Governors’ Advisors
Energy Policy Institute
August 20 - 25, 2020
Day 1

National Governors Association
Center for Best Practices
Virtual Meeting Housekeeping

For Technical Support:

Please chat or contact Tonya Smith (tsmith@nga.org) if you have any technical questions or call/text at (202) 834-0022.
Today’s Virtual Meeting: Zoom Controls

If you don’t see the menu bar, move your mouse slightly and the bar will appear.

The Zoom menu bar appears at the bottom of the Zoom window once the meeting begins.
Step 1: Mute/Unmute Your Audio
Step 1: Mute/Unmute Your Audio
Step 2: Start/Stop Video Share
Step 2: Start/Stop Video Share
Step 3: View List of Participants
Step 4: Raise Your Hand
Step 5: Chat your questions
Welcome & Opening Remarks

Dan Lauf, Program Director, National Governors Association

Jessica Rackley, Program Director, National Governors Association
What is NGA?

Founded in 1908, the National Governors Association is the nonpartisan organization of the nation’s 55 governors. Through NGA, governors share best practices, address issues of national and state interest and share innovative solutions that improve state government and support the principles of federalism.
Provide governors state-based energy, environment and infrastructure solutions that enhance economic development, mobility, sustainability, reliability, resiliency, health and safety.
NGA’s Energy Team

Dan Lauf
Emma Cimino
Matthew Rogotzke
Jessica Rackley
Alyse Taylor-Anyikire
Timothy Schoonhoven
NGA Recent Energy Priority Areas

- COVID-19 Response and Recovery Efforts, [https://www.nga.org/coronavirus/](https://www.nga.org/coronavirus/)

- Clean Energy & Grid Modernization Strategies

- State Energy Resilience Planning and Cybersecurity Coordination

- Transportation Electrification

- Broadband Expansion

- **State Resource Center on Energy Security**
COVID-19 Energy Resources

Written Guidance:

- NGA Guidance on Supporting the Energy Sector during COVID-19
- NGA Guidance on State Moratoriums on Utility Disconnections and Related Actions During the COVID-19 Pandemic
- Governors’ COVID-19 Resource Library
  - Memos on: Testing, PPE, Concurrent Disasters, Reopening, Recovery, Cybersecurity

Webinar:

- COVID-19 Impacts to Energy Security

Online Resources:

- www.nga.org/coronavirus
- State Resource Center on Energy Security
Upcoming Events and Technical Assistance

- Annual Governors’ Advisors Energy Policy Institute
- Offshore Wind Summit
- Energy/Water Nexus Learning Lab
- Electric Vehicle Grid Integration Workshop
- National Clean Energy Workshop

Upcoming Publications

- Broadband Expansion
- Electric Vehicle Grid Integration
- Clean Energy Deployment
- Cybersecurity Governance and Information Sharing
- State Resilience Assessment and Planning Tool
## Energy Policy Institute Agenda

### Day 1 - Thursday
- **1:45 - 2:15 pm** (ET) Welcome and NGA Updates
- **2:15 - 3:00 pm** States Speak: Roundtable on Key Energy Priorities
- **3:00 - 3:45 pm** Energy Trends and Future Outlook
- **3:45 - 4:00 pm** Day 1 Wrap Up
- **4:00 - 4:30** Virtual Networking Happy Hour

### Day 2 - Friday
- **1:30 - 1:45 pm** (ET) Day 2 Opening
- **1:45 - 2:15 pm** Incorporating Equity in Energy Policy
- **2:15 - 3:00 pm** Energy Goals and Budget Holes
- **3:00 - 3:50 pm** State Strategies to Leverage Federal Dollars
- **3:50 - 4:00 pm** Day 2 Wrap Up

### Day 3 - Monday
- **1:30 - 1:45 pm** (ET) Day 3 Opening
- **1:45 - 2:15 pm** The Future of U.S. Carbon Pricing
- **2:15 - 3:00 pm** The Future of the Energy Workforce
- **3:00 - 3:45 pm** Utility Disconnection Moratoriums
- **3:45 - 4:00 pm** Day 3 Wrap Up

### Day 4 - Tuesday
- **1:30 - 1:45 pm** (ET) Day 4 Opening
- **1:45 - 2:15 pm** Energy System Planning for a Modern Electric Grid
- **2:15 - 3:00 pm** Improving Energy Cybersecurity in Your State
- **3:00 - 3:45 pm** The How and Why of Regional Agreements
- **3:45 - 4:15** Conference Wrap Up
Interactive Polling & Testing Zoom
Features

Source: The New Yorker
States Speak: Introductions & Key Energy Priorities

Jessica Rackley, Program Director, National Governors Association
State Introductions

• For state attendees, in 1 minute or less, please introduce yourself, and briefly describe your governor’s energy policy priorities.

• Guidance: Please remember to unmute yourself. I’ll ask for introductions in alphabetical order by state based on the participant’s list.
What’s Happening in Energy: Trends and Future Outlooks

Daniel Raimi, Resources for the Future
Energy 2020
Recent trends and outlook

Daniel Raimi
Senior Research Associate, Resources for the Future
Lecturer, UMich Ford School of Public Policy
raimi@rff.org

August 20, 2020
Presentation for the National Governor’s Association
Governors’ Advisors Energy Policy Institute
Agenda

• COVID-19, global energy, and US energy jobs
• Oil and gas markets and employment
• Coal markets and employment
• Renewables markets and employment
• Electricity markets and employment
• Greenhouse gas emissions
• Looking ahead: federal policy outlook and key uncertainties
COVID-19, global energy, and US energy jobs
The short-term effects of COVID-19 on the energy sector are unprecedented in modern times

Percent change in global annual energy demand, 1900-2020

Figure source: International Energy Agency, 2020

COVID-19 -6%
Fossil energy consumption and CO$_2$ emissions will fall dramatically this year

Estimated change in global GDP and energy consumption, 2019 - 2020

Data source: International Energy Agency, 2020
US energy jobs: an overview

2019 US energy jobs by type (millions)

Data source: Energy Futures Initiative / National Association of State Energy Officials
Oil and gas markets and employment
The US oil and gas industry has experienced a “revolution” in the last 10-15 years

• Improvements in horizontal drilling and hydraulic fracturing (“fracking”) have led to unprecedented growth in natural gas and oil output

• The US had become the world’s largest producer of natural gas and oil

• Major impacts for producing regions, US (and global) consumers, and the environment

• Shameless book plug:
Benchmark oil and gas prices have fallen to decadal lows

This has translated into rapid and deep job losses in oil and gas production.
What’s next for oil and gas

• The global outlook for oil is highly uncertain, and is dependent on two key factors:
  • Short term: The pace and scale of *global* economic recovery
  • Long term: The shape of *global* efforts to address climate change

• The outlook for natural gas is less dependent on global factors
  • Short term: The pace and scale of *domestic* economic recovery
  • Short term: The winter weather
  • Long term: The shape of *domestic* efforts to address climate change
Coal markets and employment
US coal production has been falling, and COVID has accelerated the decline.

Data source: US EIA, 2020
Coal mining employment is at its lowest level since the 1800s

The outlook for coal is bleak in the US

• Utilities continue to retire coal-fired power plants
• This is driven by several factors
  • Low-cost competition from natural gas and renewables
  • State government commitments to reduce emissions
  • Utility commitments to reduce emissions
Renewables markets and employment
Renewables have grown dramatically in recent years, driven by cost declines

Levelized Cost of Electricity ($/MWh)

Data source: Lazard 2019

Energy source | Change, 2009-2019
--- | ---
Solar PV | -90%
Wind | -70%
Natural gas | +20%
Nuclear | +26%
Coal | -2%
As a result, renewable power has surged across the US

Net electricity generation (GWh)

<table>
<thead>
<tr>
<th>Energy source</th>
<th>Share of power mix, 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro</td>
<td>7%</td>
</tr>
<tr>
<td>Biomass</td>
<td>1%</td>
</tr>
<tr>
<td>Wind</td>
<td>7%</td>
</tr>
<tr>
<td>Solar</td>
<td>3%</td>
</tr>
</tbody>
</table>

Data source: EIA
Renewable energy jobs have also grown, with major upside potential despite COVID impacts

• Recent estimates show that renewable power production has lost 82,000 jobs in the last 5 months
• Jobs in renewable energy are projected to grow in the years and decades ahead
• The speed of that growth will depend on technological change and public policies around climate change
• In some—but not all—cases, these jobs are of similar quality to fossil energy jobs
Electric power markets and employment
Electricity consumption has dropped for the commercial and industrial sectors in 2020.

Data source: EIA
Coal has been hit particularly hard by the COVID downturn

Net electricity generation, GWh

Data source: EIA
Greenhouse gas emissions
CO₂ emissions have fallen to their early-1990s levels, driven by power sector declines.
Major changes in public policies will be needed to reduce emissions towards long-term goals

US CO₂ emissions projections

Data source: International Energy Agency
Federal policy outlook and key uncertainties
There are big questions about what comes next

• The pace and scale of the economic recovery will dictate the fortunes of the energy sector in the years ahead

• Government investments in “green” stimulus could have an effect on the future energy mix and greenhouse gas emissions
  • But these effects are likely to be modest, at least in the short term

• Behavioral responses will also affect the energy sector’s recovery
  • For example, will public transit use decline long-term?
  • If so, energy demand and emissions would increase

• Businesses may prioritize resilience over efficiency
  • This could also increase energy use and emissions
The 2020 election will be very consequential for energy and climate policy

- There are major policy differences between President Trump and Vice President Biden on energy and the environment
  - Clean Power Plan
  - Paris Agreement
  - Oil and gas methane emissions
  - And much more...

- Different policy approaches will have major implications for states
  - Effects for fossil energy workers and communities
  - Effects for renewable and energy efficiency workers
  - And much more...
Thank you very much!

Daniel Raimi
Senior Research Associate, Resources for the Future
Lecturer, UMich Ford School of Public Policy
raimi@rff.org

- RFF: [www.rff.org](http://www.rff.org)
- Follow us on Twitter: [@rff](https://twitter.com/rff); [@danielraimi](https://twitter.com/danielraimi)
Day 1 Recap of Key Ideas and Insights

1. What did you hear today that resonated?
2. What remaining questions do you have?
3. How can NGA provide assistance on these topics?
Virtual Happy (Half) Hour and Networking
What new hobbies have you picked up or talents have you discovered during quarantine?
Remember Traveling?

What is the first place you’re planning on visiting once travel becomes an option again?
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Welcome & Day 1 Recap

Jessica Rackley, Program Director, National Governors Association
NGA’s Energy Team

Emma Cimino
Senior Policy Analyst

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NGA’s Energy Team

Matt Rogotzke
Policy Analyst

Timothy Schoonhoven
Policy Analyst

Alyse Taylor-Anyikire
Senior Policy Analyst
Upcoming Opportunity: Electric Vehicle Grid Integration

• NGA will be hosting a virtual national workshop on EVs and grid integration issues on Sept. 16-18, 2020

• This workshop and a forthcoming policy paper will focus on state strategies to advance EV adoption and prepare the electric grid

• Topics covered during this workshop include:
  • Vehicle-grid-integration
  • Siting charging infrastructure
  • Regulatory considerations

• Please contact Matt, mrogotzke@nga.org
Opening Questions & Polling

Question (please use the hand raising or the chat feature via zoom)

• What is the most interesting new talent/skill/interest that you’ve gained during the pandemic? Or
• Where would you like to travel to/take your next vacation once you feel comfortable traveling again?
Incorporating Equity into Energy Policy

Speakers:
Carmelita Miller, Energy Equity Legal Counsel, Greenlining Institute
Chandra Farley, Just Energy Director, Partnership for Southern Equity

Moderated by:
Matt Rogotzke, Policy Analyst, National Governors Association
Trivia!

• Name one of the two states that do not have counties.
Answer:

- Alaska – called Boroughs
- Louisiana – called Parishes
Energy Goals and Budget Holes

Speakers:
Kathryn White, National Association of State Budget Officers
Commissioner Katie Dykes, Connecticut Department of Energy and Environmental Protection

Moderated by:
Emma Cimino, Senior Policy Analyst, National Governors Association
Energy Goals and Budget Holes: Current State Fiscal Conditions

National Governors Association
Energy Policy Institute (EPI)
Economic and Fiscal Outlook – Before & After COVID-19
Pre-COVID State Fiscal Environment (February 2020)

- Finished FY 2019 with revenue surpluses
- Rainy day funds at highest levels
- FY 2021 governors’ proposed budgets called for another year of modest spending growth
- States were focused on investing in key priorities
- Cautionary tale: preparing for the next downturn
- Long-term challenges: pensions and retiree health liabilities; infrastructure and transportation demands
All sources of revenue being impacted by COVID-19

Personal income, sales, corporate income, gaming, motor fuel

COVID-19 is impacting states in different ways and magnitudes

E.g. oil producing states; tourism; manufacturing

States are facing both increased spending demands and significant revenue declines

States took steps to balance fiscal 2020 and fiscal 2021 budgets, with some states still waiting to finalize full-year fiscal 2021 budgets

More mid-year actions are expected in fiscal 2021

Different than other recessions – public health emergency and sharp economic declines

What is the current fiscal environment for states?

(August 2020)
Revenue Outlook for States
Revenue Sources in the General Fund

Percentage

Fiscal 2019

Source: NASBO Fiscal Survey of States
Revenue declines during Great Recession (From fiscal 2008 to fiscal 2010)

<table>
<thead>
<tr>
<th>Tax Type</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total general fund revenue</td>
<td>-11.6%</td>
</tr>
<tr>
<td>Sales Tax</td>
<td>-6.8%</td>
</tr>
<tr>
<td>Personal Income Tax</td>
<td>-14.7%</td>
</tr>
<tr>
<td>Corporate Income Tax</td>
<td>-24.1%</td>
</tr>
<tr>
<td>Gaming Tax</td>
<td>-7.8%</td>
</tr>
<tr>
<td>All Other Revenue</td>
<td>-8.2%</td>
</tr>
</tbody>
</table>
Steep Declines During the Great Recession and a Sluggish Recovery Led Revenues to Lag Behind Real Fiscal 2008 Levels for a Decade

Fiscal 2020 figure is estimated (pre-COVID-19). Fiscal 2021 figure is based on governors’ recommended budgets (pre-COVID-19).
Percentages shown represent total annual general fund spending growth.
*Beginning with the Fall 2019 Fiscal Survey edition, Massachusetts now excludes federal reimbursements in its general fund spending and revenue totals. NASBO has adjusted prior 50-state totals from the Fiscal Survey to remove Massachusetts’ federal reimbursement amounts (as reported in the state’s Comprehensive Annual Financial Report, or CAFR) for comparison purposes.
42 States Saw Revenue Collections Meeting or Exceeding Fiscal 2020 Budget Projections Prior to the COVID-19 Crisis

A few states reporting collections below projections incorporated early impacts of COVID-19 on their tax collections.

*Fiscal 2020 figures were estimated based predominantly on pre-COVID-19 data. A few states that reported collections coming in lower than projections incorporated some early COVID-19 impacts on their tax collections.

Source: Spring 2020 Fiscal Survey of States
Impact of COVID-19 on State Revenues

States have been releasing updated revenue forecasts – many projecting multi-billion-dollar revenue declines over the next few years

» This is not expected to be just a one- or two-year problem for state revenues.

These projections are a moving target, surrounded by a lot of uncertainty

» Huge and uncertain variables in forecasts related to the virus, and when a treatment or vaccine will be available.

» Tax deadline shift also complicates the forecasting process.

The worst is likely still to come for state tax revenues, as the full economic impacts of the pandemic are felt

» Federal stimulus measures (checks to individuals, enhanced UI benefits, PPP, etc.) have been propping up the economy and state revenues, but only temporarily.

» Most states were seeing revenues coming in ahead of projections for fiscal 2020 before the pandemic, which provided some immediate cushion

» 2020 tax returns mostly based on 2019 economy, which was strong
How States Address Budget Shortfalls
Ways to address budget shortfalls

1. **Budget cuts**
   - Can include targeted cuts, across the board, personnel, etc.

2. **Rainy day funds and reserves**
   - Size of shortfalls greater than amount in rainy day funds
   - Try not to drain immediately

3. **Increased taxes**
   - Typically not first option and amount less than budget cuts

4. **Federal aid**
   - Was very helpful during Great Recession
   - This time: question of how flexible and how much
Strategies Used to Manage Budgets, Fiscal 2010

35 states
TARGETED CUTS

25 states
ACROSS THE BOARD CUTS

24 states
LAYOFFS

16 states
FURLoughs

9 states
SALARY REDUCTIONS

13 states
CUTS TO STATE EMPLOYEE BENEFITS

19 states
REDUCE LOCAL AID

14 states
REORGANIZE AGENCIES

13 states
RAINY DAY FUND

19 states
USER FEES
What are states doing so far to manage fiscal 2020 and 2021 budgets?

- Across the Board or Targeted Cuts
- Personnel Actions
- One-time Measures
- Rainy Day Fund Transfers

State Budget Actions in Response to COVID-19 Pandemic and Economic Crisis

NASBO Resource: State Budget Actions in Response to COVID-19 (Last Updated: July 1, 2020)
General Funds Expenditures
By Function

Estimated Fiscal 2019

Medicaid: 19.7%
K-12: 35.6%
Transportation: 0.9%
Corrections: 6.6%
All Other: 26.7%
Higher Education: 9.6%
Public Assistance: 0.9%

Source: NASBO State Expenditure Report
What makes this downturn different?

- States knew the economic consequences of closing down nonessential businesses, but the public health crisis left few good options.
- Ripple effect through all areas of government, from reduced transportation revenues to the closing of courts and effect on fee/fine/forfeiture revenues.
- Added expenses from addressing the COVID-19 pandemic.
  - Budgetary pressures from increased Medicaid caseloads, increased unemployment insurance filings.
- Many more pressing demands on governors in a very short timespan
Outlook for States
States will continue to respond to increased spending demands from the coronavirus

Adjusting revenue forecasts for fiscal 2021 while examining potential impact on fiscal 2022

Fiscal 2021 budgets will continue be revised

Budget instructions are being issued for fiscal 2022, with some calling for cuts up to 15 percent

Uncertainty around additional federal aid and how flexible
• States will still need to make cuts even with more aid

States will likely face impact of COVID-19 for many years to come

Outlook for states
FY 2021 and beyond
Energy Goals and Budget Holes

Commissioner Katie Dykes, Connecticut Department of Energy and Environmental Protection
Trivia!

• Which state lays claim to the most consecutive days above 120°F?
Answer:

California; 43 days in Death Valley, from July 6 through August 17, 1917.
State Strategies to Leverage Federal Dollars

Speakers:
Joseph Aldy, Harvard Kennedy School of Government
Jennifer DeCesaro, Senior Advisor, U.S. Department of Energy

Moderator:
Jessica Rackley, Program Director, National Governors Association
Lessons from the 2009 Recovery Act
Clean Energy Package

Joseph E. Aldy
Harvard Kennedy School

NGA Energy Policy Institute
August 21, 2020
Lessons from ARRA 2009

- Topline Design Considerations
- Impacts of Clean Energy Package
- Lessons from ARRA 2009
- State Government Considerations
Topline Design Considerations
Two Policy Objectives: 2009 ARRA

- **Economic Stimulus**
  - Timely: when output gap is large
  - Targeted: maximize bang for the buck
  - Temporary: ?

- **Clean Energy / Climate**
  - Target investments that reduce CO2 emissions
Instrument Choice

- Automatic policy tools
  - Tax credits
  - Formula-based grant programs
  - Move fast, targeting uncertain

- Discretionary policy tools
  - Loan guarantees, grant programs
  - Move slower, could tailor to marginal investment
  - Role of politics
Statutory Authorities

- Use of existing statutory authorities
  - Legislation focused on appropriations, not authorities
  - Existing programs well understood → move faster

- Create new authorities
  - In 2009, two major energy bills (2005, 2007) provided a number of new authorities to use
  - No major energy legislation since 2009!
ARRA Clean Energy Package Design
Array of Policy Tools to Spend $90+ Billion on Clean Energy

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Example</th>
<th>Score (billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost-shared grants</td>
<td>Smart grid grants</td>
<td>$3.4</td>
</tr>
<tr>
<td>State block grants</td>
<td>Energy Efficiency and Conservation Block Grants: state, local, and tribal programs</td>
<td>$2.8</td>
</tr>
<tr>
<td>Tax credits</td>
<td>Tax filers could claim 30% of the cost of energy efficiency investments up to a maximum of $1500</td>
<td>$2.0</td>
</tr>
<tr>
<td>Subsidized bonds</td>
<td>Clean Renewable Energy Bonds provide bondholders with a tax credit in lieu of interest</td>
<td>$1.6</td>
</tr>
<tr>
<td>Loan guarantees</td>
<td>DOE Section 1705 program</td>
<td>$2.5*</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Advanced Research Projects Agency – Energy (ARPA-E)</td>
<td>$400</td>
</tr>
<tr>
<td>Federal infrastructure</td>
<td>GSA financed Federal facilities retrofits</td>
<td>$4.5</td>
</tr>
</tbody>
</table>
Successes

- Created 900,000 job-years
- Leveraged private sector spending
- Renewable power capacity growth
  - 2020 wind 4X 2008 level
  - 2020 solar 100X 2008 level

U.S. Wind (top) and Solar Capacity, 2000-2018 (utility sector)
Shortcomings

Poor Targeting

- “Cash 4 Appliances”: 90% of subsidy claimants would have purchased an EnergyStar refrigerator without subsidy

Non-Federal Partners Withdrew from Projects

- Carbon capture and storage
- High-speed rail

Slow Roll-Out

- DOE Loan Guarantee Program
Weatherization Assistance Program: Realized Energy Gains Fall Short of Engineering Potential

Lessons from ARRA 2009
Lessons from ARRA 2009

- Be opportunistic
- Target! Target! Target!
- Keep it simple
- Act, learn, act
- Stimulus in context of long-term policies, goals
State Government Considerations
State Energy Programs

- Existing programs – WAP, State Energy Program – could be increased in future recovery package

- Challenge of ramping up energy programs as states manage major budget shortfalls

- Working with federal government to manage reporting and compliance burdens

- Seek out private sector partners to amplify state government efforts
Federal Spending and State Policy

• States with ambitious goals could benefit from federal subsidies for clean energy
  ▪ Federal renewable power tax credits could lower costs of state RPS goals
  ▪ Federal energy efficiency tax credits could lower costs of state EERS goals
  ▪ Federal EV tax credits could lower costs of state Zero Emission Vehicle goals

• Federal recovery efforts could enable more ambitious state policies
Thank You!

Joseph E. Aldy
Professor of the Practice of Public Policy
Harvard Kennedy School
79 John F. Kennedy Street, Mailbox 114
Cambridge, MA 02138
V: 617-496-7213
E: joseph_aldy@hks.harvard.edu
I: scholar.harvard.edu/jaldy
T: @josephaldy
State Strategies to Leverage Federal Dollars

Jennifer DeCesaro  
Department of Energy, Office of Electricity  

August 21, 2020
WIP Programs: State Energy Program (SEP) and Weatherization Assistance Program (WAP)

Find information about SEP and WAP funding for your state:
https://www.energy.gov/eere/wipo/weatherization-and-intergovernmental-program-office-project-map

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SEP FUNDING HISTORY (2010 – 2019)

WEATHERIZATION FUNDING

- 10% Administrative Costs
- 15% Health & Safety Costs
- 20% Training & Technological Assistance Costs
- 55% Program Operations Costs
- $4,695 AVERAGE WEATHERIZATION COST PER UNIT

- 8,500 JOBS SUPPORTED
- $283 ANNUAL ENERGY COST SAVINGS
- 18% ANNUAL HEATING CONSUMPTION SAVINGS
- 7% ANNUAL ELECTRIC CONSUMPTION SAVINGS
- FOR EVERY $1.00 INVESTED IN WEATHERIZATION, $1.72 IS GENERATED IN ENERGY BENEFITS AND $2.78 IN NON-ENERGY BENEFITS
FEMA Building Resilient Infrastructure and Communities (BRIC)

Day 2 Recap and Discussion