2025 Minnesota Energy Planning Project
Stakeholder Advisory Committee Meeting #2
September 22, 2015
12:00 – 4:30 p.m.
Dakota Lodge
1200 Stassen Lane, West St. Paul, MN 55118

Stakeholders:

First Name	Last Name	Company/ Organization
Nina	Axelson	Ever-Green Energy
Jeff	Beale	Honeywell Smart Grid Solutions
Bill	Black	MMUA
Sheri	Brezinka	USGBC-MN
Jenny	Edwards	CEE
Ken	Geisler	Siemens
Richard	Graves	Center for Sustainable Building Research
Jeff	Haase	Great River Energy
Bree	Halverson	Blue Green Alliance
Jennifer	Hassebroek	City of Oakdale
Justin	Kaster	2100 Advisors
Holly	Lahd	Fresh Energy
Adeel	Lari	Center for Transportation Studies, University of Minnesota
Jennifer	McLoughlin	City of Woodbury
Lissa	Pawlisch	UM Extension Regional Sustainable Development Partnerships
Sarah	Russell	Target
Kevin	Schwain	Xcel Energy
Anna	Sherman	CenterPoint Energy
Jodi	Slick	Ecolibrium3
Thor	Underdahl	Minnesota Power
Grace	Xavier	3M

Observers:

First Name	Last Name	Company/ Organization
Andrew	Bahn	PUC
Anna	Dirkswager	MN Dept. of Natural Resources
Amanda	Duerr	MN Municipal Utilities Association
Jamie	Fitzke	Center for Energy & Environment
Mike	Harley	Environmental Initiative
Anna	Henderson	Environmental Quality Board
Kevin	Hennessy	Minnesota Department of Agriculture
Richard	Hermans	Daikin Applied
Lisa	Hughes	MN DEED
Barb	Jacobs	MN Senate Energy and Environment Committee
Dan	King	Midwest Renewable Energy Tracking System
Mark	Lindquist	MN DNR
Hannah	Pallmeyer	MN Senate Energy and Environment Committee
Bob	Patton	Minnesota Department of Agriculture
John	Saxhaug	MN Environmental Quality Board

Tim	Sexton	Minnesota State DOT
Jason	Willett	Metropolitan Council
Sarah	Zaleski	U.S. Department of Energy

Staff:

First Name	Last Name	Company/ Organization
Becky	Alexander	LHB, Inc.
Amanda	Bilek	Great Plains Institute
Erik	Fowler	Rocky Mountain Institute
Anthony	Fryer	MN Department of Commerce
Amira	Hamdon	Great Plains Institute
Brendan	Jordan	Great Plains Institute
Annie	Levenson-Falk	Legislative Energy Commission
Patrick	Mathwig	Great Plains Institute
Christa	Owens	Rocky Mountain Institute
Lola	Schoenrich	Great Plains Institute
Matt	Schuerger	Energy Systems Consulting
Lise	Trudeau	MN Department of Commerce
Janet	Streff	MN Department of Commerce
Michelle	Gransee	MN Department of Commerce

Meeting Goals:

1. Come to a shared understanding of what success would look like for this project
2. Further examine the draft technologies and strategies for Mobility, Transportation, and Fuels; Energy Supply & Grid Modernization; Efficient Buildings and Thermal Energy; Industry and Agriculture; and Energy & Climate Planning and Action in light of shared criteria, additional information, and work already underway
3. Identify next steps for focusing the contents of the report and lay the groundwork to move forward to conclusions

Meeting Agenda

12:15 Welcome and Introductions

- Project overview
- Role of stakeholder advisory group and observers

12:25 Review agenda and summarize results from first meeting

- Meeting goals
- Stakeholder feedback

12:45 What does success look like for this project?

Discussion notes

- Some of the project output should make Minnesota a recognized thought leader in energy policy
- Actionable across sectors, not a report on the shelf
- Take advantage of the cross sector opportunities by looking at interdependencies across transportation, buildings etc… Have a holistic strategy that looks beyond policies that exist in silos, but this makes it difficult to identify applicable indicators. A

more holistic, integrated approach is necessary because these projects are all related.
- Teeing up how does integration work, what are the next technologies, how to avoid having similar types of conversations repetitively
- Success defined in metrics and are trackable.
- Thinking about how the energy supply and solution will tie to the business community and will support businesses.
- Push past the "standard" routine of coming up with a plan, find a metric and track it.
- Look at policies and projects and identify where are the places that markets need a nudge. What strategies could use a push from the group?
- Regular conversation with each other beyond these meetings: how to connect everyone in terms of RESOURCES, information sharing, regular distribution of information (i.e. grant information)

Draft Report Outline:
- Indicators: if project success means that the sectors are integrated, how do we ensure we have the right indicators to measure successful implementation?
- Is this project a state approach or is this going to be imbedded at the local level?
    - Strategies identified that some level of Minnesotans can run with. No distinction between state, local leaders.
- DOE funding and relation to outcome of the project- new goals could go into #5 section of report, to be included but not to make the project too diffuse- (i.e. laundry list of ideas)

Proposed criteria
- There isn't anything related to equity, vulnerable populations. Is it embedded in "climate goals" or should it be separated out? Environmental justice is important. Be careful not to narrow down to a point where we stop looking at energy poverty etc.
    - Do the state regulations to be changed- what exists takes a consumer centric view
    - If the outcome has a change to the business model, regulatory models that could be impactful- flagged for small group discussion
- What happens when one goal rivals another? (i.e. advances carbon reduction goal but hinders the energy equity/ justice goals)
    - We will look into environmental justice goals the state has-either in practice or statute.
- Idea to include a programmatic way to support research
- Funding from DOE- if there is an opportunity to complement strategy implementation with funding that would be a good direction to focus on.
- There is an element of uncertainty- are we limiting the use of future technology that has yet to be deployed. Is there space to innovate? Element of "we don't know yet what we don't know." Idea that there could be a review process every 5 or so years into the action plan.
- The future technologies and solutions are still unknown therefore does this plan leave enough space to use different technology in the future? (i.e. solar thermal example)
- Strategy as an approach to change rather than picking one technology over another.
- How do we define benefits and costs? Interested in this being fleshed out.
    - Will not have the resources for a full quantitative analysis on the strategies, we are looking for your sense of the benefits and costs based on your expertise.

- The interaction between sectors could become another small group.
    - We have a question in the small groups to address synergies across sectors that will be reported at the full group discussion.
- Additional criteria- ability to leverage additional resources?
- Helpful to call out specifically environmental justice, energy, air quality, water quality goals.
- Are we talking about criteria in a black and white assessment or prioritization? In or out- will this be coherent over integrating sectors?
    - Criteria: has potential across different sectors- should be separately articulated.
- Are these policies making our systems overall more efficient, is the system holistically becoming more efficient? Are we unintentionally creating inefficiencies through policies- looped into #3. When using knowledge of benefits and costs, really think about unintended costs in the sector or others.

Revised criteria:

1. Strategy or technology's potential impact toward current MN energy, climate, other air quality and environmental justice goals.
2. The potential for the 2025 MN Energy Policy Planning Project to move the needle on a particular strategy in the context of related projects in MN.
3. Likely benefits relative to costs.
4. Commitment by stakeholders to advancing the strategy and ability to leverage additional resources.
5. Has potential to provide benefits across sectors.

1:30 Presentation of prioritized strategies

- Recap prioritized topics from last meeting
- Synthesizing technologies/strategies
    - Minnesota resources: Department of Commerce update on regional planning resources
    - Mostly looking at tech that impacts transportation- looking into autonomous vehicles and their impacts-
    - Reiterating the importance of the synergies between sectors especially against the background of new trends that change the way we live (i.e. autonomous vehicles, internet of things, 3D printing)
    - Considerable depth on CHP but not on the other topics- CHP showed up in 3/5 groups

2:15 Small group discussions

Purpose of small group discussion is to further examine the draft technologies and strategies that represent the biggest opportunity for Minnesota over the next decade.

<u>Group # 1 Mobility, Transportation, and Fuels</u>

Was the big picture of the most important opportunities in this sector about right? If not, what should be changed, added, or deleted?

- Autonomous driving features, a lot of focus on electrification if this space progresses.
- Autonomous driving & sharing models: How does this integrate into state policy & legislation? This changes everything about how we drive, for example the individuals

may not own the cars anymore it could look like one large or many small “Car2Go” type models.
- Success needs to be realistic. What can be accomplished in statute and what is not politically palatable?
- What is the energy tie to autonomous vehicles?
    - The VMT (vehicle miles travelled) reduces when autos are shared because the ownership model changes, currently owners pay the large fixed cost and the marginal cost is cheap therefore we drive more. If the fixed cost is shared and we only pay per use it will impact behavior.
    - Parking infrastructure discussion: parking pricing, seems to be confused to how this relates to mobility or what this means.
    - Pricing seems absent. Options are technology focused whereas pricing seems like a more direct impact on reducing VMT.

Do the key 2 - 3 strategies presented in the last session still represent your best thinking about the most important technologies and/or strategies for the next decade, based on the criteria discussed earlier in the meeting? If not, what should be added or deleted?

- The last two options seem marginal therefore:
    - Electrification of mass transit
    - Electric vehicles for fleets
    - Increase adoption of EVs/AFVs
    - Pricing
    - Autonomous vehicles: how would we steer this to ensure reduced GHGs?

Where are there cross-sector or cross-initiative synergies?

- Interaction between a cleaner grid and cleaner charging
- EVs providing ancillary grid services
- Increased EV penetration good for ratepayers in Minnesota
- Communities could be impacted by having electric fleets
- Building codes for EV readiness: charging for multi-unit houses, retrofits for older homes- basically making houses EV ready

Electrification of Mass Transit (Buses)

a. What is already underway that needs aligning or could work even better if improved?
    - Light rail is underway and needs funding
    - EVs are underway but underfunded
    - Need to bring EV buses to Minneapolis

b. What is missing that is a critical element of success for this technology/strategy?
    - CTS needs to do an independent analysis of total cost of ownership
    - Financing then becomes the issue- how to fund these busses ($300 000 more per bus)
    - What are the potential drawbacks? How will this work in the winter, other practical issues
    - Two demonstrations: suburb to inner city and downtown routes.
    - What are the true environmental benefits of electrification: green tariffs for the next 20 years to power your car with wind source?
    - Data gap- lifecycle costs and benefits including carbon emissions
    - Data Indicator: Ridership on electric vehicles

c. What additional information is needed to improve this recommendation and make final decisions in December
   - Need to know lifecycle costs and benefits of electric mass transit
   - Need a plan for batteries- what do we do with them when they degrade past 50 % - end of life on batteries

d. Other:
   - Do no harm, cannot make a change that increases carbon emissions
   - Transportation is more than emissions, poverty, mobility tie ins need to be considered

Fleet Electrification

a. What is already underway that needs aligning or could work even better if improved?
   - No significant fleet investment in Minnesota that the group is aware of
   - Lifecycle cost analysis for MnDOT fleets

b. What is missing that is a critical element of success for this technology/strategy?
   - Financial barriers- conversion costs to switch
   - Pay back the state through a revolving fund
   - Indianapolis works with a company that finances fleet conversion
   - Education and behavior change- when there are EVs available in the fleet people are hesitant to chose them when they have other options
   - Financing mechanism- Need more information- How did Indianapolis do it

c. What recommendations would you make for your sector(s) to make the initiative ideas proposed more actionable?
   - Need to be able to show decision makers/ state agencies/ fleet owners that there is a cost savings here
   - Need overcome skepticism for fleet managers: tools, story, use green step cities, (use the Burnsville example)

d. What additional information is needed to improve this recommendation and make final decisions in December
   - Financing mechanism-example from Indianapolis

e. Indicators
   - Number of vehicles
   - % of vehicles that are electric
   - VMT travelled on electricity

Increase Adoption of EVs/ AFVs

a. What is already underway that needs aligning or could work even better if improved?
   - Drive Electric Minnesota

b. What is missing that is a critical element of success for this technology/strategy?
   - Multi unit housing is not set up for EV adoption
   - Retrofitting is much more expensive

c. What additional information is needed to improve this recommendation and make final decisions in December
   - What do multi unit family housing need to have to incorporate EVs?

d. Other:
   - Side view mirrors: drag on mirrors decreases efficiency
   - Energy efficiency: racks, bikes, on top of car have 20% reduction, even empty racks have 10% increase in fuel consumption

Pricing

a. What is already underway that needs aligning or could work even better if improved?

- MN have MinnPass lanes

b. What is missing that is a critical element of success for this technology/strategy?
   - Need a VMT Tax- can adjust for congestion, for weight etc…
   - Pricing for the roads- cost of service
   - One of the biggest obstacles is the privacy implications- do not want the gov't to know where they are driving

c. What recommendations would you make for your sector(s) to make the initiative ideas proposed more actionable?
   - Need to change the political perception

d. Other:
   - This is the biggest impact option but also the most difficult

Group 2: Energy Supply & Grid Modernization

Was the big picture of the most important opportunities in this sector about right? If not, what should be changed, added, or deleted?

- Customer incentive programs
- Load control = savings for everyone. Need to explain and communicate broadly
- Based on notes from last meeting, how well does this align with the national plan?
  - DOE quadrennial report could be useful to cross-reference
- Green power options – community solar not highlighted but has been a big thing; with community solar and a lot of these programs, there's a softer element of, how do you provide visualization of these programs to the end consumers?
  - How do you appropriately provide information about the impact of community solar or TOU rate to consumers?
  - Move from technology focus to behavior, providing appropriate evidence to consumers that this provides benefit to consumers
- Utility moving toward more consumer/prosumer model; business models changing
- Community solar program– addresses issue of installation quality, proper equipment, reliability
- What constitutes a strategy? Last conversation very technically focused, but now we should think of technical pieces as elements of a strategy
- How do we apply technologies into a community setting and evaluate what we want to do?
- Pricing and business models – need to flesh this out; third-party aggregators not allowed – is that the right call?
- Green tariffs – Policymakers interested in this conversation; increasing demand by large businesses to have access to products and services from their utilities that they were not getting elsewhere
  - Strategy seems vague, though – need to flesh out more
  - Big institutional users (like Macalester) pledging to buy all electricity through community solar
  - Opportunities across sectors; green tariffs could supply new load for electric buses, for instance
- How do you incent creation of different resources, balance variability at distribution level, and keep rates low?
- Tangibility of value for consumer and utility; shifting load from x to y
  - Changing load profile, better utilizing the assets and system, and driving down costs for everyone
  - In wholesale contracts, have rate design attributable to generation assets. Wholesale rate design and market often act independently.
- Drivers include top-down (policy goals) and bottom-up (customer demand)

- Energy-balancing and flexibility throughout the system
- Minnesota on track to meet/exceed RPS
    - Averages can hide a lot of things; for instance, wind production low in the summer, when we use a lot of energy; ability to balance annual variability
    - MRITS report found that 40-50% renewables could be integrated; grid sufficiently strong to accommodate this variability

Where are there cross-sector or cross-initiative synergies?

- Coordinate between water and electric utilities
- Light rail – can adjust rate of acceleration at peak times
- Commercial buildings and strip malls – utilities don't know how to access
- Efficient buildings + DR – rate design and bundling of services
- Energy improvement zones – city zoning requires participation in DR
- Consumer education: access to information and visualize – energy consumption, CO2 emissions, TOU, DR
- Community planning and programs

Group 3: Efficient Buildings and Thermal Energy

Was the big picture of the most important opportunities in this sector about right? If not, what should be changed, added, or deleted?

- New Buildings - Adoption of SB 2030 as a stretch code – Inclusion in code appendix is being explored
    - Building stock turnover rates around 1% (according to RMI)
    - Energy codes have the ability to influence attitudes and increase prevalence of building efficiency techniques
    - Move to performance based codes
- Existing buildings – Many different approaches for scaling EE. New ASHRAE standards for existing buildings.
- EE and DR together – Leveraging "wow factor" of smart grid tools to ensure the basics of EE are being achieved
- DG and CHP opportunity - Difficult to define opportunity (no cookie cutter approach)
- Wastewater energy recovery – 3 pilot programs currently in US. Emerging opportunity.
- Current programs - What current program evaluation information is available – CIP reports, ACEEE might have top 10 programs.
- Persistence of savings – Occupants gradually devolving back to previous inefficient habits or equipment.
- Beyond buildings – Approaches that consider building interaction with other buildings.
- We should consider technological strategies that could be implemented in MN but are currently only implemented overseas or in other states. What are the barriers?
- How do we get past ease of use trends? Building techniques currently used that inherently limit efficiency (magic packs).
- Supply side efficiency – Improving efficiency in the generation and delivery of energy
- Increase benchmarking and disclosure requirements – Beyond public buildings and Minneapolis

- Leveraging big data – i.e. Weather data being incorporated automatically into smart thermostats
- EUI – Can EUI be implemented into programs beyond benchmarking?

Next steps:
- Jeff (Honeywell) - Executive summary of combining EE and DR. Leveraging the cool… For retail and commercial
- Anna Dirkswager – Will send info on renewable thermal energy initiative idea

Do the key 2 - 3 strategies presented in the last session still represent your best thinking about the most important technologies and/or strategies for the next decade, based on the criteria discussed earlier in the meeting? If not, what should be added or deleted?
Revised list of priorities:
- Benchmarking and disclosure
- Scale EE in existing buildings
- Renewable thermal projects (pilot)
- Pilot behavioral strategies
- Ensure perseverance of savings
- Support DG and CHP
- Combined DR and EE offering for certain sectors
- Analysis of current programs
- Move to performance based new construction codes
- Zero or low energy goals for new code
- Advanced grid/thermal grid

Where are there cross-sector or cross-initiative synergies?
- Zero/low energy goals and the impact on the grid
- Building energy use and EV

Group 5: Energy & Climate Planning and Action
Was the big picture of the most important opportunities in this sector about right? If not, what should be changed, added, or deleted?
- Generally the listed opportunities are right.
- To be effective, the strategies in this sector (especially the planning strategies) need to close the gap between planning and implementation.
- Think about addressing utilities that aren't controlled by other efforts.
- Address workforce needs associated with each strategy
- Consider economic effects on lower income residents (i.e. strategies that affect price of energy)
- It would be difficult to create a statewide energy plan that is specific enough to be meaningful.

Do the key 2 - 3 strategies presented in the last session still represent your best thinking about the most important technologies and/or strategies for the next decade, based on the criteria discussed earlier in the meeting? If not, what should be added or deleted?
- Rename "Start clean-tech cluster organization" to "Start advanced energy cluster organization." This option includes implementation facilitation (e.g. find funding and help facilitate pilot projects).

Where are there cross-sector or cross-initiative synergies?

- Utility model reform overlaps with the energy supply sector.
- Cluster development will provide a platform for private sector innovation in all areas (e.g. agriculture, industry, energy supply, energy efficiency). The resulting economic development is multi-sector.

Advanced energy cluster organization

This strategy involves the creation of an organization that has its finger on the pulse, and is the connective glue between all stakeholders. It would be responsible for keeping in touch with funding opportunities and job potential, pulling initiatives out of the Valley of Death for reports, and make business out of policy. It provides a way to connect to the business side (not just the sustainability side) of corporations. The key strengths of this strategy are that it is actionable and it builds a framework for the future without limiting innovation.

a. What is already underway that needs aligning or could work even better if improved?
   - Minnesota's culture is supportive of pilots.
   - Minnesota has expertise in advanced energy topics.
   - National and international funding is available for the type of work we want to do.

b. What is missing that is a critical element of success for this technology/strategy?
   - There is a gap between plans and implementation, due to different players, different funding sources.
   - Grants (e.g. from DOE) are available, but we need an organization with a network that is ready to coordinate a response to these opportunities.
   - Experts are currently siloed within their sectors and don't have time to keep up with the big picture. We need an organization that keeps up with current events, understands the synergies between sectors, and knows which partners would bring value to a project.

c. What recommendations would you make for your sector(s) to make the initiative ideas proposed more actionable?
   - Get industry involved from beginning (to reduce top down mandates and increase buy-in)
   - Start something. Define the minimum viable product and then deliver it. People don't understand what you are doing until you just do something.
   - Involve the right people:
     - Doers (decision makers with budgetary control)
     - State partner as a funding source (someone that will encourage bipartisan support). Limit government involvement in implementation.
     - Corporations
     - Chamber of Commerce
     - High-Tech Association
     - Unions to address training of workforce, what economy looks like, how cluster affects rural communities (e.g. AFLICO, Building Trades Council)
     - Local governments as partner that provides site for pilot project. Add value to city (e.g. economic development) without asking for a lot of work.
     - Food sector (corporate involvement, grant opportunities)
   - Utilities want the idea to be implemented, but don't want the costs to come from utility sales

- Interview corporations on Internet of Things strategy; what can cluster organization do to help?

d. What additional information is needed to improve this recommendation and make final decisions in December?
   - Case Studies of successful clusters. Look at advanced energy clusters in other states (e.g. Chicago Clean Energy Trust, Milwaukee Water Council), as well as other sector clusters in Minnesota (e.g. medical devices). Also look at Michael Porter's advice for cluster development. Send these to group for feedback prior to Stakeholder Meeting 3.
     - What resources are needed to start a cluster?
     - How are they structured/financed? (Non-profit, B-corporation, etc.)
     - What are best practices?
   - Identify what Minnesota is well-positioned to do that makes us competitive for national/international resources (e.g. cold climate energy efficiency research)

e. Are there particular indicators that come to mind for this technology/strategy?
   - Number of projects launched
   - Number of industry partners
   - $ of funding
   - List of people who are interested
   - Energy saved (important to attract more $)
   - GHG reduced

f. Potential outcomes of 2025 Minnesota Energy Planning project:
   - List of best practices for an advanced energy cluster organization
   - Description of next steps to take this to scale, including a first project
   - List of who should be involved

3:30 Reconvene as full group: Discussion of synergies

Group 3 Synergies
- CHP
- EVs to be plugged into the buildings

Group 2 Synergies
- AMI to provide data
- Application of data- visualization of data to consumers of emissions
- Identifying utility opportunities
- Community planning, community zones, microgrid
- Micro grids & Energy zones
  - Definition loose
  - Identified thermal grids on the building side as well
  - Economic development

Group 5 Synergies
- Being the catalyst between advanced energy cluster- need a group
- Utilities, policy makers, climate and tie in with business
- Next step is to look at best practices of other groups
  - Need to be able to attract resources
  - Leverage partner networks
  - Highlight new ideas

- Specific geographic targeting for economic development etc…

Group 1 Synergies

- Switch to cleaner EVs, a push toward EVs is tied in with a push for a cleaner grid
- EV batteries to provide ancillary services to the grid
- Electrification of fleet vehicles- tie in with community planning scaled up to state level
- Tie in with buildings, it can be a cost barrier to install a separate meter or charging infrastructure if not already provided in the house- EV ready housing

4:15 Next steps

- December 8th, Meeting #3 @ Honeywell
- Meeting #4 date changed, TBD
- CERTS will be hosting meetings, survey is circulating,
- Webinar coming up on Oct 28th- green power options
- Work on strategies and technology to have action plan
- Potentially put together technical groups in ad hoc manner

4:30 Adjourn