Governors' New Energy Policy
Advisors Bootcamp
May 9 - 10, 2019

National Governors Association Center for Best Practices

WIFI
Network: LeMeridien_Meetings
Password: spg2019

#WeTheStates
Welcome & Opening Remarks

Sue Gander, Division Director, Energy, Environment & Infrastructure, National Governors Association

Dan Lauf, Energy Program Director, Energy, Environment & Infrastructure, National Governors Association

Anne Clement, Senior Legislative Associate, Natural Resources Committee, NGA Advocacy

#WeTheStates
About NGA

Founded in 1908, the National Governors Association (NGA) is the collective voice of the nation’s governors. Our members are the governors of the 55 states, territories and commonwealths. NGA provides governors and their staff with services that range from representing states on Capitol Hill and before the Administration to developing and implementing innovative solutions to public policy challenges through NGA Solutions -- Center for Best Practices.
Serving 22 NEW governors in 2019
NGA Services

NGA SOLUTIONS
The NGA CENTER FOR BEST PRACTICES is the only research and development firm that directly serves the nation’s governors. Areas of expertise inside the division grow aptitude in five key public policy areas being shaped in the states.

NGA ADVOCACY
The mission of NGA GOVERNMENT RELATIONS is to ensure governors’ views are represented in the shaping of federal policy. The collective policy positions, reflecting governors’ principles on priority issues, guide the association’s efforts.

NGA CONSULTING
NGA provides leadership assistance targeting the complete life-cycle of an administration—from election day through the final year in office. NGA Consulting offers services, resources and training, as well as a one-of-a-kind spouses’ program.

NGA GLOBAL

NGA FUTURE

NGA PARTNERS
NGA’s Technical Assistance Toolkit

**Multi-State Meetings and Expert Panels:**
Convenings to help governors’ offices and state officials increase their understanding of issues and best practices through peer-to-peer exchanges and discussions with experts. The NGA Center organizes ~100 meetings annually.

**Policy Academies:**
Intensive technical assistance between policy experts and state teams over the course of one year (or more) to develop strategic action plans and begin to work towards tangible outcomes.

**Governors Response Team:**
Tailored responses to governors’ requests, which may consist of written analyses, on-site consultations or connections between states.

**Learning Labs:**
Opportunities for state teams to learn about and replicate innovative initiatives across states.

**Webinars and Calls:**
Ongoing opportunities to convey policy updates on a variety of issues of interest to governors and their staffs.

**Publications:**
Issue briefs, papers, reports, and actionable road maps with policy guidance for governors and their staffs.

**Retreats:**
Short gathering of state officials and external stakeholders for states to discuss policy issues, existing state solutions and develop consensus on next steps.
Provide governors state-based energy, environment and infrastructure solutions that enhance economic development, mobility, sustainability, reliability, resiliency, health and safety.
NGA’s Energy, Environment & Infrastructure Team

Sue Gander
Director

Dan Lauf
Energy Program Director

Jessica Rackley
Senior Policy Analyst

Patricio Portillo
Policy Analyst

Alyse Taylor-Anyikire
Senior Policy Analyst

Matt Rogotzke
Policy Analyst

Garrett Eucalitto
Transportation Program Director

Bevin Buchheister
Senior Policy Analyst
Energy, Environment & Infrastructure: A Year In Review

State Engagement in 2018
(Workshops, Institutes, Webinars, Technical Assistance, Learning Labs, etc.)

- Learning Labs: 3
- Publications (Reports, Roadmaps, Whitepapers, Etc.): 4
- Experts Roundtables: 4
- Policy Institutes, Workshops & Summits: 5
- In-State Retreats: 7
- Webinars: 10
- Technical Assistance Memos for States at Their Request: 15
- Outside events featuring an EET speaker: 20+

Governor Attended an Event

Created with InkScape and iHatso
Energy, Environment & Infrastructure Division Focus

**Power Sector Modernization**
- Energy Policy Institute
- Grid Modernization Retreats
- Global Energy Solutions Summit

**Resiliency**
- State Energy Risk Assessment & Planning Tool and State Resilience Retreats
- Grid Emergency Exercises
- State/Utility Coordination Workshop
- Housing Resilience Experts Roundtable

**Support for New Governors**
- Boot Camps and Webinars
- Energy Advisors
- Transportation Advisors
- Water Advisors
- Governors Guide to Energy Policy

**Technical Assistance on Demand**
- Research
- Policy Memos
- Consultations

**Smarter States, Smarter Communities**
- Learning Lab
- Roadmap
- Policy Academy Kick Off

**Transportation Modernization**
- Traffic Safety Learning Labs
- Electric Vehicle (EV) Regional Workshops
- Innovation Workshops
- Transportation Policy Institute

**Energy Efficiency**
- Lead By Example Workshop
- Energy Efficiency Experts Roundtable
- Energy Efficiency Roadmap for Governors

**Nuclear Weapons Waste**
- Federal Facilities Task Force Meeting
- Intergovernmental Meeting
- Governors Guide to Nuclear Weapons Waste Cleanup

**Water Policy Learning Network**
- Water Policy Institute
- Webinar Series
- Delaware River Basin Retreats
Power Sector Modernization

Recent Projects
• 2016 Experts Roundtable on Grid Modernization Technologies and State Policy Options
• 2017-18 Power Sector Modernization Policy Academy (KY, OR, RI, WA)
• Global Energy Solutions Summit (March 28-29, 2019)
• Transportation Electrification Regional Workshops (Winter – Spring, 2019)

Publications
• Powering Up: State Trends for Advancing the Use of Energy Storage (11/2017)
• Grid Smarts: State Considerations for Adopting Grid Modernization Technologies (11/2017)
• Opportunities for Governors to Align Electricity Markets with State Energy Policy Goals (11/2017)
Energy Security and Resilience

Recent Projects
• 2016 Grid Outage In-State Retreats (WA, WI)
• 2018 GridEx IV State After-Action Workshop (CT, IL, MA, SD, WI)
• 2018 State Resilience Retreats (ID, MD, OR)
• State Resilience Assessment & Planning Tool (beta version)
• Grid Outage Exercises (e.g., DOE Clear Path, NERC GridEx)

Publications
• Improving State Coordination for Energy Assurance Planning and Response (10/2016)
• Preparing States for Extreme Electrical Power Grid Outages (11/2016)
• Executive Authority During Energy Emergencies: A Road Map for Governors (7/2018)

Resilience is the ability to:
Withstand disasters better; Respond and recover more quickly; and Excel under new conditions
Energy Efficiency

Recent Projects
• 2016 Energy Efficiency Retreats (AK, MI, NH, VA)
• 2017 Lead by Example Retreats (MS, MD, NC, PA, WA)
• 2018 Lead by Example Workshop
• 2018 Energy Efficiency Experts Roundtable

Publications
• Advancing the Energy-Water Nexus: How Governors Can Bridge Their Conservation Goals (June 2017)
• Aligning Energy Efficiency and Demand Response to Lower Peak Electricity Demand, Reduce Costs and Address Reliability Concerns (August 2016)
And More...

**Nuclear Energy**
Policy scan released in April 2019

**Smarter States, Smarter Communities**
Roadmap coming summer, 2019
Workshop and in-state retreats coming late 2019, early 2020

**Energy/Water Nexus**
And other critical interdependencies

**Transportation Electrification**
Regional workshops held in late ‘18 thru spring 2019

**Ahead of the Curve: Innovation Governors**
On-Demand Technical Assistance

On-Demand State Technical Assistance
As-needed; quick turnaround

Direct Consultations
Remote or in-person

Quarterly Webinars
On a variety of topics; suggestions welcome!
State Introductions
State Introductions

• For state attendees, in 2-3 minutes please spend 2 to 3 minutes introducing yourself, and provide the following:
  1. Information on your background, and
  2. Describe your governor’s energy policy priorities.
Setting an Energy Policy Vision and Implementing Your Governor’s Priorities

- Moderator
  - Jessica Rackley, Senior Policy Analyst, NGA

- Speakers:
  - Sam Robinson, Deputy Chief of Staff, Pennsylvania Governor Tom Wolf
  - Alex Whitaker, former Policy Advisor to Colorado Governor John Hickenlooper
Levers and Language: An Overview of State Energy Policy and Regulation

• Moderator
  • Sue Gander, Division Director, NGA

• Speakers:
  • Rich Sedano, President and CEO, Regulatory Assistance Project
  • Branko Terzic, Managing Director, Berkeley Research Group
Power Sector Trends, Utility Regulation, State Developments and Advice

National Governors Association Energy Advisors Bootcamp

Richard Sedano
President and CEO
Regulatory Assistance Project (RAP)

50 State Street, Suite 3
Montpelier, Vermont
United States

+1 802 498 0710
rsedano@raponline.org
raponline.org

©️ 50 State Street, Suite 3
Montpelier, Vermont
United States
Plan for our time today

- Identify **Trends** Driving Actions
- Discuss **utility regulatory process**, the foundation for managing change
- Advice for state **executive branches**
- **Action** in selected states (if time allows)
Trends -- Innovation

- Customers
  - Needs, Wants, Nudges
- Clean Energy
  - Hard Costs, Soft Costs
- Technology
- Environment
- Markets and Regulatory Reforms
Trends: Customers
Costs and Fairness always important, new layers of interest on top of energy efficiency

- Larger Customers
  - Sustainability plans, private PPAs, Buyers Principles, Emerging end uses (data, indoor Ag)
- Smaller Customers
  - Solar + Storage + EV + etc.
- Locally sourced
  - Communities (resilience, solar, microgrid)
- The Internet, Apps, Controls, Behavioral Science
U.S. RENEWABLE ENERGY MAP: A GUIDE FOR CORPORATE BUYERS
Where customers can buy large-scale renewable energy through the grid

Utility Renewable Energy (RE) Deals
- Green tariff(s) and executed RE deal(s) through tariff
- Green tariff(s) but no deal(s) through tariff to date
- Considering a green tariff (proposal with the PUC)
- One-on-one RE deal(s) between companies and utilities, but no green tariff to date
- Electric retail choice easily available (EIA)
- No known direct large-scale RE access available

Buyersprinciples.org
Strengthening a community through local energy options.

The Brooklyn Microgrid reimagines the traditional energy grid model, with the concept of a communal energy network. While the utility provider still maintains the electrical grid that delivers power, the actual energy is generated, stored, and traded locally by members of the community, for a more resilient and sustainable clean energy model.

It's important to me that I'm involved with this Brooklyn Microgrid community because it's a ground level approach to establishing something that's gonna be much more common in years to come.

– Daniel Power, Brooklyn New York

Brooklyn.energy
Trends: Clean Energy

- Policy (climate, jobs)
- Planning
  - Integrated Resource P >>> Distribution Planning
- Procurement
  - Resource Standards >>> emissions stds
  - All source
- Access
  - PURPA >>> net metering >>> interconnect >>> distributed ledger and peer to peer
Trends: Technology

• Clean - electrification
• Fast – sensors, telecom, protected
• Smart – programmed, reactive
• Controls – larger, complex systems
• Increasingly Ubiquitous – both sides of the meter
  • Not evenly distributed
• Grid Integrated Efficient Buildings
Beneficial Electrification

- Standard for Electrification that receives policy support
  - Beneficial to decision-making consumers
  - Beneficial to the grid
  - Beneficial to the environment and society
Figure 2
Comparison of global emission levels resulting from the intended nationally determined contributions in 2025 and 2030 with other trajectories
Utility Regulation

- Objectives
- Characteristics
- Regulation balanced with Markets
- Effect on Utility
- State authority and Federal authority
Regulatory Process - Objectives

• Total Cost - control
• Prices - accurate
• Reliability - sufficient
• Fairness
  • Allocation, earnings, access, …
• Capital Access
  • Healthy regulated companies are in service to assure capital access
Process – Characteristics and Options

• Tradition: Reactive, evidence-based
  • Regulation originated as a delegation from legislatures

• Alternatives
  • Collaboratives, workshops, engagement
Process – Characteristics and Options

• Tradition: Reactive, evidence-based
  • Too Narrow? Room for initiative? Regulation originated as a delegation from legislatures
• Alternatives may recognize value in proactivity
  • Collaboratives, workshops, engagement
• Innovation is stifled with too much structure
• Innovation is stimulated with engagement
Regulation and Markets

• There is always a balance between regulation and markets
  • In a one-way system, markets are evident in wholesale, and customers make their choices
  • In a two-way or N-way system, customers are presented with more options
    • EE, Production (Solar), Storage, EVs, fuel switch, Grid integration, new suppliers of services, new rules (roles?) for utility
The One Way Grid

Figure 1: Today’s Power System Characterized by Central Generation of Electricity, Transmission, and Distribution to End-Use Consumers

EPRI
Utility Culture and Customers

- Most utility execs see this clearly
- Many do not trust government to manage the transition with due care
  - Munis and coops tend to have more latitude
- Many are arrogant about what should happen
- Many are taking steps to protect cash flow
  - Proposals to increase monthly charges, demand
- Government can guide progress
State / Federal: How cooperative is Cooperative Federalism?

- Basic idea: states manage in-state stuff
  - FERC manages inter-state commerce
- Where is the line?
- What are the inter-dependencies?
- When coordination makes sense, does it happen?
  - Regional State Committees
- States are advocates in federal forums
Regulation and The Executive

• Independence is a hallmark of regulation
• Isolation is bad for regulation
  • Awareness of social realities
  • Accounting for (accelerating) trends
  • Political/Social significance
  • Climate Change, other regional national shared interests
What can the Executive Do?

- Appoint
- Convene
- Cajole
- Lead (with a vision for using technology and more active customers to address needs, position for the future)
- Collaborate regionally, cross-sectorally
- Manage actively state – utility relationship
Perpetual and Emergent Issues

- The utility role
- Cost control
- Throughput incentive
- Capital bias
- How utilities earn
- Procurement
- Price signals

- The Public Interest
- Fairness
- Access
- Outcomes
States to talk about

- California and New York
- Rhode Island and Oregon
- Minnesota and Michigan
- Arkansas and North Carolina
What’s Happening out there – Big States

New York
- Reforming the Energy Vision (REV)
- Reconsider utility role
- Customer resources

California
- Clean energy and climate priorities
- Incremental changes to key jobs utilities do
What’s Happening out there – Small States

Rhode Island
- Power Sector Transformation
- Report of Phase 1

Oregon
- Performance Reg.
- Climate
- Report to Legislature
What’s Happening out there – Interior States

Michigan
- Reformed IRP
- Performance

Minnesota
- Decoupling
- Community solar
- Distribution planning
- Performance
Southeast States

Arkansas
• New workshop process starting to reduce barriers to distributed resources

North Carolina
• Clean Energy Plan Development Process underway
• Implementing an Executive Order
Final Word

- Because changes are prompted by technology and consumers, trends are **unstoppable**
- Because regulation will always tend to the vulnerable, change will be **slower** than some want
- Because change has deep social effects, **politics** must guide if change is to favor the **public interest**
- Because implementation takes effort, **planning** is valuable
Selected Resources

- Selected Issues in Power Sector Transformation (used as a framing document for the Oregon process)
- Getting From Here to There: Regulatory Considerations for Transportation Electrification
- Teaching the Duck to Fly – Second Edition
About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org
National Governors Association
Bootcamp for Energy Policy Advisors

Levers and Language: An Overview of State Energy Policy

Dr. h.c. Branko Terzic

May 9, 2019
Arlington, VA
Biography

Speaker: Branko Terzic
Managing Director
Berkeley Research Group LLC

Distinguished Fellow
Council on Competitiveness
and
Senior Fellow
Atlantic Council

Profile: Formerly;
Chairman, CEO Yankee Energy System,
Commissioner, US Federal Energy
Regulatory Commission (FERC),
Commissioner, State of Wisconsin Public
Service Commission (PSCW)

BS in Energy Engineering and
Honorary Doctor of Sciences in Engineering
University of Wisconsin – Milwaukee.
U.S. primary energy consumption by source and sector, 2016
Total = 97.4 quadrillion British thermal units (Btu)
Electric Service = Power & Energy

• Power & Energy

POWER: rate of energy delivery
• 13 Strong men
• = 2 Draft horses
• = 1.34 horsepower
• = 1 kiloWatt

ENERGY: ability to do work
– kiloWatt-Hour
– 3.6 MJoules
– Therms
– BTU
How much HP does your house need?

US Average home has 27 electric devices

- Water heater: 3 kW
- Lighting: 1 kW
- Microwave: 1.7 kW
- Dishwasher: 1 kW
- Spin dryer: 3 kW
- Washer: 1 kW
- Iron: 2 kW
- Toaster: 1 kW
- Kettle: 2 kW

- Refrig/Freezer: 1 kW
- Vacuum: 1.2 kW
- Hair dryer: 1.5 kW
- TV (3 sets): 1 kW
- Air Con (4 rms): 6 kW
- Garage dr: 1 kW

27 kW = 36 HP

California average solar array is 4-6 kW
In addition to the 37 regions depicted here, there are separate coal supply regions for Alaska and Imports, for a total of 39.
Oil Shale and Natural Gas Shale – Where they are

North American shale plays (as of May 2011)

Source: U.S. Energy information Administration based on data from various published studies. Canada and Mexico plays from ARI. Updated: May 9, 2011
Shale basins and the U.S. pipeline grid

Source: American Clean Skies Foundation.
Several states have established aggressive goals for renewable energy production (RPS), many of which have specific carve-outs for solar energy.

**U.S. Domestic Renewable Energy Goals**

Source: www.dsireusa.org
Advisor Roles

Governor

Advisors/ Energy & Other

Cabinet Secretaries
Agency/Office Heads
Legislative Liaison
Governor’s Tools

- Legislation
- Administrative Rules
- Executive Orders
- Court Cases
- Bully Pulpit
- Key Appointments (PSC, Advisor)
Governor’s Goals → Energy Plan → Orders, Rules, Legislation
Governor Murphy Signs Measures to Advance New Jersey’s Clean Energy Economy

05/23/2018

**MONMOUTH JUNCTION** – Bolstering his commitment to New Jersey’s energy future, Governor Phil Murphy today signed several legislative initiatives to establish New Jersey’s leadership in the clean energy economy. Governor Murphy also signed an executive order directing the development of an updated Energy Master Plan (EMP) for the state to achieve 100 percent clean energy by 2050.
The State Energy Plan

• “A well-constructed state energy plan provides an assessment of current and future energy supply and demand, examines existing energy policies, and identifies emerging energy challenges and opportunities.”

• NASEO’s State Energy Planning Guidelines
State Energy Plan Objectives I

• Identify and vet strategies to accelerate energy-related economic development, and ensure policies and programs reflect market needs and opportunities;
• Ensure that new and existing policies and programs related to grid modernization, energy emergency preparedness, energy efficiency, and others are coordinated and complementary;
• Build consensus around state energy policy and investment decisions;
• Build a long-term energy roadmap that is based on widely accepted data and analysis; [continued next page]

• Ref: NASEO Guidelines
State Energy Plan Objectives II

- Manage risk (e.g., physical and cyber security) associated with energy markets to ensure that system reliability and integrity are maintained;
- Assign responsibility for specific energy actions and provide resources for successful implementation of plan recommendations;
- Enhance transparency and accountability within state government; and
- Serve as a guide for economic development, workforce training, and prudent stewardship of a state’s natural resources.

Ref: NASEO Guidelines
NASEO State Energy Planning Steps

**Step 1**: Establish a Requirement and Scope for a State Energy Plan

**Step 2**: Convene the Planning Team

**Step 3**: Develop a Vision for the State Energy Plan

**Step 4**: Conduct Data Collection and Projection Analyses

**Step 5**: Garner Public Input and Feedback

**Step 6**: Establish Goals and Recommended Actions to Meet the Vision

**Step 7**: Draft the State Energy Plan

**Step 8**: Finalize, Adopt, and Implement the Plan

**Step 9**: Conduct Outreach and Education

**Step 10**: Monitor Progress and Update the Plan
State Energy Plan Components

- Assessment of the current energy profile, industries, and institutional capacity, with a focus on the unique energy assets within a state;
- Energy outlook, forecast, or projection of future needs including supply, demand, and costs;
- Vision of the desired energy future;
- Challenges to be addressed;
- Goals and strategies;
- Prioritized and specific actions with timeline and evaluation and measurement criteria;

and

- Identification of potential financing and funding mechanisms to support implementation of the recommended actions.

Ref: NASEO Guidelines
Typical Policy Program Areas

Demand-side policies and program
  Energy efficiency
  Renewable energy

Supply-side policies and programs
  Alternative fuels
  Natural Gas and Oil
  Electricity
  Coal
  Nuclear
Example: New Hampshire 10 Year Strategy

- Electric Grid of the Future
  - Open PUC Docket on Grid Modernization
- Increase Investments in Cost Effective Energy Efficiency
  - Set energy efficiency goal
  - Address utility disincentives
  - Improve coordination and design of existing programs
  - Improve customer access to financing
  - Do more to reduce costs for low income neighbors

- Fuel Diversity and Choice
  - Strengthen and stabilize Renewable Portfolio Standards
  - Encourage Distributed Energy Resources
    - Attract private financing
    - Expand use and scope of renewable property tax exemption

- Increase transportation options
  - Enable and encourage adoption of plug-in electric vehicles
- Identify sustainable transportation funding mechanisms
- Expand and coordinate mass transit
- Support efforts to maintain and expand rail
- Expand ride-share
- Reduce unnecessary idling
Some Recommended Reading

• Electricity
  – The Grid: A Journey Through the Heart of our Electrified World by Phillip Schewe

• Natural gas
  – Shale Gas: The Promise and the Peril by Vikram Rao
  – The Political Economy of Pipelines by Jeff Makholm

• Oil
  – Oil 101 by Morgan Downey
  – Oil: Beginners Guide by Vaclal Smil

• Global Energy

• Energy Sources
  – Energy: A Human History by Richard Rhodes

• Nuclear
  – Energy for Future Presidents by Richard A. Muller

• Solar
  – Sun Above The Horizon by Peter Varadi
Knowles Law of Legislative Deliberation

“The length of debate varies inversely with the complexity of the issue.”

Corollary: When the issue is simple and everyone understands it, debate is almost interminable.

State Senator (WI) Robert Knowles (1916-1985)

Ref: The Official Rules, Paul Dickson Dover, 2013
Proposed State Energy Strategy Draws Critics

...NEW PLAN FALLS SHORT OF WHAT IS NEEDED....

Draft energy plan draws criticism from environmental activists

...needs to be more emphasis on renewable energy...

Scientists Sharply Rebut Influential Renewable-Energy Plan

Nearly two dozen researchers critique a proposal for wind, solar, and water power gaining traction in policy circles.

...it contained modeling errors and implausible assumptions that could distort public policy and spending decisions...
Shorr’s Laws of Economics

If there are imperfections in the structure of the marketplace, entrepreneurs will make lots of money.
If there are no imperfections in the structure of the marketplace, entrepreneurs will make imperfections in the structure of the marketplace.

Ref: The Official Rules, Paul Dickson, Dover, 2013
Appendix

Details of State Energy Plans
Demand side programs

Energy Efficiency

- Output based regulation
- Energy codes
- Green building standards
- Appliance standards
- Investment incentives for energy efficiency technologies
- Demand response
- Energy Efficiency Resources Standards “EERS”

Renewable Energy

- Green pricing
- Alternative vehicle fuels
- Green power purchasing requirements
- Net metering rules
- Interconnection standards
- Production incentives
- Investment incentives
Supply side programs I

**Alternative Fuels**
- Biofuels production incentives
- Zero emission vehicle (ZEV) incentives
- Low emission vehicle (LEV) incentives

**Natural gas and oil**
- Streamlined permitting and reporting
- Enhanced oil and gas recovery incentives- "fraking"
- Production incentives for oil
- Production incentives for natural gas
Supply side programs II

**Electricity**
- Industry structure
- Generation disclosure requirements
- Energy efficiency resource standards
- Resource portfolio or energy standards “RPS”
- Distributed energy resources “DER”
- System benefit fund

**Coal and Nuclear**
- Tax credits new clean coal
- Indigenous coal use incentive
- Coal production incentives
- Nuclear market support
Overarching Policy Driver Metrics

• Economic development
  – Value of industry
  – Gross state product impact
  – Jobs impact

• Environmental
  – Local air quality
  – Greenhouse gas emissions

• Energy Security
  – Fuel import offset
  – Fuel diversity

Trivia Time!
Question 1:

- The Governor of which state/territory sent the world’s longest telegram ever sent by Morse Code?
In October 1864, Nevada’s Governor James Nye sent the state’s constitution via Morse Code (through Salt Lake City and then Chicago) to ensure the state was admitted to the union prior to the presidential election.
Question 2:

- Which state in the continental U.S. charges the highest residential electricity prices?
Connecticut

- The state charges on average 21.56 cents per kWh on residential electricity bills. The national average is 12.47 cents per kWh
Policy Deep Dive: Grid Operations in a Distributed World

• Speaker:
  • **Darlene Phillips**, Senior Director, Operations Engineering Support, PJM
Grid Operations in a Distributed World

Darlene Phillips
Sr. Director, Operations Engineering Support
PJM Interconnection

Bootcamp for Governors’ New Energy Policy Advisors
May 9, 2019
PJM Expansion History

- 1927 – Started three utility power pool
- 1997 – Started RTO with eight TOs
- June 2002 – AP Joined
- May 2004 – ComEd joined
- October 2004 – AEP/Dayton
- May 2005 – Dominion joined
- January 2006 – Duquesne joined
- June 2011 – FirstEnergy joined
- January 2012 – Duke joined
- June 2013 – EKPC joined
- December 2018 – OVEC joined
Focus on Just 3 Things

1. Keeping the Lights On
2. Facilitating Efficient Electricity Trading
3. Planning for the Future

Service

Adding Value
2018 Renewable Energy in PJM

MWh (milions)

- Biomass
- Solar
- Wood
- Methane
- Solid Waste
- Water
- Wind

Years:
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
2018 Wind Capacity in PJM
Generation is Stated in MWh

Cumulative Nameplate (MW)

Wind Installed Capacity in PJM:
Operational and Proposed

Operational

RPS Requirement

36,159 MW

Proposed Offshore Wind

Proposed Onshore Wind

www.pjm.com

PJM©2019
Appendix
Value Proposition

Total Annual PJM Value: $2.8 to 3.1 billion

- Grid Services: $100 million savings
- Reliability: $475 million savings
- Integrating More Efficient Resources: $600 million savings
- Energy Production Costs: $525 million savings
- Generation Investment Savings of $1.1 to $1.4 billion
Industry Paradigm Shift

Unprecedented number of changes in the power industry

Storage technologies

Distributed energy resources

Intermittent renewables

Alternative technologies

Fuel Swap

Changes in customer expectations
Power Up with the PJM Now App!

- See real-time demand
- Track power prices
- Get notifications

GET IT ON Google Play
Download on the App Store
PJM Wholesale Cost – 6 Years

- 2011: $61.66 (Energy: $45.94, Reliability Capacity: $9.49, Transmission: $5.23)
- 2012: $47.78 (Energy: $35.23, Reliability Capacity: $6.02, Transmission: $6.53)
- 2013: $52.96 (Energy: $38.67, Reliability Capacity: $5.00, Transmission: $9.29)
- 2016: $47.49 (Energy: $29.27, Reliability Capacity: $9.39, Transmission: $8.73)
- 2017: $49.63 (Energy: $31.06, Reliability Capacity: $8.73, Transmission: $9.84)
PJM Wholesale Rates (2014-2018)

$/kWh of usage

2014 2015 2016 2017 2018

Residential Retail Rate  Wholesale Component*

*Includes LMP, capacity, transmission, ancillary services and other costs

Sources: EIA, EEI, Monitoring Analytics, PJM

www.pjm.com
2018 PJM System Mix (MWh)

- Nuclear, 286,003,920 (34.5%)
- Gas, 258,034,092 (31.2%)
- Coal, 237,587,770 (28.7%)
- Oil, 1,741,837 (0.2%)
- Renewables, 44,850,102 (5.4%)
2018 PJM Fuel Mix

- Coal: 28.7%
- Gas: 31.2%
- Nuclear: 34.5%
- Other: 5.4%
- Wind: 2.6%
- Water: 1.5%
- Solid Waste: 0.5%
- Methane: 0.3%
- Solar: 0.3%
- Wood: 0.2%
- Biomass: 0.0%

(% Annual Energy)
Percentage of Renewable Energy is Small but Growing

PJM Generation Mix – 2018
Annual Energy

- Gas, 31.2%
- Nuclear, 34.5%
- Coal, 28.7%
- Renewables, 5.4%
- Oil, 0.2%

Renewable Energy
Ten Years of Renewable Growth in PJM

**PJM Grid-Connected Solar**

**Behind-the-Meter Solar**

Source: GATS
## Wholesale DER

### 1 GW Demand Response

- **Customer-sited generation:** Offers into capacity, energy and/or ancillary services markets
  - 74% Diesel
  - 24% Natural Gas
  - 2% Other

Remaining ~8 GW of DR is load modification without any generation (e.g., industrial process management)

### 1 GW Generator

- **Front-of-the-meter generation:** Offers into capacity, energy and/or ancillary services markets. Can be sited at customers.
- Mostly solar but also other fuels

## Non-Wholeale DER

### ~7 GW DER

- **Solar PV DER:** Retail/rooftop solar
- **Municipal DER:** Municipal electric company distribution-level generators
- **Process DER:** Industrial generators, combined heat and power
- **Resilience DER:** Emergency backup
- **Qualified Facilities:** Direct sales to distribution utilities
Lunch Keynote: Incorporating Equity in State Energy Policymaking

• Speaker:
  • John Howat, Senior Energy Analyst, National Consumer Law Center
Median 2015 Home Energy Burdens by Income Category and Census Region

Northeast

Midwest

South

West

Less than $20,000

$20,000 - $39,999

$40,000 to $59,999

$60,000 to $79,999

$80,000 to $99,999

$100,000 to $119,999

$120,000 to $139,999

$140,000 or more

Less than $20,000

$20,000 - $39,999

$40,000 to $59,999

$60,000 to $79,999

$80,000 to $99,999

$100,000 to $119,999

$120,000 to $139,999

$140,000 or more
Loss of Heat in the Past Year Due to Unaffordable Utility Service, Fuel or Heating System Repair by Race: U.S.
Loss of Heat in the Past Year Due to Unaffordable Utility Service, Fuel or Heating System Repair by Ethnicity: U.S.
Frequency of Reducing or Forgoing Basic Necessities Due to Home Energy Bill by Household Income Category - U.S.
Frequency of Reducing or Forgoing Basic Necessities Due to Home Energy Bill by Race - U.S.
Frequency of Keeping Home at Unhealthy Temperature by Household Income Category: U.S.
Credit and Collection Data Points

- Number of residential accounts
- Total billed and receipts amounts
- Total number of “protected” accounts (e.g., for serious illness, elderly, disability)
- Number and dollar value of unpaid accounts 30-60 days after issuance of a bill
- Number and dollar value of unpaid accounts 60-90 days after issuance of a bill
- Number and dollar value of unpaid accounts 90+ days after issuance of a bill
- Number of accounts referred to collection agencies
- Number of new payment agreements
- Number of accounts sent notice of disconnection for non-payment, and number of service disconnections for non-payment
- Number of service restorations after disconnection for non-payment
- Number of customers completing an extended payment plan
- Average duration of service disconnection for restored accounts
- Number and dollar value of accounts written off as uncollectible
Low-income Home Energy Security Safety Net

Affordable Payments  Consumer Protections  Efficient Usage
“Reversing Energy System Inequity: Urgency and Opportunity During the Clean Energy Transition”
Keys to Success: Engaging Your Legislature, Regulators, and Other State Partners

• Moderator
  • Dan Lauf, Energy Program Director, NGA

• Speakers:
  • Rick Bender, Executive Director, Kentucky Office of Energy Policy
  • Emma Cimino, former policy advisor to Connecticut Governor Dannel Malloy
Trivia Time!
Question 3:

- Which state/territory observes only 2 national holidays?
Guam

• Guam Discovery Day is held on the first Monday in March. Liberation Day is on July 21st.
Question 4:

• Which state/territory has no poison ivy or poison oak?
• Alaska is the only state that does not have any poison ivy or poison oak. It also does not have any poisonous snakes!
Policy Deep Dive: The Benefits and Opportunities of Energy Efficiency

• Speaker:
  • Annie Gilleo, Senior Manager, State Policy, American Council for an Energy Efficient Economy
Energy Efficiency Opportunities
Impactful Policies and Programs

Annie Gilleo
Senior Manager, State Policy
May 9, 2019
The American Council for an Energy-Efficient Economy is a nonprofit 501(c)(3) founded in 1980. We act as a catalyst to advance energy efficiency policies, programs, technologies, investments, & behaviors.

Our research explores economic impacts, financing options, behavior changes, program design, and utility planning, as well as US national, state, & local policy.

Our work is made possible by foundation funding, contracts, government grants, and conference revenue.
In the electricity sector, efficiency is now our 3rd largest resource.

http://aceee.org/research-report/u1604
MORE ENERGY EFFICIENCY = MORE CONSTRUCTION JOBS

- More than 1 out of every 6 US construction workers spend 50% or more of their time on Energy Efficiency (18%)
- Nearly 60% of energy efficiency's 2.25 million employees work in construction (1.27 million)
- 80% of energy efficiency construction businesses say employees spend a majority of their time on energy efficiency—an increase from last year (74%)

EE JOBS ACROSS THE COUNTRY

- These jobs are local. 99.7% of U.S. counties have energy efficiency jobs
- Energy efficiency now employs workers in more than 3,000 of America's 3,007 counties
- More than 300,000 Americans living in rural areas work in energy efficiency
- America's Top 25 metro areas employ 900,000 workers in energy efficiency
- 35% of U.S. energy workers are involved in energy efficiency

GROWTH ACROSS AMERICA

- There are 353,269 energy efficiency businesses in America

GROWTH FOR THE FUTURE

- Energy efficiency businesses are projecting 9% growth in jobs for 2018
- ...and the job growth is expected across all major industries

ACEEE
American Council for an Energy-Efficient Economy

E2 and E4TheFuture. Energy Efficiency Jobs in America

If demand growth had remained near 2% and carbon intensity fixed at 2005 levels, emissions would have been 3,043 MMmt in 2017.

Lower demand growth alone reduced emissions by 654 MMmt.

Switching among fossil fuels further reduced emissions by 329 MMmt.

Adding noncarbon sources reduced emissions by 316 MMmt.

After these reductions, actual carbon dioxide emissions in the power sector were 1,744 MMmt in 2017.
More benefits of energy efficiency

- Lowers energy bills for households and businesses
- Brings a return on investment of 200% or more
- Reduces energy burdens for those most in need
- Improves health, safety, and comfort
- Increases community and grid resilience

This Photo by Unknown Author is licensed under CC BY-ND
State Leadership
2018 State Energy Efficiency Scorecard
Communicating a Vision

- State Energy Plan
- Cross-agency coordination
Energy Efficiency in the Utility Sector

- Set energy savings goals
- Promote regulatory reforms
  - Utility business model
  - Rate design
  - Data access
  - Long-range planning
  - Cost-effectiveness testing
Energy-efficient Transportation

- Strategies to accelerate adoption of zero emissions vehicles
- Complete Streets and land use planning
- Sustainable transit funding
- Targets for VMT and freight movement
Energy Efficiency in Buildings

- Building energy codes
- Labeling and disclosure
Leading By Example

- Efficient state buildings
- Efficient fleets
- Focus on procurement, plug loads, and behavior
Efficient Appliances

- Set new standards
- Protect national standards
Reaching Underserved Communities and Sectors

- Energy office programs
  - Rural communities
  - Industrial and manufacturing technical resources
- Coordinate assistance for low-income households
- Scale financing options
ACEEE Resources

• State Policy Database
  • https://database.aceee.org/

• State Energy Efficiency Policy Toolkits
  • https://aceee.org/sector/state-policy/toolkit

• Governors Toolkit for Energy Efficiency
  • https://aceee.org/topic-brief/governors-ee-toolkit

• Technical Assistance for Policymakers
Flash Mentoring Session

• Mentors:
  • **Sam Robinson**, Deputy Chief of Staff, Pennsylvania Governor Tom Wolf
  • **Rick Bender**, Executive Director, Kentucky Office of Energy Policy
  • **Emma Cimino**, former policy advisor to Connecticut Governor Dannel Malloy

• Speaker:
  • Richard Glick, Commissioner, Federal Energy Regulatory Commission
Trivia Time!
Question 5:

- Which state/territory has the largest annual fireworks display?
Kentucky

- Thunder Over Louisville is the annual kick-off to the Kentucky Derby
• Which state/territory exports the most electricity?
Pennsylvania

• According to EIA data, Pennsylvania exports the most electricity.
Working with State Partners: Energy Resources, Roles, and Responsibilities Across State Government

- Moderator
  - Dan Lauf, Energy Program Director, NGA
- Speakers:
  - David Terry, Executive Director, National Association of State Energy Officials
  - Danielle Sass Byrnett, Director, Center for Partnerships & Innovation, National Association of Regulatory Utility Commissioners
  - David Springe, Executive Director, National Association of State Utility Consumer Advocates
  - Glen Anderson, Energy Program Director, National Conference of State Legislatures
New Energy Policy Advisors Bootcamp
May 9 - 10, 2019

WIFI Network:
Password:

WeTheStates
Welcome and Additional Resources

Jessica Rackley, Senior Policy Analyst, NGA
NGA’s Energy Policy Learning Network is the premier energy policy resource for governors and their staff, focusing on a range of timely and relevant topics. Through the Network, governors’ energy policy advisors have access to NGA resources, expertise, and consultations. They also have opportunities to convene, network, and share best practices with peers and experts.

**Globally Energy Solutions Summit (March)**
NGA co-hosted the Global Energy Solutions Summit with the Embassies of Australia, Canada, and Denmark; it focused on three technology areas – offshore wind, energy storage, and carbon capture, utilization and storage. The Summit was held on March 28-29, 2019, in Washington, D.C., and paired examples of advancing these technologies in the U.S. and internationally.

**Energy Policy Institute (July)**
The Annual Energy Policy Institute gathers state officials for peer-to-peer exchanges, strategy sessions, and discussions with national thought-leaders on a diverse set of energy policy issues. Topics discuss span the range of energy policy topics, addressing financing, regulation, planning, and innovation.

**Lead by Example Workshop (October)**
NGA’s Lead-by-Example (LBE) workshop (Oct. 2019) will help states better tap into opportunities to reduce energy consumption and expenses in public buildings. Topics covered will include innovative financing and models to incentivize greater state agency participation.
Upcoming Events

Power Sector Modernization
• Grid Modernization In-State Retreats (Fall 2019)

Energy Efficiency
• Lead by Example Financing Workshop (October 2019)

Energy Security and Resilience
• Energy Security and Resilience Coordination Experts Roundtable (August 2019)
• Critical Infrastructure Cybersecurity Initiative (Ongoing)
Upcoming Resources

**Power Sector Modernization**
- Global Energy Solutions Summit Summary (May 2019)
- Transportation Electrification Summary Takeaways (Summer 2019)
- Clean Energy Toolkit (Summer 2019)
- Smarter States Smarter Communities Roadmap (Summer 2019)

**Energy Efficiency**
- Energy Efficiency Primer for Governors (Summer 2019)

**Energy Security and Resilience**
- State Electricity Cybersecurity White Paper (Spring 2019)
- Energy Security and Resilience Coordination White Paper (Summer 2019)
- State Resilience Assessment and Planning Tool (late 2019)
- Grid Outage Exercise Support (e.g., DOE Clear Path, NERC GridEx)
On-Demand Technical Assistance

On-Demand State Technical Assistance
As-needed; quick turnaround

Direct Consultations
Remote or in-person

Quarterly Webinars
On a variety of topics; suggestions welcome!
Join us in St. Paul, MN for our Annual Energy Policy Institute, July 18\textsuperscript{th} and 19\textsuperscript{th}
Working with Washington, Part 2: Resources and Partnerships at the U.S. Department of Energy

• Moderator:
  • Sue Gander, Division Director, NGA

• Speakers:
  • Adrienne Lotto, Acting Principal Deputy Assistant Secretary, Office of Cybersecurity, Energy Security, and Emergency Response, U.S. Department of Energy
  • Katie Jereza, Deputy Assistant Secretary, Transmission Permitting & Technical Assistance, Office of Electricity, U.S. Department of Energy
  • Alex Fitzsimmons, Chief of Staff, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy
  • Mark Planning, Director, Intergovernmental & External Affairs, U.S. Department of Energy
Policy Deep Dive: Preparing for and Responding to Energy Emergencies

• Moderator:
  • Dan Lauf, Energy Program Director, NGA

• Speakers:
  • Art House, Chief Cybersecurity Risk Officer, State of Connecticut
  • Paul Holloway, Emergency Planning & Energy Analyst, Massachusetts Department of Energy Resources
National Governors Association

Preparing for and Responding to Emergencies

Paul Holloway
Emergency Planning & Energy Analyst
Massachusetts Department of Energy Resources
Defining Resilience

- Presidential Policy Directive 21-- Critical Infrastructure Security defines “resilience” as
  
  ‘the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents’

- Resilience is not 100% provision of service 100% of the time
  - Resilience is instead a time varying description of the level of service provided following a disruptive event

Figure 2.2 from RAND Study RR883

Measuring the Resilience of Energy Distribution Systems
Value in Planning for Emergencies

- Minimize impacts
- Provide specific strategies/menu of options for coordinating actions to manage the disruption
- Details roles & responsibilities for key government & industry stakeholders
- Structure for information sharing

- Flexible to supports a wide-range of incidents
- Process as Important as Product:
  - Understand supply chain
  - Energy Use
  - Key assets /infrastructure
  - Industry and govt. contacts
  - actionable checklists
- Informs investments
- Inspires Public Confidence
The MA Energy Assurance Plan Structure

I. Energy Profile
   ▪ Energy Use and Expenditures by sector
   ▪ Energy Supplies
   ▪ Key energy resources, infrastructure, distribution system

II. Vulnerability and Risk Assessment
   ▪ Vulnerabilities/Risk to energy infrastructure
   ▪ Interdependencies
   ▪ Critical Assets/Supply
   ▪ Consequences

III. Emergency Response Management Plan
   ▪ Energy emergency strategies/implemention procedures
   ▪ Industry/State Actions
   ▪ Legal Authorities
   ▪ Roles/Responsibilities of industry stakeholders in response/recovery

IV. New & Emerging Tech
   ▪ Smart-grid, renewables, biofuels, micro-grids, CHP
# Vulnerability and Risk Assessment

<table>
<thead>
<tr>
<th>Natural Hazards</th>
<th>Deliberate Acts</th>
<th>Technological Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Winter Storm/Nor’easter</td>
<td>Cyber Incident</td>
<td>Infrastructure Failure</td>
</tr>
<tr>
<td>Inland Flooding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Flooding</td>
<td>Terrorism</td>
<td></td>
</tr>
<tr>
<td>Other Severe Weather</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hurricane/Tropical Storm</td>
<td>Civil Unrest</td>
<td>Nuclear Power Plant Event</td>
</tr>
<tr>
<td>Coastal Erosion</td>
<td></td>
<td>Hazard Material Accident/Spills</td>
</tr>
<tr>
<td>Tornado</td>
<td></td>
<td>Major Air Crash</td>
</tr>
<tr>
<td>Extreme Temperatures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invasive Species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earthquake</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildfire</td>
<td>Chemical, Biological, Radiological, and Nuclear (CBRN) Incident</td>
<td>Dam Failure</td>
</tr>
<tr>
<td>Drought</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landslide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tsunami</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Health Emergency</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2018 Massachusetts Hazard Identification Risk Assessment (HIRA)
# Critical Energy Infrastructure

<table>
<thead>
<tr>
<th>Sector</th>
<th>Subsector</th>
<th>Critical Asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>Generation</td>
<td>Mystic 8 &amp; 9</td>
</tr>
<tr>
<td></td>
<td>Transmission</td>
<td>Hydro Quebec HVDC and NSTAR 345 kV</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Pipelines</td>
<td>Algonquin and Tennessee Interstate Pipelines</td>
</tr>
<tr>
<td>Liquefied Natural Gas</td>
<td>Terminals</td>
<td>DistriGas Everett Terminal</td>
</tr>
<tr>
<td></td>
<td>Satellite Facilities</td>
<td>Storage and Liquefaction</td>
</tr>
<tr>
<td>Petroleum</td>
<td>Terminals</td>
<td>High percentage (~ 70-80%) of terminal storage capacity in Boston harbor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Three terminals upstream of Chelsea Creek Bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Most Springfield terminals served by common pipeline</td>
</tr>
<tr>
<td></td>
<td>Pipeline</td>
<td>Energy Transfer Partners jet fuel line to Logan Airport</td>
</tr>
<tr>
<td>Propane</td>
<td>Primary and secondary storage</td>
<td>Primary day storage in Selkirk, NY</td>
</tr>
</tbody>
</table>

*Massachusetts - Critical Assets by Sector and Subsector*
Vulnerability & Criticality by Sector

Also see - Threat vs. Consequence

Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth
Important to Know . . .

• Authorities and Responsibilities
 ➢ Ex. Civil Defense Act, MGL 25A
 ➢ Utility Regulators vs Energy Office vs EMA vs Industry

• Energy Supply Characteristics
 ➢ Commodity (bought & sold at margins)
 ➢ Changing market dynamics; renewables, just-in-time delivery, less on-site stored fuels
 ➢ Retirements (Coal, Oil, Nuclear)
 ➢ More Single Source Dependent = More Risk
Available Tools

- Pre-Winter Preparedness Mtg
- Hurricane Season WGs
- Prioritize resiliency and renewables and diverse sources of energy
- Maintain plans & contacts
- Driver Hour Waivers
- Emission Waivers
- Prioritize Delivered Fuels
- Voluntary & Mandatory Conservation
- Interruptible Gas
- Support to Industry
State Energy Context

Resilience

Methods to improve reliability and resilience at the end of a supply chain

1. **Action Plan**
   - Identify hazards, plan enduring strategies and acute responses
   - Massachusetts Hazard Mitigation & Climate Adaptation Plan

2. **Reduce consumption and reliance**
   - Massachusetts ranked #1 in efficiency 8 consecutive years
   - Distributed generation programs to incent generation co-located with load

3. **Harden load to impact of disruption**
   - $40M Energy Resilience Initiative & Municipal Vulnerability Preparedness

4. **Diverse & redundant supplies** (prevent single-points-of-failure)
   - 2016 Energy Diversification Bill; procure off-shore wind and hydroelectric resources

5. **Harden supply chain**
   - Grid Modernization docket for Utilities to automatically resection the distribution system to mitigate the impacts of outages
Massachusetts Policies
Supporting Energy Resiliency (1 of 2)

• Collaboration with Municipalities
  – Green Communities program provides technical assistance and grants
  – Municipal Vulnerability Preparedness (MVP) program provides technical assistance and grants

• Collaboration across State Agencies

• Leading by Example
  – Leading By Example Division energy resilience grants
  – Division of Capital Asset Management Resiliency Initiative

• Energy Efficiency Incentives
  – MA ranked #1 in Energy Efficiency by ACEEE 8 years in a row
Massachusetts Policies
Supporting Energy Resiliency (2 of 2)

• Distributed Generation Incentives
  – New SMART solar program incentivizes pairing energy storage with solar
  – SMART program provides additional incentive for public consumers of solar energy
  – CHP and Fuel Cells incentivized through the Alternative Portfolio Standard (APS)
    • Also incentivizes renewable thermal (solar thermal, air source heat pumps, ground source heat pumps, bio-fuels)
  – Demonstration grants: $20M Energy Storage Initiative, $40M Clean Energy Resiliency (CHP for critical facilities)

Buying Down Risk
Other Resources

- Agency Plans/SOPs
- Hour Of Service (HOS) Waiver Guidance for Industry
- Continuity of Operations Plan (COOP)
- Industry ERP Plans (Power Utility and Gas LDCs)
- ISO/RTO Procedures
- Subject Matter Expertise

- State CEMP (ConOps)
- ESF-12 Annex (Energy)
- State Petroleum Fuel Coordination Plans
- Hazard Mitigation/Climate Adaptation Plan
- 2018 Comprehensive Energy Plan
- 2017 Energy Storage Initiative
- 2020 Clean Energy & Climate Plan
Trivia Time!
Question 7:

- Which state/territory claims to be the birthplace of the ice/cream sundae?
Wisconsin

- In 1881, in the town of Two Rivers, George Hallauer asked Edward C. Berners, the owner of Berners’ Soda Fountain to drizzle chocolate syrup over ice cream. Berners wound up selling the treat for a nickel, originally only on Sundays.
Question 8:

- Which state/territory requires cars to drive on the left side of the road?
U.S. Virgin Islands
Policy Deep Dive: Electrifying the Transportation Sector

• Speaker:
  • Kathy Kinsey, Senior Manager, State Policy, American Council for an Energy Efficient Economy
Transportation Electrification

HOW STATE POLICY MAKERS CAN ACCELERATE EV ADOPTION

May 10, 2019
About NESCAUM

- An association of the air pollution control agencies of the states of CT, ME, MA, NH, NJ, NY, RI and VT formed in 1967

- Serves as a technical and policy advisor on air quality, climate and clean transportation issues and facilitator of multi-state coordinated action

- Significant focus on transportation electrification
Multi-State Initiatives

- 2013 Governors MOU
- 2014 ZEV Action Plan
- ZEV Action Plan 2018 – 2019
- 2018 Regional Infrastructure Plan
TRANSPORTATION SECTOR EMISSIONS

- Account for nearly 30% of GHG emissions
- Single largest source of GHG emissions
- 60% attributable to passenger cars and light-duty trucks
- The only sector in which GHG emissions are increasing due to increasing VMT
- A major contributor to smog-forming pollutants, particulate matter and toxic air pollutants

Sources of Greenhouse Gas Emissions in 2017

- Transportation: 29%
- Industry: 22%
- Electricity: 28%
- Commercial & Residential: 12%
- Agriculture: 9%

A Key Climate and Air Quality Strategy

- EVs two-thirds more energy efficient than gasoline and diesel powered cars
- Even with coal-fired generation, EVs produce one-third lower GHG emissions
- With managed charging, EVs facilitate grid integration of more wind and solar energy sources
- Zero tailpipe emissions means improved air quality

Source: https://afdc.energy.gov/vehicles/electric_emissions.html
Consumer Benefits

- Significant fuel savings
- On average eGallon cost of electricity is $1.13 – roughly half the cost of a gallon of regular gas
- Lower maintenance costs
- Convenience of home charging
- Performance – quiet, smooth and fun to drive
- HOV lane access
Primary Barriers to Mainstream Consumer EV Adoption

- Higher purchase price
- Lack of charging infrastructure
- Lack of awareness and understanding
- Dealership engagement
The Path Forward: Challenges and Opportunities
Purchase Incentives

- Consumer surveys demonstrate that incentives are often a determinative factor in the decision to purchase an EV – particularly for more affordable models.

- Point-of-sale rebates that provide “cash on the hood” are the most effective approach.

- A sustainable source of funding for incentives is needed to provide consumers and automakers with certainty.

- Consider increasing incentives for low-income consumers and expanding to used EVs.
Significant New Sources of Infrastructure Funding

While other investments by OEMs, EVSE providers, businesses and workplaces are expected and needed, there are three major current sources of infrastructure funding:

**APPENDIX D FUNDS**

Under the VW settlement, the states may invest up to 15% on ZEV charging and hydrogen fueling infrastructure.

**UTILITY PROPOSALS**

Pursuant to the VW settlement, Electrify America is investing $2 billion to promote ZEVs, which will include substantial infrastructure investments in the states.

Utility proposals representing an investment of more than $1 billion are approved or pending in states across the country.
THE BENEFITS OF UTILITY INVESTMENT

- Electric vehicles are a new source of needed load
- Properly managed EV charging will facilitate integration of renewable sources of energy and achieve grid operational efficiencies
- Puts downward pressure on electricity rates for all ratepayers
EV-READY BUILDING CODE STANDARDS

Relative Cost per PEV Charging Space of PEV Charging Infrastructure in New Construction vs. Retrofits (2016 dollars)

Less than half of Americans are able to name a specific EV model and make

Two-thirds of consumers surveyed in 21 U.S. cities had basic misunderstandings about the characteristics of EVs

Less than 35% of California households were aware of EV purchase incentives

DRIVE CHANGE.
DRIVE ELECTRIC.

- A joint state/industry funded brand-neutral multi-media educational campaign focused on the Northeast

- Launched in 2018

- Three target audiences

- Working to attract new funding partners
GOVERNMENT LEAD-BY-EXAMPLE INITIATIVES

ELECTRIFY PUBLIC SECTOR FLEETS

• Set light-duty fleet electrification targets
• Implement vehicle procurement policies that promote acquisition of EVs using a TCO analysis
• Make government EVs visible to the public using decals or special license plates
• Set targets for electrification of transit buses
• Provide workplace charging for government employees
• Develop award/recognition programs for leading agencies and private sector businesses
Multi-State Initiatives

2013
Governors MOU

2014
ZEV Action Plan

2018 Updated
ZEV Action Plan

2018 Regional
Infrastructure Plan
What State Policy Makers Can Do to Accelerate EV Adoption

• Adopt financial and non-financial incentives for vehicles and infrastructure
• Leverage state VW Appendix D funds for EVs and charging/fueling infrastructure
• Support utility investment in charging infrastructure, consumer outreach programs, and innovative pilot demonstration projects
• Invest in consumer outreach initiatives
• Adopt EV-ready building codes and MUD right-to-charge laws
• Electrify government fleets and transit buses by setting fleet and bus electrification targets and updating procurement policies
• Provide workplace charging for government employees and recognition programs for leading agencies and private sector businesses
• Collaborate with other states and local governments
Kathy M. Kinsey
Senior Policy Advisor
240-608-5954
kkinsey@nescaum.org
Bootcamp Wrap-Up

Dan Lauf, National Governors Association

#WeTheStates
Wrap-up Questions

• During this last session, state participants will be asked to answer the following three questions:

1. What did you hear over the last two days that resonated?
2. What are your top priorities and what do you hope to accomplish in your first year?
3. How can NGA support you in your role?
New Energy Policy Advisors Bootcamp
May 9 - 10, 2019
National Governors Association Center for Best Practices
WIFI Network:
Password:
#WeTheStates