

# SCOPING AN ENERGY FUTURE STUDY FOR MINNESOTA

PRESENTATION TO THE LEGISLATIVE ENERGY COMMISSION  
FEBRUARY 12, 2014  
LENA HANSEN, PRINCIPAL



Rocky  
MOUNTAIN  
INSTITUTE®



# DOC RETAINED RMI TO DEVELOP THE SCOPING REPORT



ROCKY  
MOUNTAIN  
INSTITUTE®

Rocky Mountain Institute advances market-based solutions that transform global energy use. We engage businesses, communities, and institutions to cost-effectively shift to efficiency and renewables, creating a clean, prosperous, and secure energy future.





# THE CONTEXT

# 01



## LEGISLATION REQUIRED DEPARTMENT OF COMMERCE TO SCOPE AN ENERGY FUTURE STUDY

- **H.F. 729: Develop the scope for a Minnesota energy future study on how Minnesota can achieve a sustainable energy system that does not rely on the burning of fossil fuels**
- M.S. 3.8852: The Legislative Energy Commission shall develop a framework for Minnesota to transition to a renewable energy economy that ends Minnesota's contribution to greenhouse gases from burning fossil fuels within the next few decades

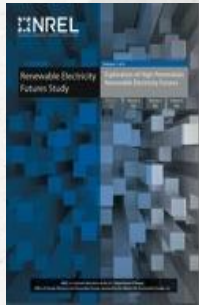


# PURPOSE OF ENERGY FUTURE STUDY SCOPING REPORT

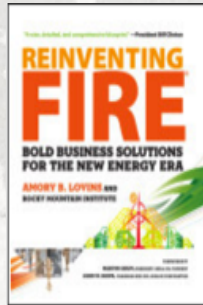
- Identify the **value proposition** for Minnesota to conduct an EFS
- Provide **clear guidance around critical study scope considerations** to ensure that Minnesota can efficiently and effectively conduct an EFS
- Provide a **foundation** from which Minnesota stakeholders and the Legislative Energy Commission can start an action-oriented dialogue around the future of energy in the state

# 10 RECENT STUDIES PROVIDED CONTEXT AND IMPORTANT INSIGHT

## United States



REFS



RF



SYNAPSE



RE-thinking 2050



Roadmap 2050



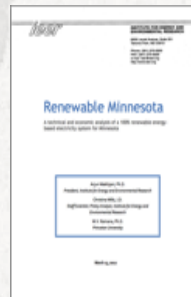
## State/Regional



Budischak et al.  
(Mid-Atlantic states)



New York



Minnesota



Vermont



# 200 MINNESOTANS PARTICIPATED IN A STAKEHOLDER MEETING AND 70 PROVIDED WRITTEN COMMENTS



**GREAT PLAINS  
INSTITUTE**



**bike.MN**



**MINNESOTA BIO-FUELS  
ASSOCIATION**

- Importance of assessing **affordability and reliability**
- Support for focusing on wide range of **commercially available technologies**, within the context of emerging tech
- Criticality of deep **stakeholder engagement** and and transparent, non-partisan process

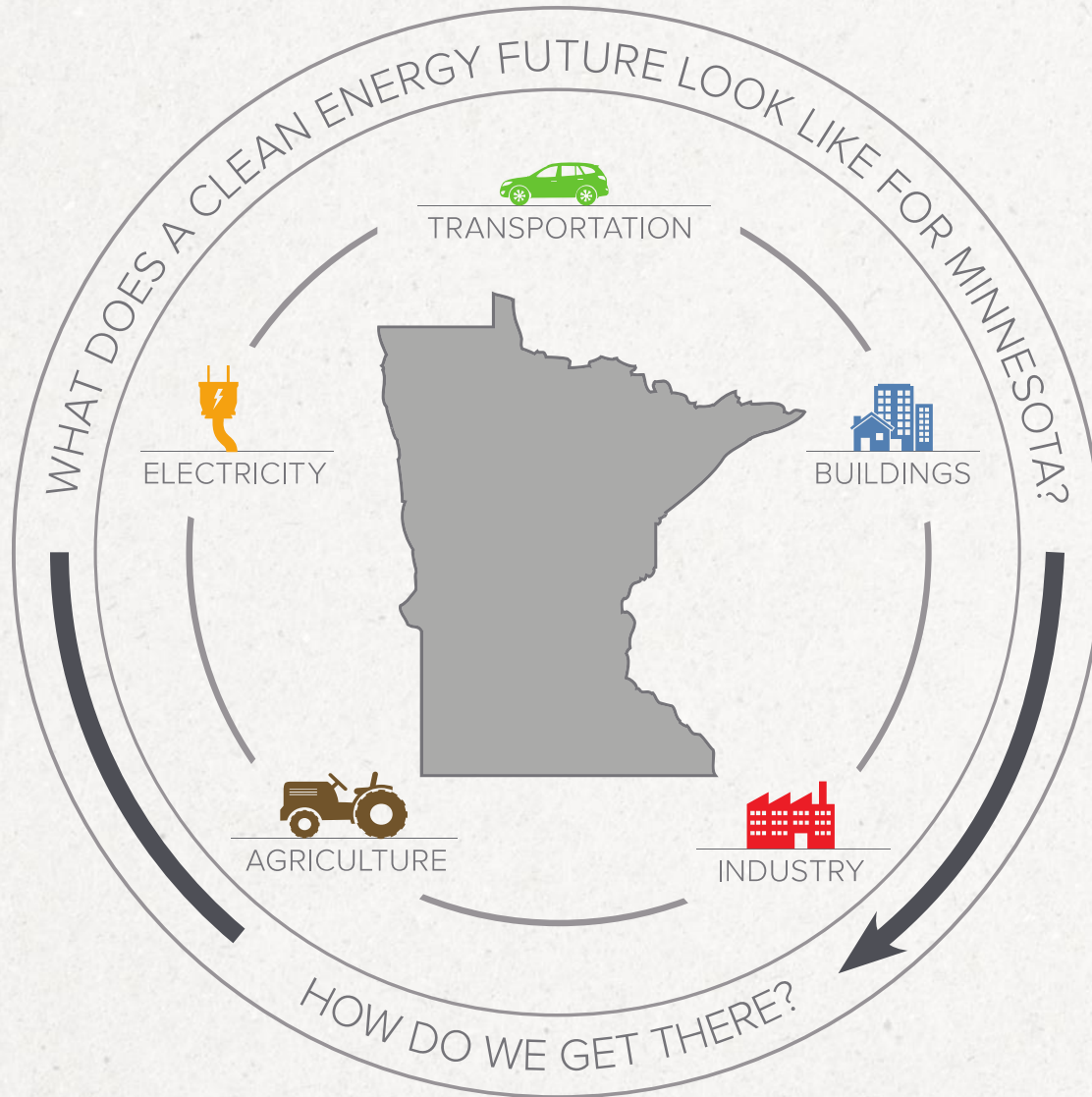
# THE POINT

# 02





# MINNESOTA'S ENERGY FUTURE IS CHOICE, NOT FATE



## THE EFS (STUDY + STAKEHOLDER PROCESS) WILL ALLOW MINNESOTA TO...

- Prepare for the future in a way that maximizes benefits and minimizes risks for the state's citizens and businesses
- Create a more predictable business environment, reveal new economic development opportunities, and meet environmental & quality of life goals
- Avoid misallocating resources, missing economic opportunities, and being overly reactive
- Engage diverse stakeholders in weighing the risks and opportunities of different paths forward
- Bring clarity and coherence to Minnesota's energy strategy, and channel efforts toward a common goal
- Recognize that there is no such thing as “doing nothing”—choices will be made, whether by default or by design



# CHANGING LANDSCAPE

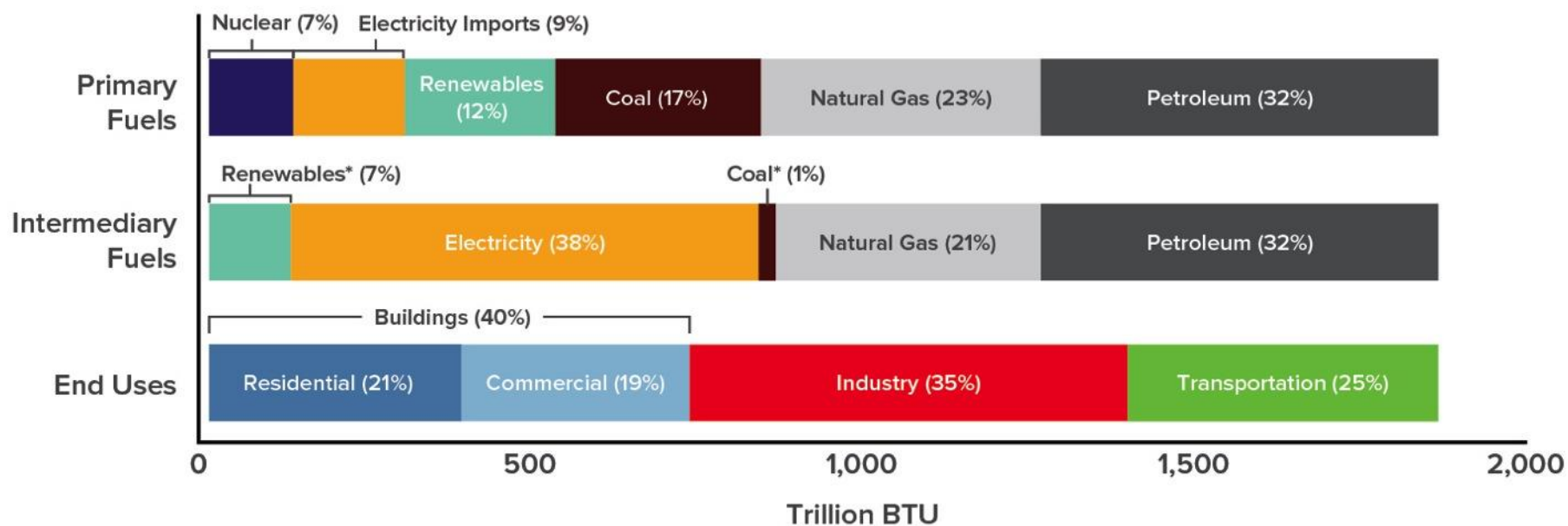
# 03





# 72% OF MINNESOTA'S ENERGY COMES FROM FOSSIL FUELS; FUELING BUILDINGS, INDUSTRY, AND TRANSPORTATION

Figure 2: Fuel Use in Minnesota, 2011





## A CHANGING ENERGY LANDSCAPE MEANS THE FUTURE WILL BE DIFFERENT THAN THE PAST...NO MATTER WHAT

- Economic development and energy independence
- A desire for increased resiliency
- Customer empowerment and competitive advantage
- Technology and price evolution
- Appropriately directing needed investment
- Shifting action on climate and environment

**\$13  
billion**  
exported  
annually for  
fossil fuels

=

53,000 teachers  
+  
9,000 police officers  
+  
30,000 small-business  
entrepreneurship loans  
+  
10,000 new affordable  
homes



# A DESIRE FOR INCREASED RESILIENCY

\$14-26 billion  
cost from  
Hurricane  
Sandy



# CUSTOMER EMPOWERMENT AND COMPETITIVE ADVANTAGE

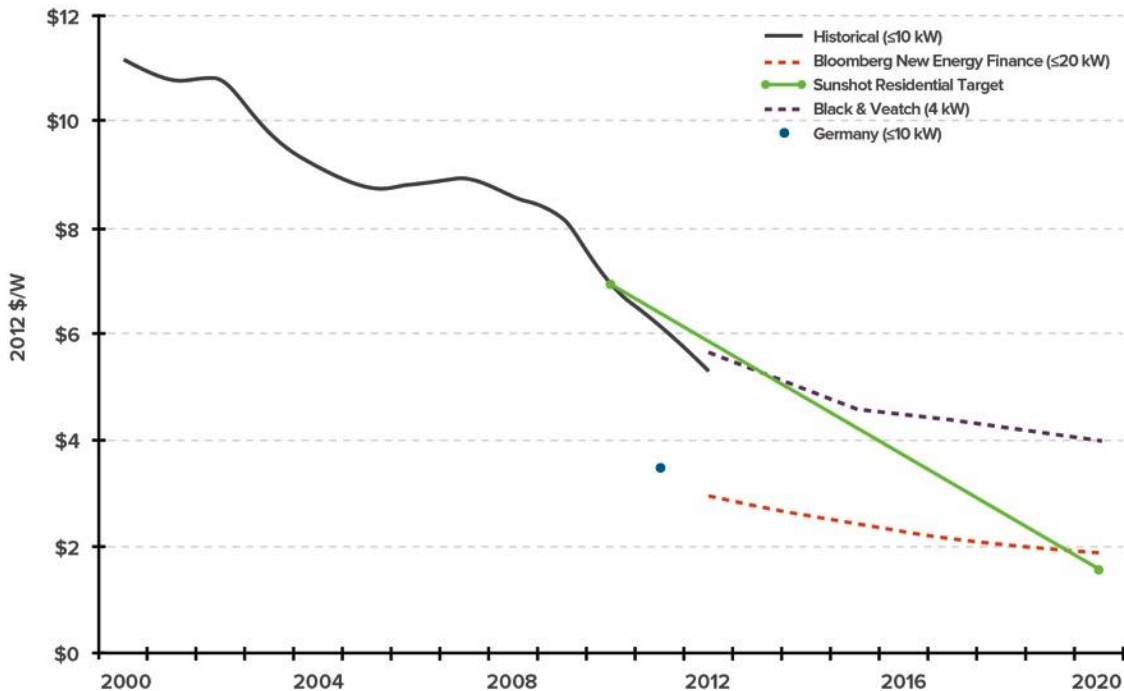
Minnesota's 5 largest companies have set GHG targets or made significant progress on GHG reductions





# TECHNOLOGY AND PRICE EVOLUTION

Figure 8: Total Installed Cost for Small PV Systems



- \$30/MWh wind, now less expensive than a 20-year natural gas contract (Xcel)
- Solar module prices down 75% since 2008
- 23% more sun than Germany (global solar leader)

# APPROPRIATELY DIRECTING NEEDED INVESTMENT

2

(both) of Minnesota's nuclear plants will retire in 2030 and 2033/34

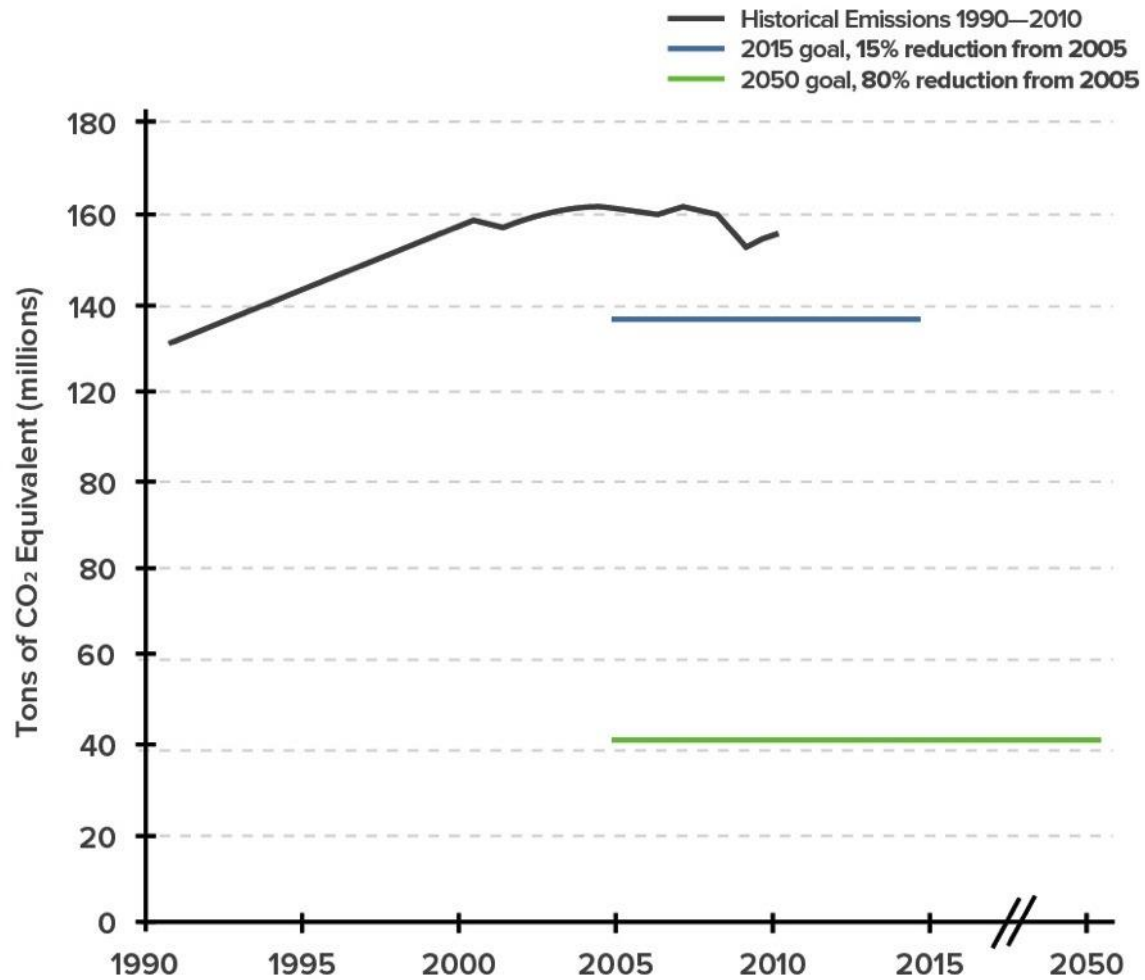
50%

of Minnesota coal plants will be more than 40 years old by 2017



# SHIFTING ACTION ON CLIMATE AND ENVIRONMENT

Figure 1: Carbon Emissions in Minnesota, 1990–2050



# THE STUDY

# 04





# KEY STUDY CONSIDERATIONS

**How far and how fast can Minnesota transition to a clean energy system while maintaining affordability and energy reliability for its citizens and businesses?**

- 80% and 100% clean energy by 2030 or 2050
- Buildings, Industry, Agriculture, Transportation, Electricity sectors
- Assess affordability, reliability, economic development, environmental quality, public health & quality of life, and risk

# KEY QUESTIONS THE EFS MUST ANSWER

- How much of Minnesota's future energy needs can be met with clean energy? In what time frame?
- Can it be done affordably?
- Could it do so while maintaining or improving reliability and resilience?
- What could be gained in terms of environmental and human health impacts?
- How might various energy future scenarios create competitive advantage and drive in-state economic development for Minnesota?
- What near-term and "no regrets" actions would set the state up for success?



# THE EFS MUST FOCUS ON WHAT, BUT ALSO HOW

## **ASSEMBLE**

Assemble the right team



## **ALIGN**

Align on objective, system definition, and analytical approach



## **ASSESS**

Assess feasibility, develop strategic vision, and build recommendations



## **ACT**

Create an ongoing process to keep the work alive

# DRIVING ACTION REQUIRES A CO-CREATIVE APPROACH

Figure 4: **Three Levels of Stakeholder Engagement**





# WHAT IT WILL TAKE

- Clarity of purpose
- Commitment to a process that doesn't just produce a study, but also drives productive action
- In-depth, diverse, and on-going stakeholder engagement
- \$1.5-2 million (opportunity for public-private partnerships?) and 12-18 months
- Adequate institutional leadership and support

Walker, there is no path  
The path is made by walking

—Antonio Machado (1875-1939)







Rocky  
MOUNTAIN  
INSTITUTE®

Creating a clean, prosperous,  
and secure energy future™