**Cristin Lyons**

Partner and  
Energy Practice Leader



**Josh Kmiec**

Director



**Theo Tran**

Manager



**Morgan Schadegg**

Senior Associate

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