2020 breaks ice on climate and energy policy

1. Overview of ClearPath
2. The clean energy innovation imperative
3. Biggest DC policy win is major innovation funding increase in FY20
4. New momentum: House Republicans launch climate package
5. Prospects for largest in decade energy bill in 2020
6. New bipartisan cooperation: Largest ever clean incentive proposal
Jeremy Harrell
Managing Director, Policy

- Head of Policy Development at ClearPath
- Chairman, U.S. Nuclear Industry Council (USNIC)
- Legislative Chair, Geothermal Resource Council (GRC)
- Fmr. Republican Congressional Energy and Tax Policy Advisor

Mission
Advance conservative policies that accelerate clean energy innovation

Vision
Deep global decarbonization by 2050 through an innovation and deployment agenda -- driving global uptake of clean technology
Climate policy challenge

Legislatively realistic

Politically sustainable

Solves global emissions problem
Global challenge: Clean energy and fossils racing neck and neck

Despite absolute clean energy growth, its relative share of the world’s energy mix remains static.

Source: BP Statistical Review of World Energy
Start with the end in mind

Total U.S. Electricity Generation by Source
- 34% Natural Gas
- 19% Nuclear
- 28% Coal
- 7% Hydro
- 11% Other Renewables
- 1% Other

U.S. Emissions by Economic Sector
- 36% Transportation
- 33% Power
- 19% Industry
- 6% Residential
- 5% Commercial

Global Emissions by Country
- 30% China
- 15% United States
- 7% India
- 9% EU-28
- 4% Japan
- 5% Russia
- 30% Other

Source: US EPA, Emissions & Generation Resource Integrated Database
Source: US EPA, Greenhouse Gas Inventory Data Explorer
Developing countries still choosing high emitting technologies

China Belt and Road initiative investing heavily in coal fired plants.

In Pakistan, for example, coal new build heavily outweighs zero emissions sources with Chinese support.

Source: Downs 2019, Columbia Center on Global Energy Policy
Utility decarbonization commitments

- **Exelon**: 15% emission reduction 2018-2022

- **DTE Energy**: Net zero carbon emissions in electric company by 2050*
  - 60% CO2 reduced by ‘30
  - 80% CO2 reduced by ‘50

- **AEP**: Net zero emissions by 2050
  - 50% CO2 reduced by 2030, “low to no” carbon by 2050*

- **Dominion Energy**: Net zero emissions by 2050

- **National Grid**: 45% carbon reduction by 2020, 80% carbon reduction by 2050*

- **Xcel Energy**: 80% CO2 reduced by ‘30, 100% Clean by 2050*

- **Duke Energy**: Net zero carbon emissions by 2050*

- **Southern Company**: 50% CO2 reduced by 2030, “low to no” carbon by 2050*

* Indicates new technology is required to achieve commitments
U.S. Policy should push clean technology up the global “S-curve”

- Lab scale
- Early demos
- Policy-enabled deployment makes cheap
- Mass adoption in developed markets
- Low cost enables global deployment
We know the innovation policy playbook that produced breakthroughs - example of cheap unconventional gas

- Approximately $500M applied R&D in public private partnership:
  - Horizontal drilling
  - Hydraulic fracturing
  - 3D seismic imaging
  - Diamond headed drill bits
  - Combined cycle natural gas turbines

- $6B to $12B in tax incentives between 1985-91

- $100M+ investments by Gas Research Institute:
  - Commercialization & cost shares (e.g. Mitchell)

Massive scale-up of cheap, cleaner gas power

Source: The Breakthrough Institute, The American Energy Innovation Council, MIT
Congress heavily in clean in 2018/19

<table>
<thead>
<tr>
<th>Program</th>
<th>Clean capital impact (max)</th>
</tr>
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<tbody>
<tr>
<td>45Q CCS Incentive</td>
<td>~ $50,000 M</td>
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<tr>
<td>45J Nuclear Incentive</td>
<td>$6,000 M</td>
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<tr>
<td>FY’19 Clean RD&amp;D</td>
<td>$5,810 M</td>
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<tr>
<td>FY’18 Clean RD&amp;D</td>
<td>$5,550 M</td>
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<tr>
<td>NEICA Nuclear Innovation</td>
<td>~ $3,000 M</td>
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<tr>
<td>NEIMA Reg Development</td>
<td>~ $140 M</td>
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<tr>
<td>Total</td>
<td>~ $70,000 M</td>
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</tbody>
</table>
Key technologies and policy areas

- Nuclear
- Energy Storage
- Carbon Capture
- Geothermal
- Hydropower

- Federal R&D (basic and applied)
- Demonstration Programs
- Deployment Incentives
- “Ecosystem” eg. Regulatory Reform
FY20 added ~$800M, tracking to 2x goal over 10 years
Recent Administrative Clean Energy Goals Advanced

- **U.S. Development Finance Corporation**
  - Increased authorities to export American clean technologies abroad
  - Eliminate OPIC/DFC's restriction on advanced nuclear investments

- **45Q Final Rule-Making**
  - Two years after enactment, implementation guidance advances
  - Momentum to extend and enhance the 45Q Tax Credit
  - RHG projects 5 year extension could unlock 144 million metric tons of capture capacity through 2035.

- **DOE Crosscuts and Expansions**
  - Energy Storage Grand Challenge
  - Integrated Energy System pilots
  - Energy-Water Nexus Crosscut
  - Industrial carbon capture expansion
Broad industry, labor, NGO support for clean innovation

“We are writing to urge you to place legislation addressing energy and climate technology innovation on the Senate’s fall legislative calendar”
Senate bill update: current state of play

Prospects for passing were initially strong

- 83-0 vote to proceed to the bill
- McConnell supportive

Failed cloture vote on Senate floor

- 16 amendments adopted pre-cloture
- Some R opposition garnered by Shaheen-Portman building codes provision
- Politics of Kigali (HFCs) Amdt. prompted Schumer-Senate Dem opposition

Hope remains for passage this year

- McConnell allowed reconsideration
- HFC compromise near
- House RD&D package advancing in late September

Hope remains for passage this year
Moonshot demonstration program in AEIA 2020

2020
2025
2030
2035

NELA

LEADING

EFFECT

BEST

AGILE

DOD SCO Prototype
2025 Demos
NuScale PPA
Versatile Test Reactor

Demos

Demos

Demos

Demos
# High priority legislative initiatives overview

<table>
<thead>
<tr>
<th><strong>Policy Initiatives</strong></th>
<th><strong>Overview</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Sector Innovation Credit (H.R.5523)</td>
<td>Creates a new “technology neutral” tax incentive that facilitates investment in innovative new dispatchable clean energy technologies.</td>
</tr>
<tr>
<td>Nuclear Energy Leadership Act (S.903/H.R.3306)</td>
<td>Establishes a federal RD&amp;D goal to demonstrate alongside private industry 2 new advanced reactor concepts by 2025 and 2-5 more by 2035.</td>
</tr>
<tr>
<td>Enhancing Fossil Fuel Energy Carbon Technology Act (S.1201) &amp; the Fossil Energy Research and Development Act (H.R.3607)</td>
<td>Modernizes federal fossil energy RD&amp;D to accelerate the commercialization of new coal and natural gas carbon capture projects over the next decade.</td>
</tr>
<tr>
<td>Better Energy Storage Technologies Act (H.R.2896/S.1602)</td>
<td>Accelerates the RD&amp;D of long-duration storage technologies and aims to demonstrates 3-5 grid scale technologies by 2025.</td>
</tr>
<tr>
<td>Advanced Geothermal Innovation Leadership Act (S.2657) &amp; Advanced Geothermal R&amp;D Act (H.R.5374)</td>
<td>Reorients research and development of both existing and enhanced geothermal systems, bolsters public private partnerships, and improves permitting.</td>
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## 116th Congress Innovation Legislation

<table>
<thead>
<tr>
<th><strong>Carbon Capture, Utilization, and Storage</strong></th>
<th><strong>Advanced Nuclear</strong></th>
<th><strong>Energy Storage</strong></th>
<th><strong>Advanced Renewables</strong></th>
<th><strong>Innovation</strong></th>
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<tbody>
<tr>
<td>House Introduced</td>
<td>House Committee</td>
<td>Senate Introduced</td>
<td>Senate Committee</td>
<td>Passed by House or Senate</td>
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<tr>
<td>USE It</td>
<td>Fossil Energy RD&amp;D Act</td>
<td>Carbon Capture Modernization Act</td>
<td>EFFECT Act</td>
<td>USE It Act</td>
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<tr>
<td>Enhanced 45Q CCUS Tax Credit Act</td>
<td>LEADING Act</td>
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<td>Nuclear Energy Leadership Act</td>
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<td><strong>Advanced Renewables</strong></td>
<td>Enhancing Geothermal Production on Federal Lands Act</td>
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<td></td>
<td>Solar Energy R&amp;D Act</td>
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<td></td>
<td>ARPA-E Reauthorization</td>
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Clean Industrial Technology Act (S.2300/H.R.3978)

Establishes new crosscutting industrial emission reduction technology program focused on...

- Low carbon materials
- Industrial production processes
- High performance computing
- Liquid and gaseous fuel emission reductions

Rep. Sean Casten (D-IL)
Rep. David McKinley (R-WV)
Sen. Sheldon Whitehouse (D-RI)
Sen. Shelly Moore Capito (R-WV)
Quotes

- “Republicans’ pro-growth, consumer-first policies are ones that can become law and have an actual impact on our future.” - Leader McCarthy

- “commonsense solutions to combating our changing climate.” - Rep. Gosar

1st Leg - Carbon Capture

1. Permanent 45Q tax credit for carbon capture and sequestration
2. Carbon utilization research hub for R&D and deployment
3. Direct Air Capture and CCS deployment through permit reform and incentives
4. Trillion Trees Act

Additional Legs

- **Clean Energy:** Research and Development of clean energy technologies
- **Conservation:** Initiatives to decrease plastic waste and other conservation action
Bipartisan members introduce cleantech tax policy

**Republicans**
- Reed
- LaHood
- Schweikert
- Amodei
- McHenry

**Democrats**
- Panetta
- Suozzi
- Gottheimer
- Sewell

**Supportive Organizations (Partial)**
- Southern Company
- American Public Power Association
- Bipartisan Policy Center
- ITIF

**Eligible Technologies (Partial)**
- NET Power
- Panasonic
- inventys
- MTR
- NUSCALE
- NRECA
- NECA