ENERGY WORKFORCE & TECHNOLOGY COUNCIL

The Vital Role of Oil & Gas in Energy Transition

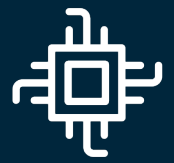
Leslie Beyer, CEO

TRAIN. ELEVATE. NETWORK.

Who Is The Council?

National trade association for the energy technology and services sector, representing 600,000+ jobs in the technology-driven energy value chain

The 2021 merger of AESC and PESA unites the OFS sector to form **the largest energy technology** and **services** association.



The Council works to advance member policy priorities and empower the energy workforce of the future.

Combining into one organization broadens our reach by increasing geographic representation.

- **Connect, educate, support and advocate** for energy technology companies and the workforce of today and the future.

Stronger Together

450+

Companies with a united mission to show how integral our services are to **answering global energy demands** while **achieving environmental goals**

600,000+

Employees in a critical sector that **impacts decision-making by policymakers** through direct meetings, townhalls, Washington Fly-Ins, alliances and more

16 Domestic chapters

2 International chapters

13 Committees

4 Certification programs

$4 Million+ Scholarships

Strategic Priorities

Industry leaders analyzed industry trends and created a three-year roadmap

ESG

The Council takes the lead in demonstrating positive contributions made by Member Companies through collaboration, training and education.

ENERGY TRANSITION

We need an “all of the above” energy strategy that leverages all of our energy resources. We shouldn’t exclude one energy source because of ideology or partisan considerations.

GOVERNMENT AFFAIRS

The Council is a resource for Members to learn about and engage in federal, state and local policy issues specific to the energy services sector, engaging across partisan lines.

Energy Transition is Not an Either/Or Proposition

- Energy transition is **not a transition away from oil and gas**, it is the entire energy ecosystem working together, including oil and gas

- **Multiple transitions** based on unique aspects of countries and regions

TRENDS


Digitalization


Remote Technology


Automation

KEY DRIVER: MARKETS


Reduce Climate Impact


Improve Environmental Performance


Economic & Environmental Equity

Energy Services Will Lead the Transition

Renewables - Hydrocarbons - Hydrogen - Nuclear - Biofuels

Entire ecosystem working together to produce the cleanest, most reliable and affordable energy.

Transition must be smart and realistic, with a focus on improving lives. Solutions also must be practical and scale to meet the needs.

Hydrocarbons will be part of the fuel mix for the foreseeable future.

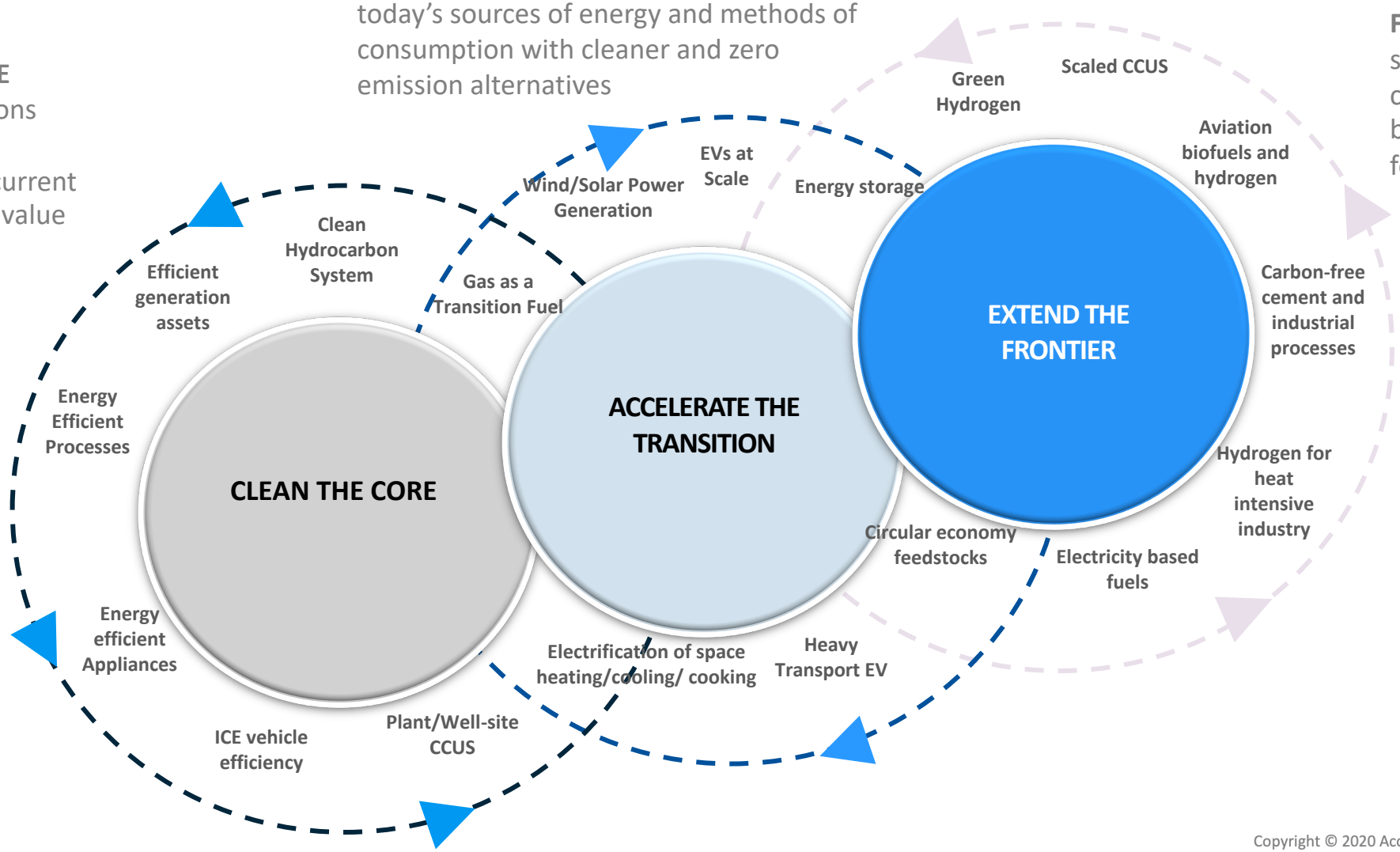
Energy services will lead the energy transition because the sector knows how to scale projects and deliver technology to meet growing demand.

Three types of action will set the pace and success

CLEAN THE CORE minimize emissions and maximize efficiency from current infrastructure & value chains

ACCELERATE THE TRANSITION replace today's sources of energy and methods of consumption with cleaner and zero emission alternatives

EXTENDING THE FRONTIER scales solutions commercializes beyond what is feasible today



ENERGY TRANSITION & TECHNOLOGY COMMITTEE

CHAIR: Benoit Chambert-Loir, Development & Innovation Global Key Account Manager, Vallourec
ADVISORY BOARD LIASON: Sanjiv Shah, Managing Director, Investment Banking, Simmons Energy, a Division of Piper Sandler

2020-2021 ACCOMPLISHMENTS

Committee Expansion

- Recruited technical and product line positions to committee

Best Practice Sharing

Highlighting Member Companies:

- Increased technical efficiencies
- Recycling efforts
- Collaboration with renewable technologies
- Carbon reporting

2021-2022 GOALS

Build Sector Knowledge and Maturity

- Increasing understanding of Scope 1, 2 & 3 emissions
- Dialogues with customers on supply chain expectations

Lead Sector in Energy Transition Through Dialogues and Best Practice Sharing

Highlight Member Company Successes and Role in Carbon Emissions to Wider Audience

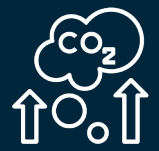
PARTICIPATING COMPANIES

Baker Hughes, CAT, NOV, OCEANEERING, oerlikon metco, PIPER SANDLER, Schlumberger, SOLARIS OILFIELD INFRASTRUCTURE, TechnipFMC, vallourec

Technology is Changing the Future of Energy Services

- eFrac – Electric motors fueled buy natural gas improves environmental performance and cuts costs by 5-6%

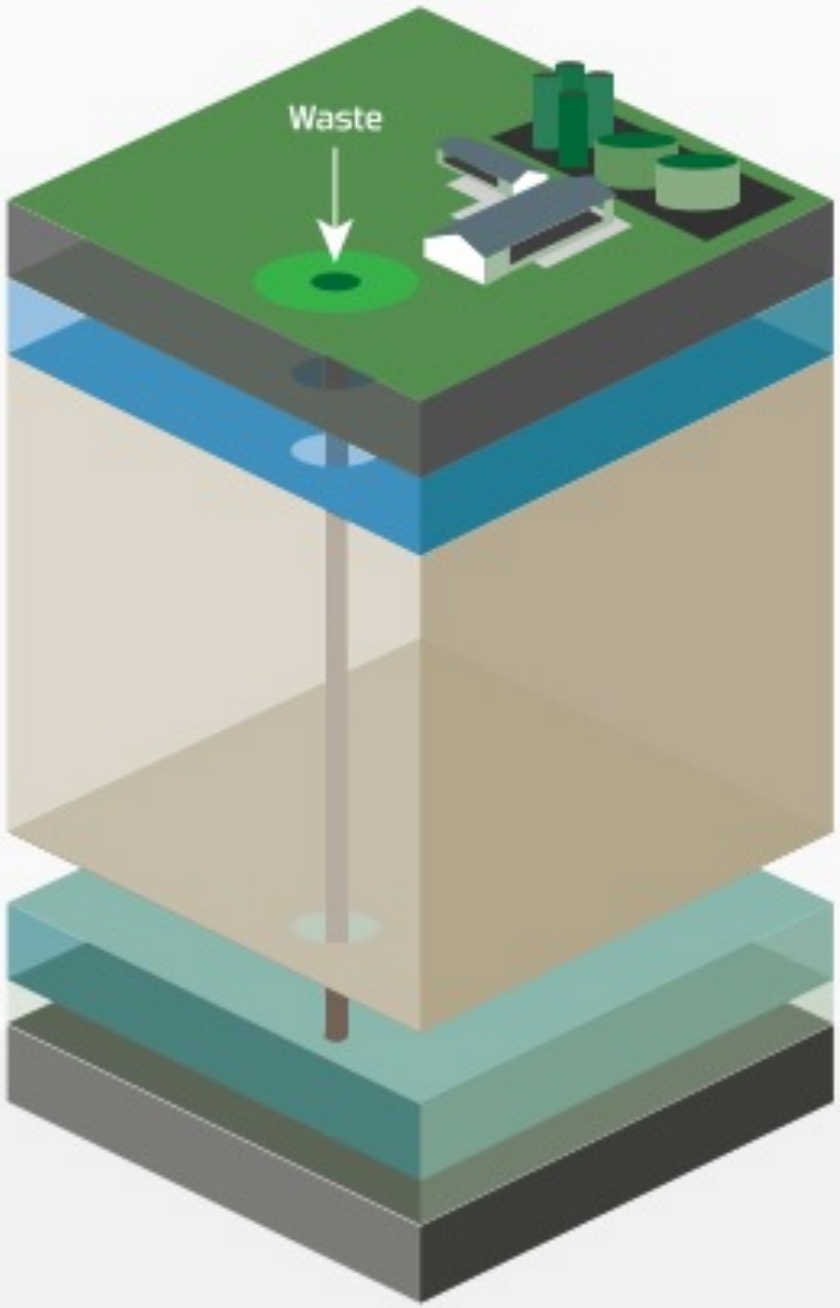
- Gas Turbines – Small, lightweight onsite power generation



- Carbon Capture, Utilization and Sequestration (CCUS) – Captures CO^2 to be stored or recycled as concrete, plastics or biofuel

- Artificial Intelligence – Used to analyze data more efficiently, accelerating decision-making, and boosting productivity

- Machine Learning - Models building operations, detects anomalies in refinery assets, predicts energy savings opportunities, and helps energy facility managers take action in near real time



CO_2 Injection

- Deep shale injection of CO_2-rich slurry waste streams
  - Non-hazardous liquids and slurry waste streams including drilling muds, tank bottoms, flowback, dirty water, and produced saltwater are injected into deep, secure geological strata thousands of feet below the earth's surface and usable groundwater.
  - Due to substantial injections of hydrocarbons, member companies have produced a negative carbon footprint of ~226,000 MT CO_2e during 2020.

Methane Leak Detection

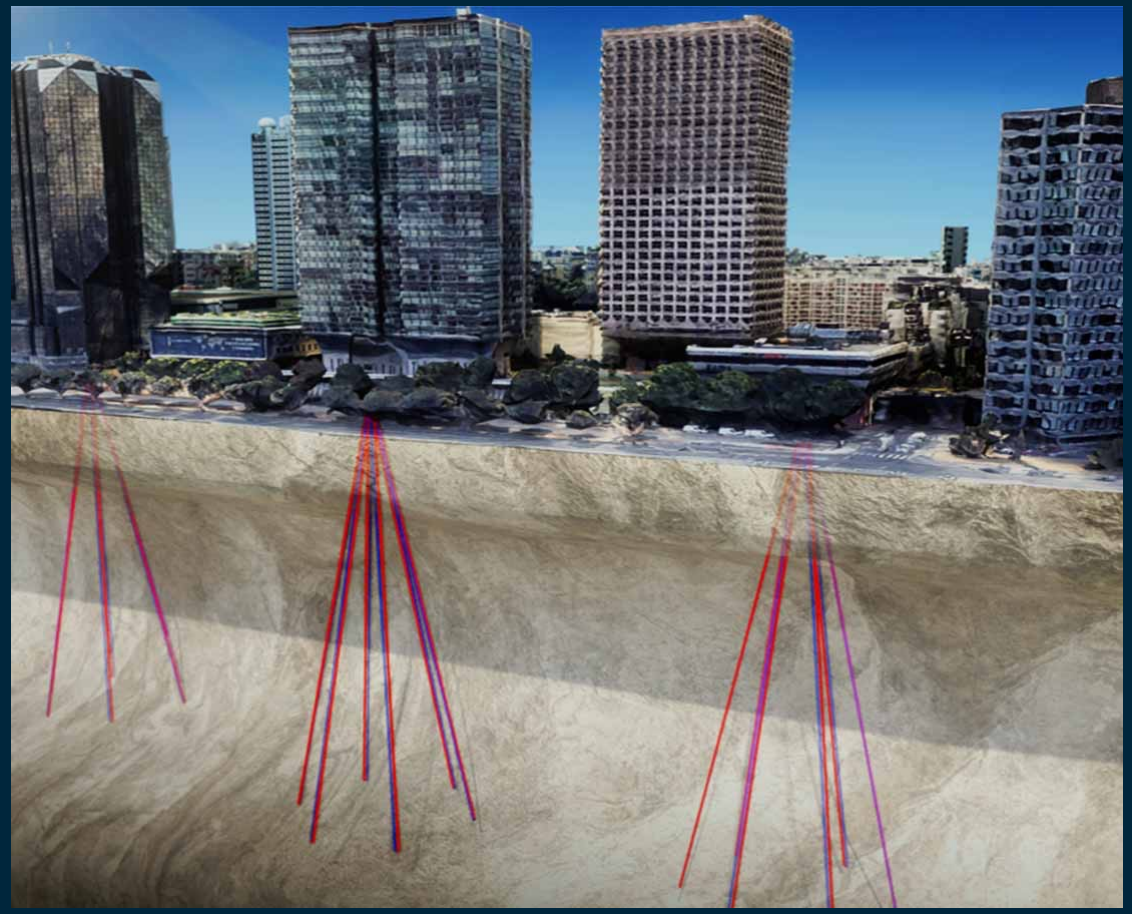
- Comprehensive Methane Monitoring
  - Quantitative Optimal Gas Imaging (qOGI) technology offers leak detection, quantification of the rate of the leak, and identification of the leak location in real-time so that operators can take immediate action and save costs
  - Two deployment methods for detecting methane leaks:
    - Fixed thermal-imaging cameras for continuous ground-based digital methane monitoring at plants and operation sites
    - Airplane and drone-based digital methane monitoring which allows operators to monitor hundreds of acres for leaks in real-time

Battery Storage Technology

- Member companies are progressing large-scale deployments of nickel-hydrogen batteries across selected global markets.
- The focus on expanding electrification is accelerating the need for large scale deployment of safe, cost effective, sustainable and reliable stationary energy storage solutions.
- There is a rapidly growing market for such solutions across utility-scale grid storage, off-grid commercial and industrial storage, and residential sectors.
- Efficient battery storage and battery discharge technology is essential for renewable energy markets to thrive.

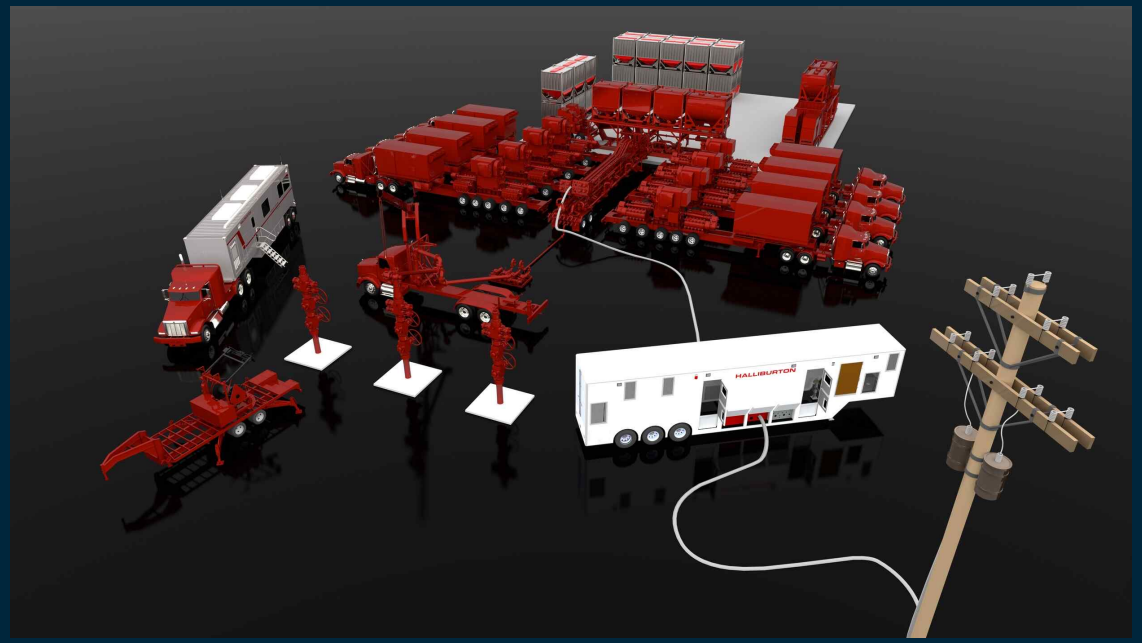
Geothermal Energy

- Tapping into Earth's Geothermal Energy to power cities
  - The Celsius Energy building and heating solution utilizes geoenergy, which is powered by the Earth. Essentially, the solution aims to plug buildings into the Earth's continuous and resilient energy resources to deliver heating and cooling.
  - So far, this first installation has resulted in a 90% reduction of CO_2 emissions, and a 40% reduction of operational costs.



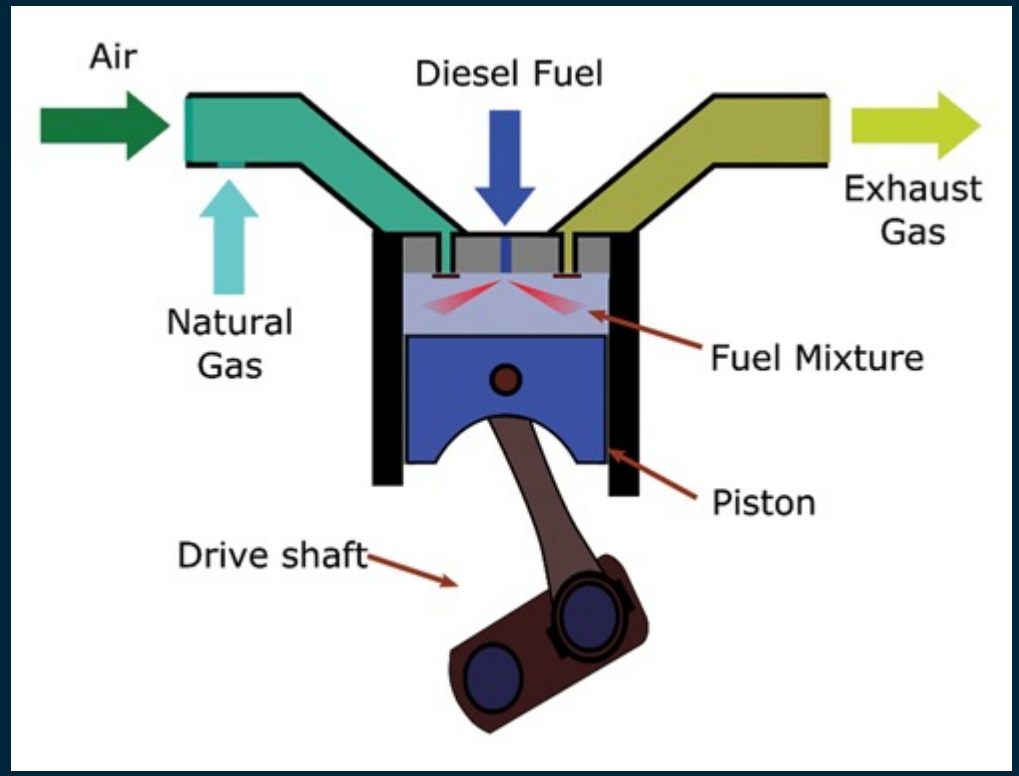
Total Fleet Electrification

- Global Fleet Electrification
  - The industry is moving away from conventional-fuel fleets and towards fully electric fleets powered by renewable energies.
  - A fully electric fleet can either burn natural gas that is gathered from the field or tap into the local electric grid to generate the electricity used to power its motors, eliminating the need to flare excess natural gas.
  - Member companies have cut CO_2e emissions up to 40%, which equates to about 2,200 metric tons/month per fleet.



Dynamic Gas Blending and “Dual Fuels”

- Dynamic Gas Blending
  - “Dual Fuel” fleets are hydraulic fracturing fleets with engines that are powered by a combination of diesel and natural gas.
  - The ability to lower diesel consumption by blending it with natural gas reduces the amount of diesel consumed and its corresponding greenhouse gas (GHG) emissions.
  - Member companies have displaced over 8 million gallons of diesel in 2020 and expect gallons of displaced diesel to increase throughout 2021.

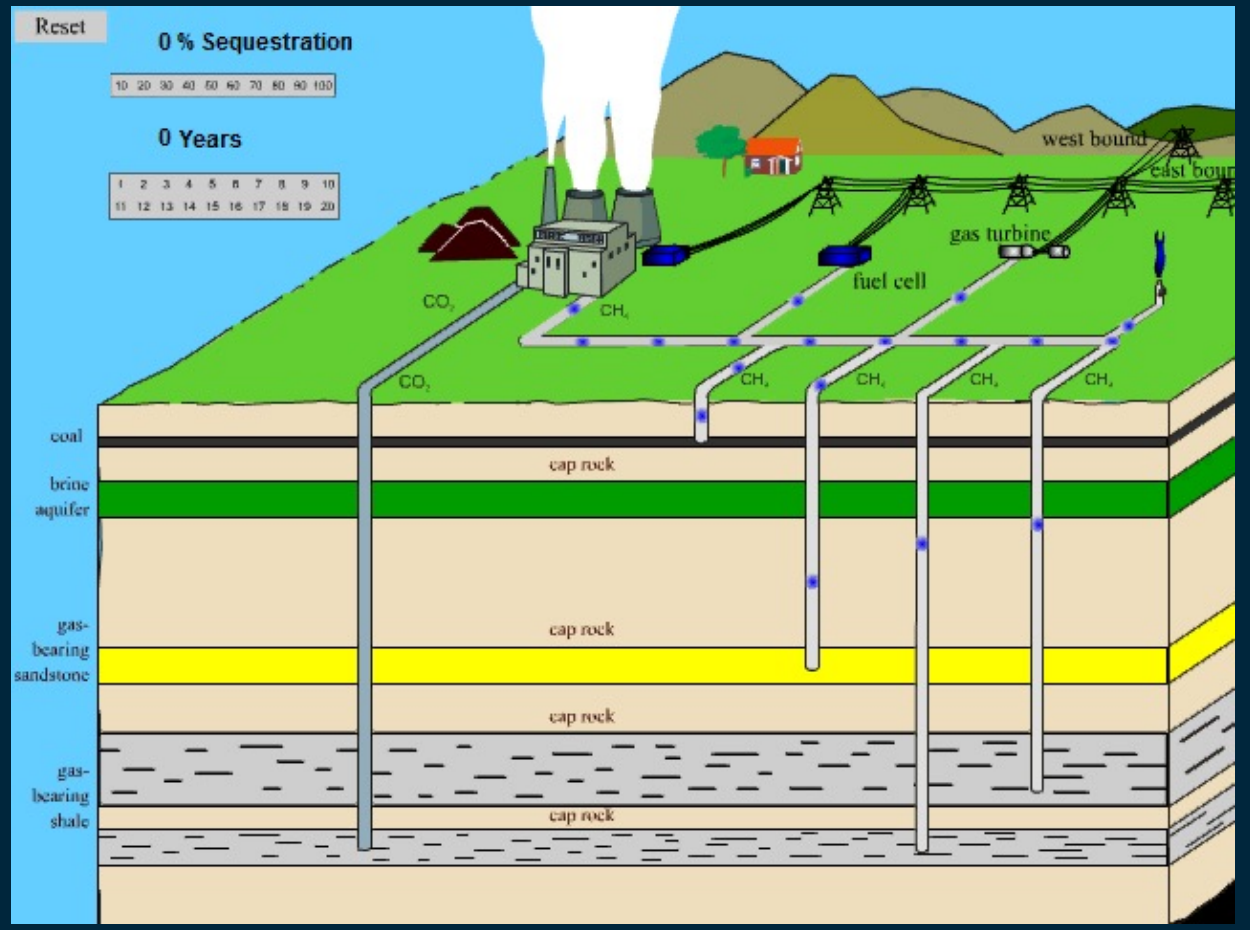


Complete System Automation

- Automation technology allows entire systems to be operated automatically using machine learning and remote sensors.
- Automation technology helps prevent leaks/spillage, contributes to less fuel consumption by reducing the need to bring equipment to the well site, and increases efficiencies across the entire job.
- The physical, on-site labor required to operate the automated system is minimalized, which reduces the risk of injury.

Carbon Sequestration

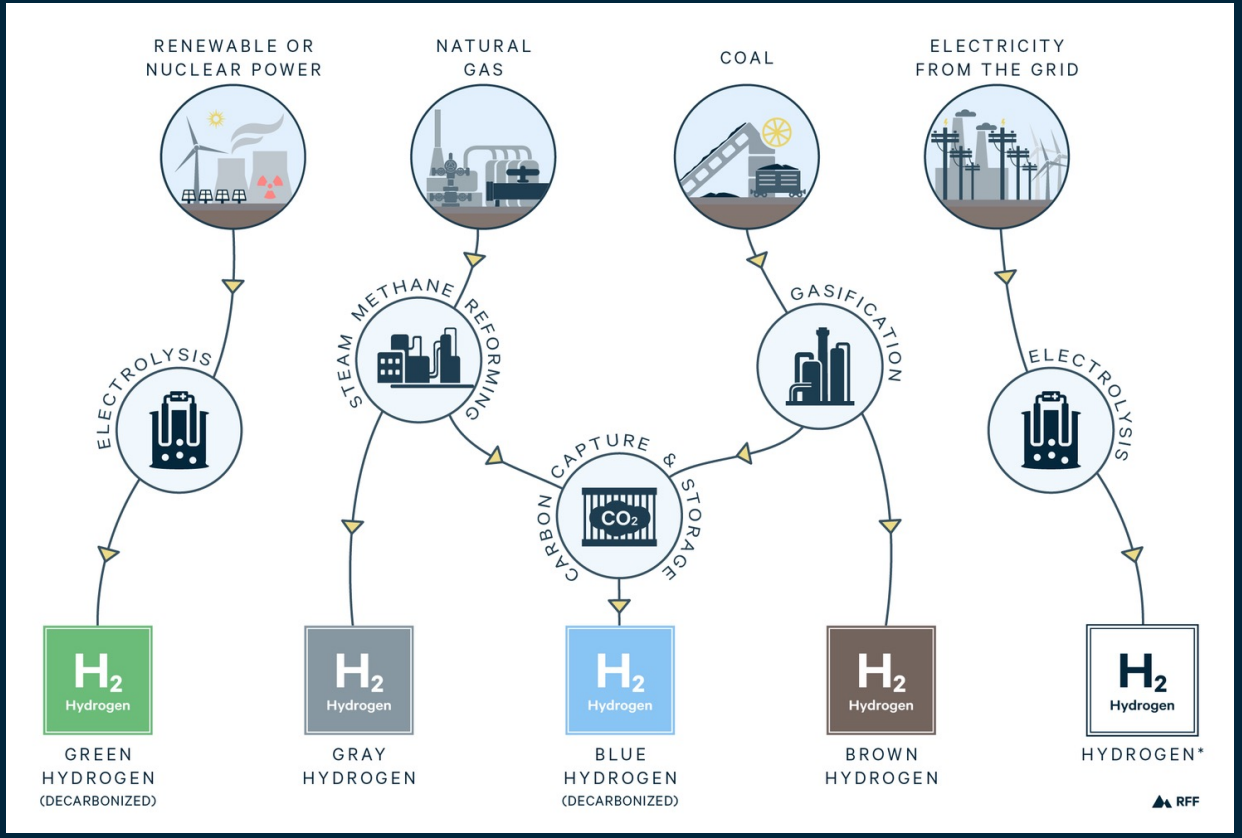
- Carbon Capture and Storage (CCS) of CO_2 in rock formations that can safely and securely retain large amounts of CO_2 over a long time period.
- Carbon Sequestration is being considered for onshore and offshore projects.
- Currently, most carbon sequestration projects are tied to Enhanced Oil Recovery (EOR) efforts.

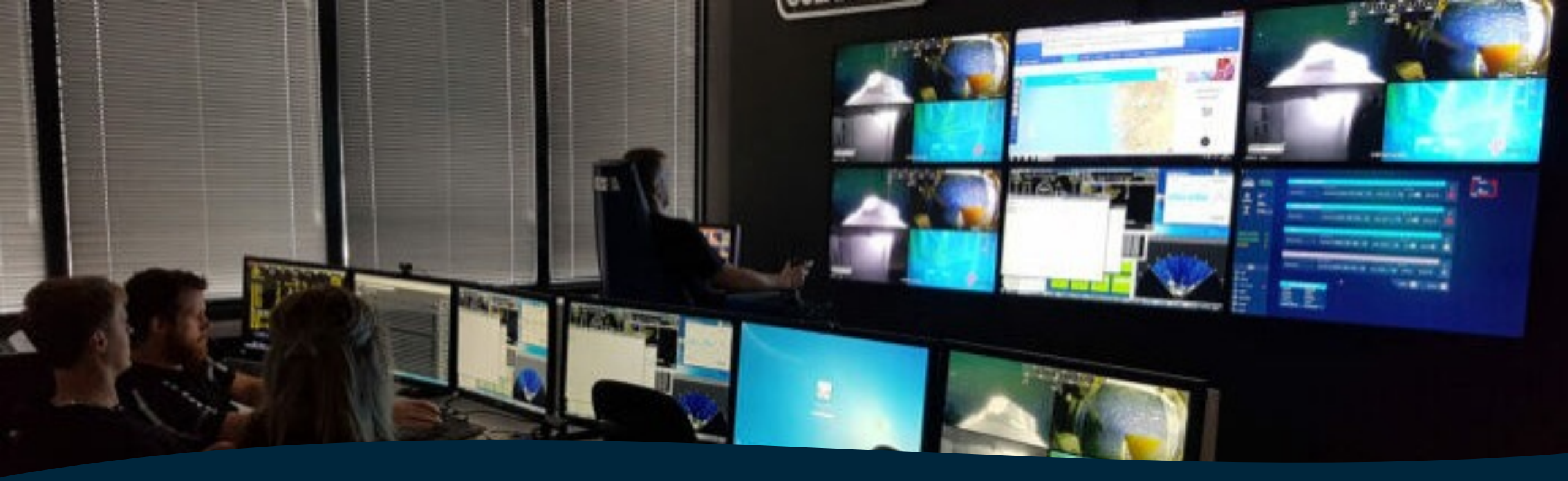


Layers shown: Coal, brine aquifer, gas bearing sandstone, gas bearing shale

Hydrogen Technologies

- Multiple member companies have developed clean, efficient, and carbon net-zero processes for hydrogen fuel generation.
- Hydrogen fuel-cell technology is a rapidly growing global energy market.





Offshore Remote Operations

- Remote Operated Vessels (ROV)
  - ROV deployments do not require dedicated vessels to be on standby during operations.
  - As a result, estimates suggest that a typical Inspection, Maintenance, and Repair (IMR) campaign in the North Sea could see up to 33 MT per day of CO_2 saved by eliminating vessel usage during subsea operations with the ROVs.

Educating Policymakers and the Public

NECESSITY OF OIL & GAS

- Energy demand to **increase 25%** over next 20 years
- Renewables **supply chain relies on oil and gas** for transportation, shipping, electricity, materials and manufacturing
- Oil and gas **enables** wealthy nations and companies to **invest in alternative energy sources**
- Since 2005, the switch from coal to natural gas for electricity generation has been the number one driver of decreasing carbon in the U.S. **saving CO2 emissions** by more than **2.8 billion metric tons**

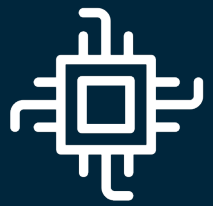
PRACTICALITY

- Existing infrastructure can be **adapted**

NATIONAL SECURITY

- Shutting down U.S. oil and gas production strengthens China and Russia
- U.S. would be dependent on other nations for energy needs
- China controls majority of earth's minerals essential for batteries, turbines and solar panels

Workforce of the Future - Attract, Retain and Prepare



Inclusion, Diversity and Racial Equality

- Gender Diversity Study
- Energy Workforce Diversity Toolkit
- Racial Equality Task Force
- Working Groups/Action Plan

Workforce Development

- Council Certified Executive Program
- Executive Leadership
- Inclusion & Diversity
- ESG Knowledge Sharing Program

Industry Reputation

- IPAA/Energy Workforce Energy Education Center
- NSBE Summer SEEK Program
- Rice University Fellowship
- FSO Training Program

Inclusion & Diversity

in the Energy Technology and Services Sector

Study Overview

The 2018 Study:

- Established a baseline on gender diversity
- Led to actions for progress:
  - Diversity Toolkit
  - I&D Business Champion Program
- Set a goal of reaching **20% women by 2020** in the sector workforce

2021 Study:

Follow-up on progress on gender diversity

Build a sector baseline on ethnic minority and racial diversity

Identify key gaps to close for women and ethnic minorities

25 companies participated, representing 249,175 employees

We’re Looking Forward

The future for oil and gas is optimistic with commercial opportunities in the energy transition

Form alliances with key stakeholders

The industry must earn respect through communications, advocacy and collaboration

Innovating, training and advocating on behalf of the sector

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