

# Project Developers Panel



**Marc Prasse**

- Sargent & Lundy
- Project Engineer
- Hydrogen and Clean Fuels Team and hydrogen process owner



**Anthony Borski**

- Nel Hydrogen
- Director of Program Management Office in PEM division
- Oversees megawatt-scale projects



**Cameron Martin**

- Westinghouse
- Director of Global Technology Development
- Oversees decarbonization efforts and next-gen reactors

**Robert Beaumont**

- Constellation

# **DOE Electrolyzer Installation Workshop Project Developers Panel**

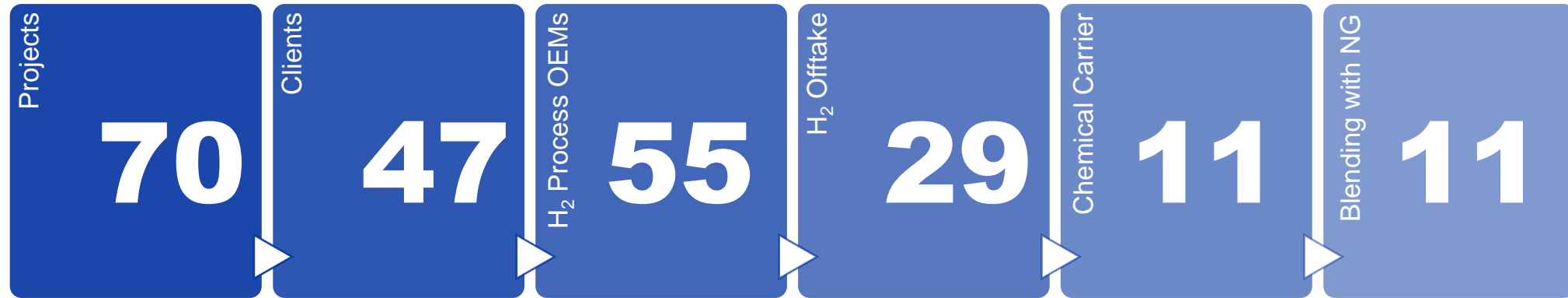
**Marc Prasse, P.E.  
Project Engineer  
September 26, 2023**

# Bio & Introduction

- Project Engineer at Sargent & Lundy in Chicago, IL
  - 4 years with S&L
  - Hydrogen, electric power generation, and decarbonization projects
  - Hydrogen Equipment and Systems Process Owner
  - Dozens of H<sub>2</sub> Projects from feasibility studies through detailed engineering and design
- 6 years previously in Oil & Gas, specifically refineries
- Bachelor's degrees from Illinois Wesleyan University in Physics, University of Illinois at Urbana-Champaign in Mechanical Engineering
  - Working on Master's of Engineering in Energy Systems at UIUC
- Husband of Kelsey, father of Tessa, dog dad of Andy 😊



# Sargent & Lundy Hydrogen Experience



## Electrolyzer Production



120kW – 2.2GW

- PEM
- Alkaline
- SOEC

From Wind,  
Solar, Hydro,  
Nuclear, Grid

## Other Clean Production



CCUS coupled  
with:

- SMR
- ATR
- POx
- Gasification

Scale:

- Modular
- Utility-scale

## Uses



Export/Sale:

- Gas/Liquid
- NH<sub>3</sub>, MeOH, SAF

Power-to-Power

- Blending
- 100% H<sub>2</sub>

Mobility

- Forklifts
- Class 8

## Markets



- Power
- Utility
- Industrial
- Oil & Gas
- Transportation
- Retail
- Commercial
- OEMs

## Scope



- Pre-FEED/FEED
- Conceptual
- Detail Design
- Cost Estimates
- Owner's Engineer
- EPC Engineer
- Strategic Planning

- Members of CHS & CHBC
- Participate in ASME B31.12, NFPA 2, and other codes committees
- Active efforts with several National Labs, EPRI Utilities, Developers, IPPs, OEMs, and more

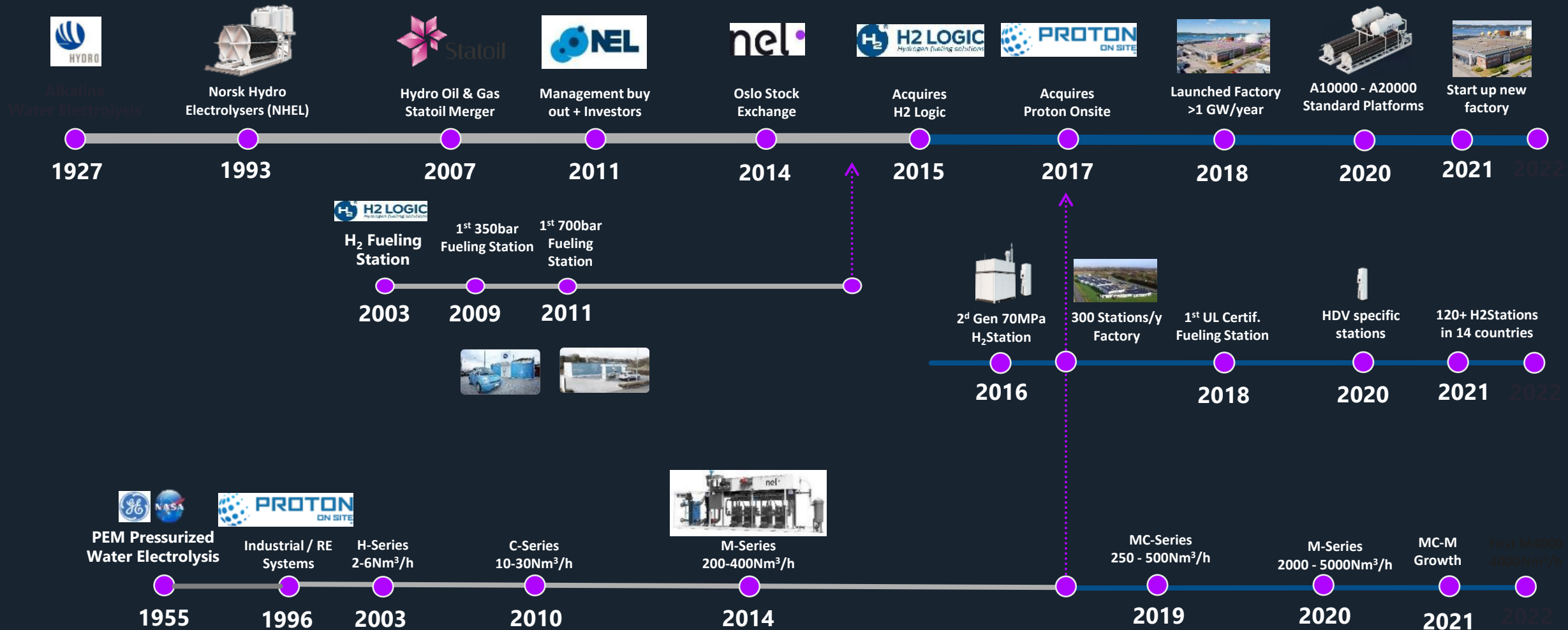




# Nel Hydrogen

Company Presentation

# >95 Year Experience / Extended Field Know-How



# Strong field know-how and manufacturing capacity

## PEM water electrolyzers

Wallingford, USA



Systems delivered: **2,700+**  
Nameplate capacity: **100 MW/year**  
Experience: **≈25+ years**

## Alkaline water electrolyzers

Notodden/Herøya, Norway



**850+**  
**500MW/year**  
**≈ 95+ years**

## Hydrogen refuelling stations

Herning, Denmark



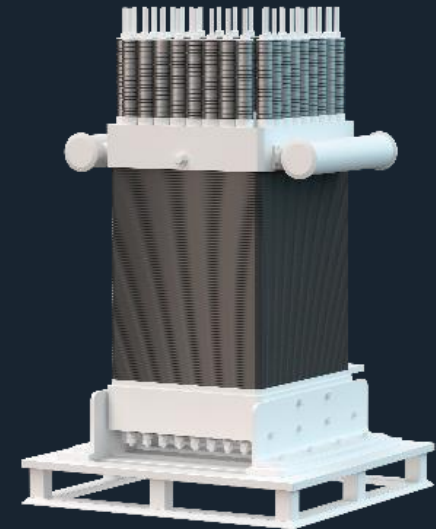
**120+**  
**300 HRS/year**  
**≈ 20+ years**



# Industrializing the PEM platform



- Scaling up and automation will drive down cost
- Reducing overall material usage
- Driving energy savings



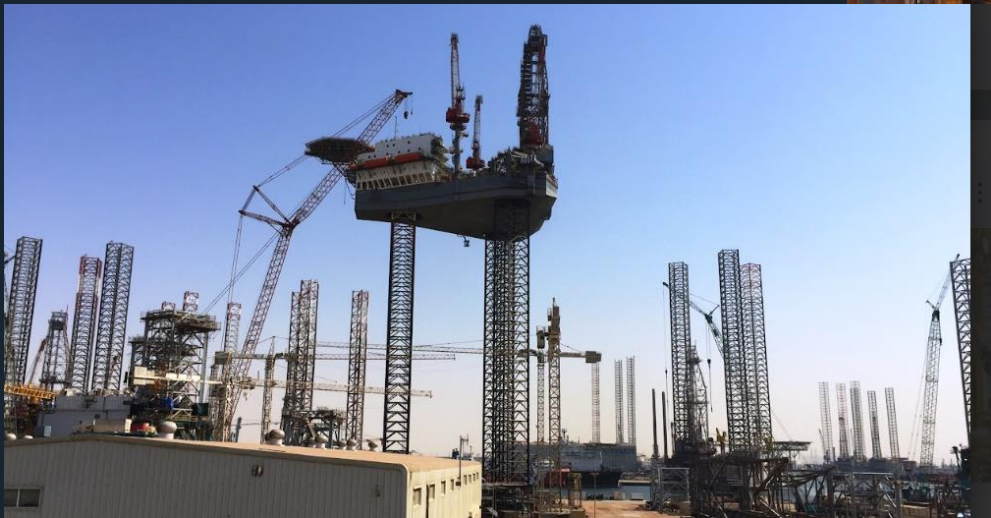


## 2023 MC and M Series Fleet Sites and Locations





# Anthony Borski Background





# Ultra-Efficient, Clean Hydrogen

A new revenue stream for nuclear assets



# Deep History of Innovation

*Established nuclear solutions provider*

- ▶ Founded by George Westinghouse in 1886
- ▶ USS Nautilus (commissioned 1954)
- ▶ World's first commercial pressurized water reactor (PWR) in 1957 in Shippingport, Pennsylvania, U.S.
- ▶ Responsible for some of the world's greatest advances and innovations in energy technology
- ▶ Key partner in solving the global energy challenge
- ▶ **1st and only U.S.-based company to bring GEN III+ Nuclear Power technology to commercialization**

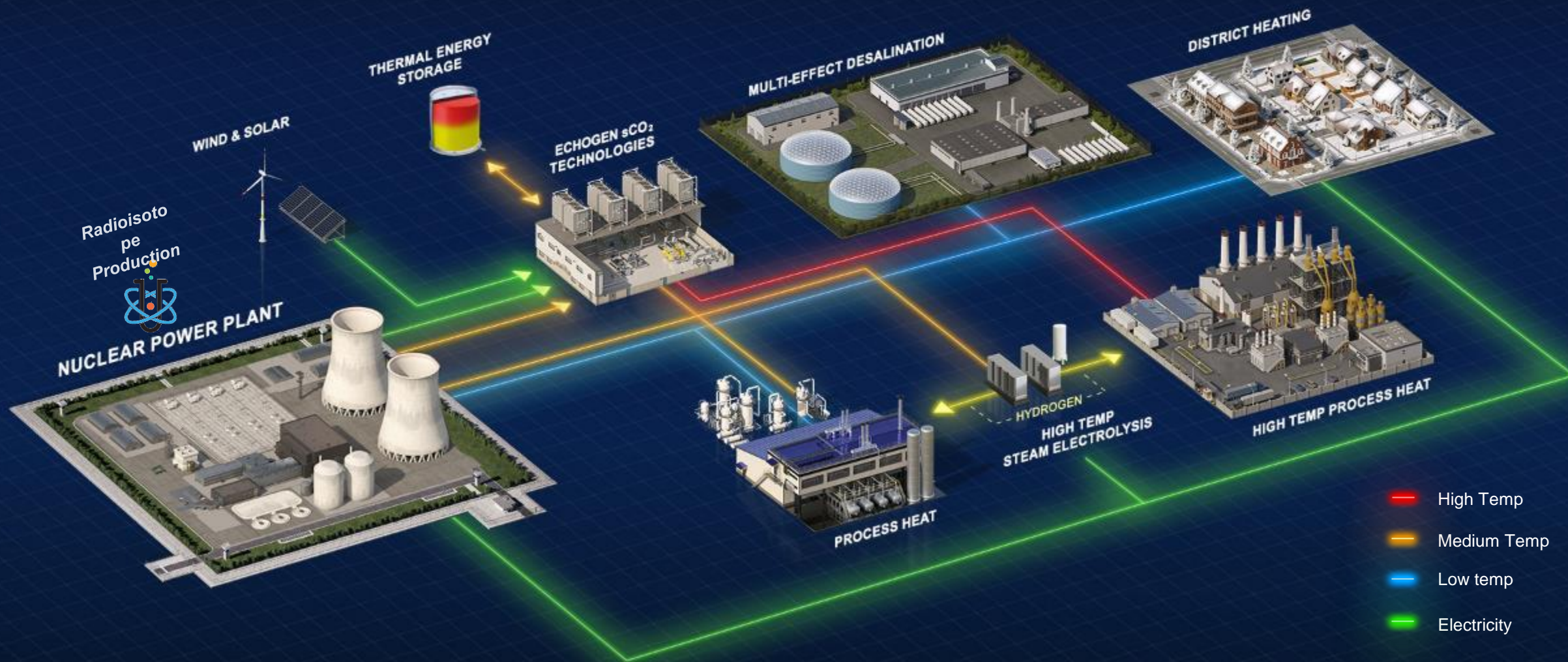


More Than  
**137**  
Years of Innovation

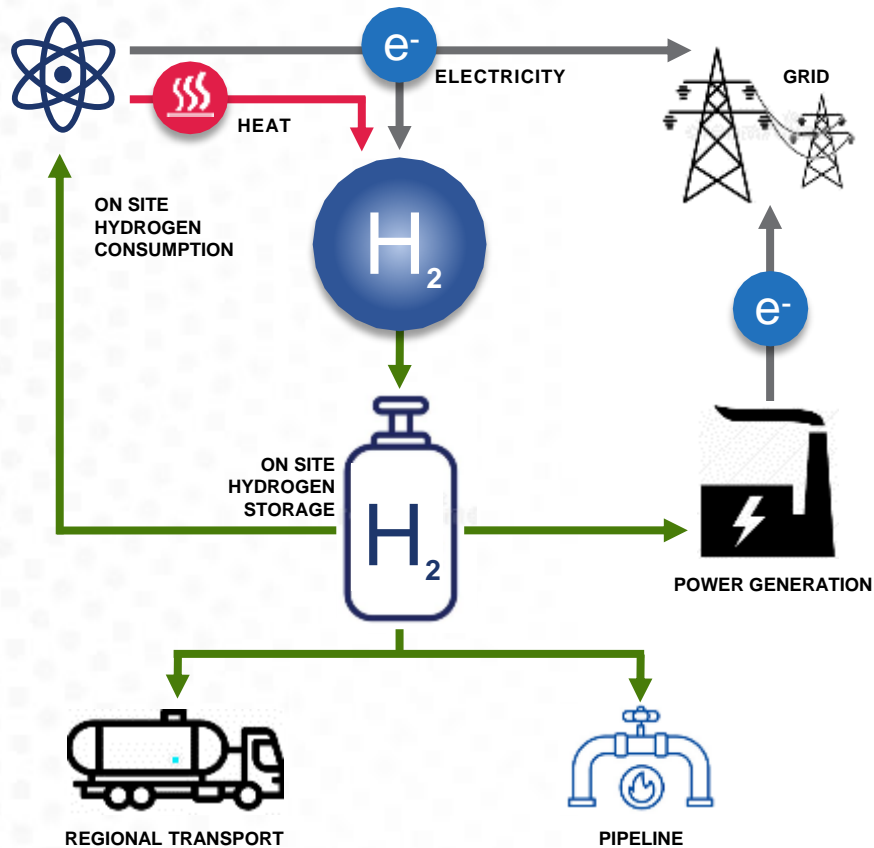


# Beyond Electricity

Nuclear Power Plants to Serve a wide variety of Decarbonizing Initiatives beyond Low-Cost Electricity



# Nuclear + Hydrogen



**Nuclear power will play a lead role in delivering clean, efficient and reliable hydrogen production economically and at scale, critical to meeting global decarbonization goals.**

## OPPORTUNITY

Global demand for hydrogen and its emerging applications could increase by a factor of ten by 2050, surpassing our current infrastructure for producing and delivering hydrogen. Paired with increasing global pressure to decarbonize, this has created a unique opportunity for nuclear power plants to deliver clean hydrogen at scale.

## NUCLEAR'S ROLE

Nuclear plants are uniquely and ideally suited for providing energy for hydrogen production

- Reliable, non-intermittent source of power, both electricity and heat
- Higher power density per square foot
- Carbon-free source of power for “clean” hydrogen production
- Abundant, low-cost power to produce cheapest and cleanest hydrogen

## WESTINGHOUSE'S ROLE

***Westinghouse is ideally suited to support utilities for hydrogen production, providing seamless integration services across a wide range of production scenarios.***

- Utilization of institutional knowledge and expertise that build upon our core competencies and strengths:
  - Plant secondary-side integration (electrical and thermal)
  - Reactor Controls
  - Digital I&C / Main Control Room modifications
  - Systems Engineering, Components & PRA
  - Fuel & Safety Analysis
  - Licensing
  - Multiple reactor technologies and designs – PWRs, BWRs, Adv Reactors
- Subject matter expertise of the nuclear processes required to support hydrogen production (extracting MWt steam and MWe electricity for electrolysis).
- Power uprate services to increase current thermal and electrical production to support hydrogen generation.