

**2025 Minnesota Energy Planning Project  
Stakeholder Advisory Committee Meeting #1  
July 30, 2015**

**Goals of the meeting:**

1. Introduce the project
2. Make progress toward determining the most important energy technologies and strategies for Minnesota to focus on in the next ten years.
3. Gather input on baseline indicators and criteria for selecting progress indicators that will help gauge progress in implementing the technologies and strategies over time.

**Stakeholders:** Adeel Lari (Center for Transportation Studies), Zack Hansen (Ramsey County), Justin Kaster (2100 Advisors), Joe Drapeau (New Flyer), Kevin Schwain (Xcel Energy), David Hughes (Target), Ben Gerber (MN Chamber of Commerce), Audrey Partridge (CenterPoint Energy), Ken Geisler (Siemens), Ryan Hentges (Minnesota Valley Electric Cooperative), Lissa Pawlisch (Clean Energy Resource Teams), Jeff Haase (Great River Energy), Jason Edens (Rural Renewable Energy Alliance), Joe Houseman (Wellington Management), Richard Graves (Center for Sustainable Building Research), Scott Norquist (3M), Sheri Brezinka (US Green Building Council), Jamie Fitzke (Center for Energy and Environment), Annie Perkins (Andersen Corporation), Ken Smith (Ever Green Energy), Dave Chura (MN Power), Katie Fernholz (Dovetail Partners), Brendon Slotterback (City of Minneapolis), Bob Jagusch (MN Municipal Utilities Association), Gina Gore (City of Woodbury), Jodi Slick (Ecolibrium3), Holly Lahd (Fresh Energy), Jen Hassebroek (City of Oakdale)

**Observers:** Anna Henderson (Environmental Quality Board), Will Seuffert (Environmental Quality Board), Fritz Ebinger (Clean Energy Resource Teams), Bob Patton (MN Dept. of Agriculture), Mark Lindquist (MN Dept. of Natural Resources), Lisa Hughes (MN Dept. of Employment and Economic Development), David Thornton (MN Pollution Control Agency), Frank Kohlasch (MN Pollution Control Agency), Anne Claflin (MN Pollution Control Agency), Jason Willett (Metropolitan Council), Thor Underahl (MN Power), Barb Jacobs (MN Senate), Hannah Pallmeyer (MN Senate), Sarah Russell (Target), Philip Shaffner (MN Dept. of Transportation), Andrew Bahn (MN Public Utilities Commission), Chris Villarreal (MN Public Utilities Commission), JB Matthews (Cushman Northmarq), Chase Taylor (Dovetail Partners)

**Project Staff:** Lise Trudeau (MN Dept. of Commerce), Annie Levenson-Falk (Legislative Energy Commission), Michelle Gransee (MN Dept. of Commerce), Anthony Fryer (MN Dept. of Commerce), Jessica Burdette (MN Dept. of Commerce), Brendan Jordan (Great Plains Institute), Lola Schoenrich (Great Plains Institute), Amanda Bilek (Great Plains Institute), Amira Hamdon (Great Plains Institute), Erik Fowler (Rocky Mountain Institute), Christa Owens (Rocky Mountain Institute), Becky Alexander (LHB), Rick Carter (LHB), Matt Schuerger (Energy Systems Consulting), Matt Prorok (Legislative Energy Commission)

**Agenda and Meeting Notes**

12:15 Working lunch - Welcome from Representative Pat Garofalo, Senator John Marty and Assistant Commissioner Bill Grant

**12:25 Overview of 2025 Minnesota Energy Planning Project** – Annie Levenson-Falk, Legislative Energy Commission

- Project purpose is to recommend next steps to leverage near-term opportunities for a clean, affordable, reliable, and resilient energy system. Project will develop action

plans to advance a number of strategies and technologies for clean, efficient energy between now and 2025.

- Project deliverables will include baseline metrics, outcome indicators, and action plans to advance technologies and/or strategies.
- Project is staffed by MN Department of Commerce, Legislative Energy Commissioner, Rocky Mountain Institute, Great Plains Institute and LHB. Additional project support from U.S. Department of Energy, Energy Systems Consulting Services, Clean Energy Resource Teams, and MN Pollution Control Agency.

**12:45 Overview of the Stakeholder Advisory Committee** – Brendan Jordan, Great Plains Institute

- Role of the advisory committee is to provide input in order to prioritize key technologies and strategies, identify energy indicators, and help develop action plans.
- Stakeholders will also have a role in helping to implement action plans. Stakeholder involvement provides the foundation for future implementation activities.
- Process observers are interested in tracking the progress of the project and will be given opportunities to offer verbal input at meetings and can provide written comments to project staff, if they choose.

**12:55 Overview of Minnesota’s current energy system and policy framework** - Becky Alexander, LHB, Inc.

- Presentation slides are available [here](#).

*Discussion notes:*

- Comparing to the US is not useful without weather-normalization
- How much did it cost to get to the current levels?
- How much would it cost to not make changes?
- Weather-normalization is important to compare to ourselves over time (especially for heating fuels)
- It would be helpful to know the reasons for the GHG trends in slide 27
- Provide the breakdown between vehicle types in the transportation sector GHG trends
- Trip distances
- Where has the energy efficiency and renewable energy work been focused to date (e.g. which geographic areas, which types of building stock)? Make sure the data is consistently and accurately attributing energy and emissions to the appropriate sectors (e.g. electricity generation vs. end use sector). What impact are utilities having compared to businesses and residences?
- Emissions per GDP
- Flow diagram for emissions
- Energy per capita by fuel source (compared to U.S. average to indicate heating demand)
- Reason for decrease in VMT related to demographic change (increase in older people and millennials = less driving)

**1:20 Small group discussions - Round One**

Group 1: Mobility Transportation and Fuels

*Top Strategies*

1. Modernizing parking infrastructure policy to reduce VMT (3)

2. Regionally coordinated mass transit (3)
3. Production of advanced biofuels (2)
4. Increased adoption of PEVS (2)
5. City Corporate fleet adoption to alternate/ low emission fuel vehicles (1)
6. Ensure PEV charging is clean (0)

Added Options:

- Electrification of mass transit (2)
- Densify land use (1)
- Promote telecommuting (1)
- More bike adoption (1)
- Alternative to car ownership (1)
- Capture Organics from waste for AD for use as biofuel (1)
- Self-driving cars/ buses (0)

*Discussion notes:*

- The best strategy is to reduce vehicles miles travelled (VMT), the best “rides” are the ones that don’t exist. Telecommuting is a great alternative. The strategy should focus on eliminating trips. The cars off the road travelling to work are of great benefit, relieve congestion.
- The metric is to reduce VMT- how to focus the policies to target the 45 mile commuters and not the 5 mile commuters.
- Mass transit doesn’t make as big of a difference in decreasing VMT and trips because you need to follow behavior trends. The personal vehicle is a behavior that could aggregate into a larger overall impact on decreased VMT.
- EV adoption and EV charging could be grouped together. However, EV adoption is consumer based downstream, and the EV charging focuses on supply side at utilities.
- The electrification of public transit has benefits for emission, but also maintenance. There is the possibility to use existing infrastructure. Need an LCA.
- Electrification could address consumes that won’t use mass transit.
- Fleets can be grouped into electrification.
- Self-Driving Car- the model of transportation could change. Maybe it will modernize to a point where the ownership structure changes to eliminate public transit.
- For advanced biofuels, need to include anaerobic digestion. Can gain benefits beyond GHG reduction. Separate organics from waste.
- In 10 years will have commercial operations of advanced biofuel production.

Group 2: Energy Supply & Grid Modernization

*Top Strategies*

Integrated grid

1. DER management
  - a. Forecasting and analytics
  - b. Coordination of resources
2. DER resources
  - a. Supply-side efficiency (CVR)
  - b. Demand response

- c. Coordination with major uses
    - i. CHP and water treatment and distribution
  - d. Distributed generation
  - e. Storage
3. Pricing and business models

*Discussion notes:*

- How do you engage the consumer through modernized grid?
- Look at broader scheme – define resilience and what the trade-off is.
- Don't have goals around resilience or reliability. Focusing on resilience may detract for efficiency, for instance.
- Need regulatory and business model that align with our definition of resilience.
- \*For action plan - define resilience and how it plays role in broader energy goals.
- Distributed renewables and thermal: Biodigesters and CHP
- Overall open source environment to control – grid situational awareness from resilience and economic perspective
- Overall system to manage all of these together in the most economic way
- Integrated grid – centralized system linked with markets
- Advanced forecasting capabilities for demand and supply

Group 3: Buildings and Energy Efficiency

*Top Strategies*

1. Behavioral strategies in building operation
  - a. More analysis on whether existing strategies are working, more data
  - b. Determine what would work better to improve programs and persistence in savings (illume study)
  - c. Green leases with energy budgets
  - d. Incentives to value reduction/social cost of carbon
  - e. SB 2030 districts
  - f. Building energy use disclosure when you sell the building
2. Distributed Generation in and on buildings and other facilities (CHP, solar PV)
  - a. Need better regulatory framework (eg. incorporating CHP into CIP/utility cost-effectiveness framework)
  - b. Financing
  - c. More uniformity between utilities on interconnection of electric DG (solar PV, CHP)
  - Scale EE in new buildings → **1<sup>st</sup> group** had doubts on potential, but **2<sup>nd</sup> group** found some data indicating potential.

*Discussion notes:*

Reactions to survey results:

- Generally - Concerns with survey approach. Can't glean context from survey questions. Hard to rank items in isolation. Prefer analytical approach: do what the data says will work best.
- Deploy CHP - Needs context. Good for large scale purposes.
- Deploy ground source heat - Very efficient but limited by space and has to be done on the front end of building development.

- Promote innovative behavioral efficiency programs - Strong support from group (in combination with other approaches).
- Greatly expand EE retrofitting in existing buildings - Good overall. Depends what is being done. Retrofitting very broad. Combine with behavioral programs.
- Deploy solar thermal technology - Not cost-effective compared to solar pv
  - No market for solar thermal at this time
  - Changed to solar PV generally
- Zero Net Energy (ZNE) – added
  - Should be priority for new construction
- Increase building efficiency standards

Suggested alternative framework:

- Scale EE in new buildings
- Scale EE in existing buildings
- Behavioral strategies, including building operations (
- DG on and in buildings
- Integrate buildings with advanced grid interaction - At some point, ZNE will not be enough.

#### Group 4: Industry and Agriculture

##### *Top Strategies*

1. Deploy combined heat and power (CHP) (not limited to industry) (4)
2. Commercialize advanced biofuel production & biobased chemicals (3)
  - a. Should have biofuels and chemicals together – production of both at same facility improves project economics.
3. Capture organic feedstocks (ag, food processing, crops, residential and commercial food waste) through AD (2)
4. Deploy end-use efficiency in industrial settings (1)

##### *Discussion notes:*

- Think about these strategies under both the framework of meeting Minnesota's energy and climate goals, and also establishing Minnesota as a global leader that attracts new jobs, talent, and large federal grants.
- Don't consider these strategies in isolation. Integration is essential.
- Minnesota's strength is as a provider of solutions, not technologies.
- It would be helpful to know the current top implementation of each of these strategies.
- DOC has already done a lot of work on evaluating the technical and economic potential of CHP – there is a strong foundation to build on here.
- Minnesota has the ability to be a leader in biochemical research and development, and has the feedstocks available.
  - Missing financial investors, risk capital and need to build out the talent pipeline. Consistent state policy can help to address this.
- Challenge in making anaerobic digestion standard practice for organic feedstock management. There are a lot of opportunities for increased deployment of anaerobic digestion given MN's large food and agricultural processing industry.

#### Group 5: Energy & Climate Planning and Action

### *Top Strategies*

1. Local government energy and climate planning and action (3)
2. State-level planning on energy and climate (3)
3. Planning and action to increase resilience to climate change (2)
4. Reform the electric utility business model (2)
5. Comprehensive, long-term financing/funding (2)

### *Discussion notes:*

- Local government energy and climate planning and action – what does success look like? Cities plan for climate just like transportation, storm water, economic development, etc. Energy infrastructure planning is coordinated with all city planning. Local communities are energy literate.
- State-level planning on energy and climate – what does success look like? Results are actually use and state planning process with regular updates.
- Planning and action to increase resilience to climate change.
- What does “resilience” mean? Is it just dealing with the consequences of climate change, or does it include prevention? Cities need better understanding of what would happen in a disaster

2:15 Break

### **2:30 Small group discussions - Round Two**

#### Group 1: Mobility Transportation and Fuels

### *Top Strategies*

1. Modernizing parking infrastructure policy to reduce VMT (2)
2. Ensure PEV charging is clean (2)
3. City Corporate fleet adoption to alternate/ low emission fuel vehicles (1)
4. Increased adoption of PEVS (1)
5. Regionally coordinated mass transit (1)
6. Production of advanced biofuels (0)

### Added Options:

- Transportation pricing, including congestion, pollution, land use (3)
- EVS for autonomous vehicles as DR (2)
- EVS as demand response tech (0)
- Pay as you drive insurance (0)
- Regional rail (0)
- Autonomous vehicles for VMT reduction (0)

### *Discussion notes:*

- Goal is VMT reduction
- Great to see electric vehicles as part of demand response, integrated into the electric grid.
- Making EVs an “easy choice” with more accessible information. What’s the threshold of EV adoption to reduce costs in manufacturing?
- Make EV charging clean and cost effective for people

- EVs for autonomous vehicles as demand response: If you want to control supply and even out peaks but using storage. Think of electric vehicles as the storage unit, but would not have to deal with the behavior of people (unpredictable). If there was a third party owning all the autonomous vehicles it could predictably control this storage
- Transportation pricing: what are the externality pricing- external land use, pollution, congestion?
- Pay as you go insurance mechanisms – only a small change. Will not be significant or immediate enough.
- Pricing on congestion impacts (where should these apply? Just highways, local roads, downtown only?) This should be scaled for the whole region)
- Environmental externalities need to be priced: air quality and carbon impacts
- VMT Pricing
- Exploring distributional impacts such as social justice issues: impacts on access (do you have to have a gadget in your car, is that accessible)

## Group 2: Energy Supply & Grid Modernization

### *Top Strategies*

1. Communication and metering infrastructure
  - a. Smart inverters and smart meters
  - b. Two-way communication
2. Distributed generation
3. Energy storage
4. Pricing mechanisms and tariffs
  - a. Green tariffs
  - b. Equity for customers
  - c. More customer options

### *Discussion Notes:*

- More freedom for customers to influence what kind of DG they have
- Changing business models/pricing/tariffs and implications on equity and environmental justice
- Energy storage
  - Smart meters
- Economic tariffs
  - Bidirectional communication – beyond smart meters
- Green tariffs
- Pricing mechanisms – peak power pricing
- Resilience
- Microgrids
  - Storage, CHP
  - Bidirectional communication
- Grid impact on electrification of vehicles
  - CO2 impacts
  - Storage and dispatch
- Integration of communications and management
  - Peak management
- Grid intelligence
  - All the way to the customer-level
- Pricing mechanisms
  - Adapting tariffs to accommodate DERs
  - Rates for customers – TOU, residential demand charges
- Demand response
  - Demand reduction strategies – diesel generators not cleaner
  - Solar + storage

### Group 3: Buildings and Energy Efficiency

#### *Top Strategies*

1. Scale EE in existing building
    - a. Seek out underserved markets
      - i. Small commercial
      - ii. Multifamily
      - iii. Agricultural
      - iv. Mid-sized industrial
    - b. Increase use of automation and controls
    - c. Better access to data and incentives to keep it/use it
    - d. Focus on electric v. whole building
  2. Behavioral strategies in building operation
    - a. Time of use rates/other rate structures
    - b. O & M
  3. Distributed Generation in and on buildings and other facilities (CHP, solar PV)
    - a. Add renewable thermal and CHP on buildings or other facilities
    - b. Waste heat capture
    - c. Reduce water usage (energy/water nexus)
    - d. Integrate buildings with an advanced grid (thermal and electric)
- Scale EE in new buildings → **1<sup>st</sup> group** had doubts on potential, but **2<sup>nd</sup> group** found some data indicating potential.

#### *Discussion notes:*

Reaction to the alternative framework proposed by group 1:

- Scale EE in new buildings
  - Important to know that there will be huge influx of new buildings in next 10-15 years. Important not to forget. Data presented on new v. existing buildings in next 10-20 years (Architecture 2030)
  - Delta between existing code and reduction potential
  - What is needed to meet state climate goals?
  - Consider durability – Occupant usage and manufacturing of components
  - Salvage materials
  - Market characterization studies
- Scale EE in existing buildings
- Behavioral strategies, including building operations
- DG on and in buildings – Includes CHP
  - Add renewable thermal and CHP on buildings or other facilities
  - Integrate buildings with advanced electric and thermal grid interaction

### Group 4: Industry and Agriculture

#### *Top Strategies*

1. Commercialize advanced biofuel production & biobased chemicals (3)
2. Deploy combined heat and power (CHP) (2)
3. Deploy end-use energy efficiency in industrial and agriculture settings (2)

#### *Discussion notes:*

- All of the strategies need to work together.
- Consider benefits beyond energy (e.g. wastewater)



- Water distribution and wastewater treatment provides large opportunity for integrated efficiencies.
- Organic diversion to produce biogas is being looked at by various waste-to-energy private and public facilities. There are ancillary benefits in carbon, costs, water use, etc.
- Need integration of waste, energy and agriculture in order to reduce permitting barriers.
- We should be viewing CHP to include any thermal capture for productive reuse.
- Would like to see end-use efficiency include agriculture, as well as industrial settings. Examples of this in the agricultural sector can include fuel choice and efficiency for heavy agricultural equipment, increase energy efficiency of agricultural practices, reduce embodied energy of agricultural inputs, and crop selection in the energy/water nexus.
- Provide incentives to promote cost-effective products or processes. Precision agriculture is leading us in the direction of improving the efficiency of production agriculture.

### Group 5: Energy & Climate Planning and Action

#### *Top Strategies*

1. Reform the electric energy utility business and regulatory model (5 votes)
2. Cluster organization that's innovation focused (4)
3. Externality valuation system – monetized (3)
4. Broader access to renewable energy (2)
5. Corporate commitments to energy & climate (1)
6. Price of energy (1)
7. Local government incorporate energy and climate into planning, operation and activities (1)
8. Continued state-level planning on energy and climate (1)
9. New for-profit business models (1)

#### *Discussion notes:*

- Reform the electric energy utility business and regulatory model. Not just electric utilities but all energy. What success looks like?
  - Align utility interest with the public interests
  - Allow utilities to adjust to changes in energy sector and stay in business
  - Utilities interest aligned with DG, recognizing it has higher value in some places than in others
- Cluster organization that's innovation focused. What success looks like?
  - Minnesota develops a cluster of tech businesses that plays to our strengths and is traded globally
  - Attract more money to the community, including federal grants
  - Better coordinate research across private, public and non-profit
  - A nonprofit organization to drive this
- To prioritize well, need an analysis of the various strategies – what will have the biggest impacts, what are the costs? Draw on CSEO and other analyses

#### 3:15 Indicators

- Presentation slides can be found in [here](#), slides 19-23

*Discussion notes:*

- Criteria for indicator selection:
  - Adds value
  - Actionable
  - Non-duplicative
  - Holistic (not siloed)
  - Historic data available to view trends
  - Comparable to other countries
- Proposed indicators:
  - Cost efficiency of strategies
  - Benefit cost analysis of strategies
  - Carbon per unit of energy delivered
  - Socioeconomic and racial justice impacts

3:30 Opportunity for observer input

- More electric cooperatives
- More end users and need to make sure their perspective is captured.
- Include Impacts on different socio economic sectors and racial justice issues

4:00 Wrap-up comments/next steps

4:30 Adjourn