SCOPING AN ENERGY FUTURE ROADMAP FOR MINNESOTA

PRESENTATION AT SOLAR POWERING MINNESOTA
MARCH 7, 2014
ERIC MAURER, MANAGER

ROCKY MOUNTAIN INSTITUTE®

DOC RETAINED RMI TO DEVELOP THE SCOPING REPORT

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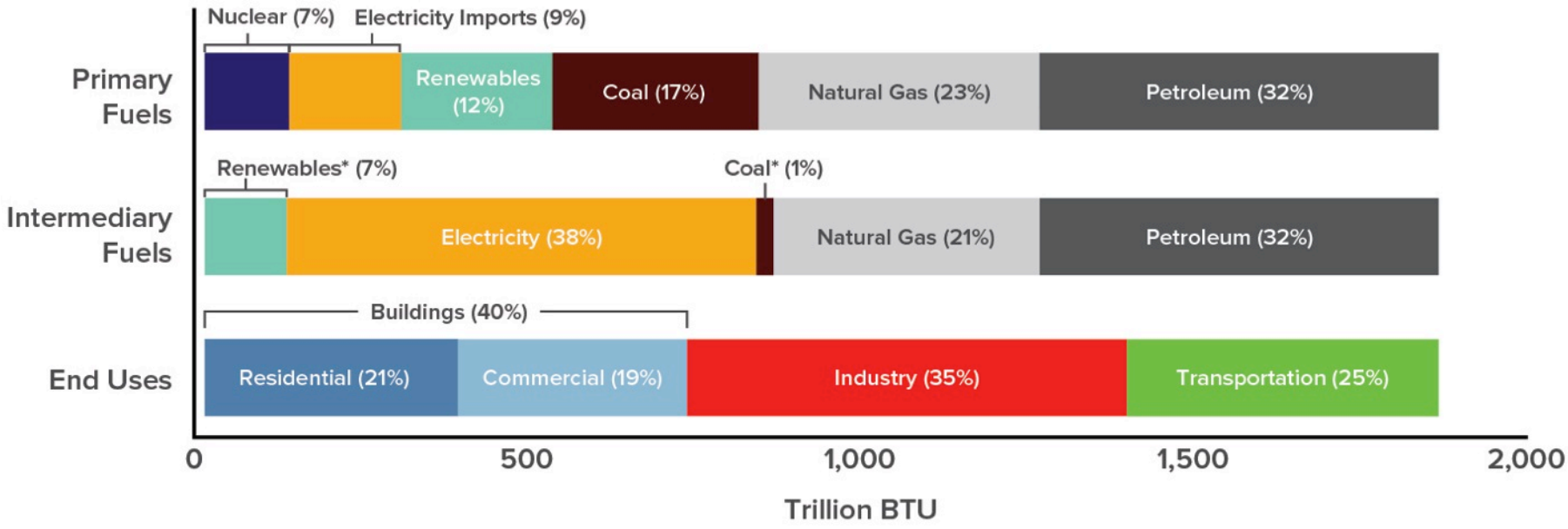
Rocky Mountain Institute advances market-based solutions that transform global energy use. We engage businesses, communities, and institutions to cost-effectively shift to efficiency and renewables, creating a clean, prosperous, and secure energy future.

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

Figure 2: **Fuel Use in Minnesota, 2011**




APPROACH
01

LEGISLATION REQUIRED DEPARTMENT OF COMMERCE TO SCOPE AN ENERGY FUTURE ROADMAP

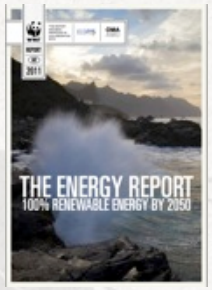
- H.F. 729: **Develop the scope for a Minnesota energy future study on how Minnesota can achieve a sustainable energy system that does not rely on the burning of fossil fuels**

- 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

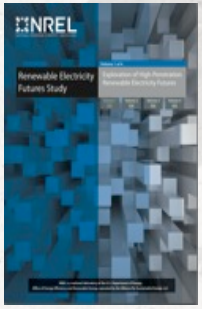
PURPOSE OF ENERGY FUTURE ROADMAP SCOPING REPORT

- Identify the **value proposition** for Minnesota to conduct an EFS
- Provide **clear guidance around critical scope considerations** to ensure that Minnesota can efficiently and effectively conduct an energy future roadmap
- 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

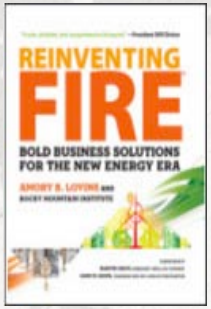
10 RECENT STUDIES PROVIDED CONTEXT AND IMPORTANT INSIGHT



United States



REFS



RF

SYNAPSE

Europe

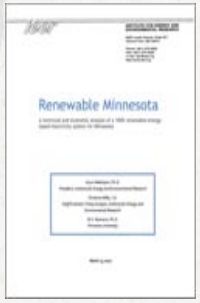
RE-thinking 2050

Roadmap 2050

State/Regional

Budischak et al.
(Mid-Atlantic states)

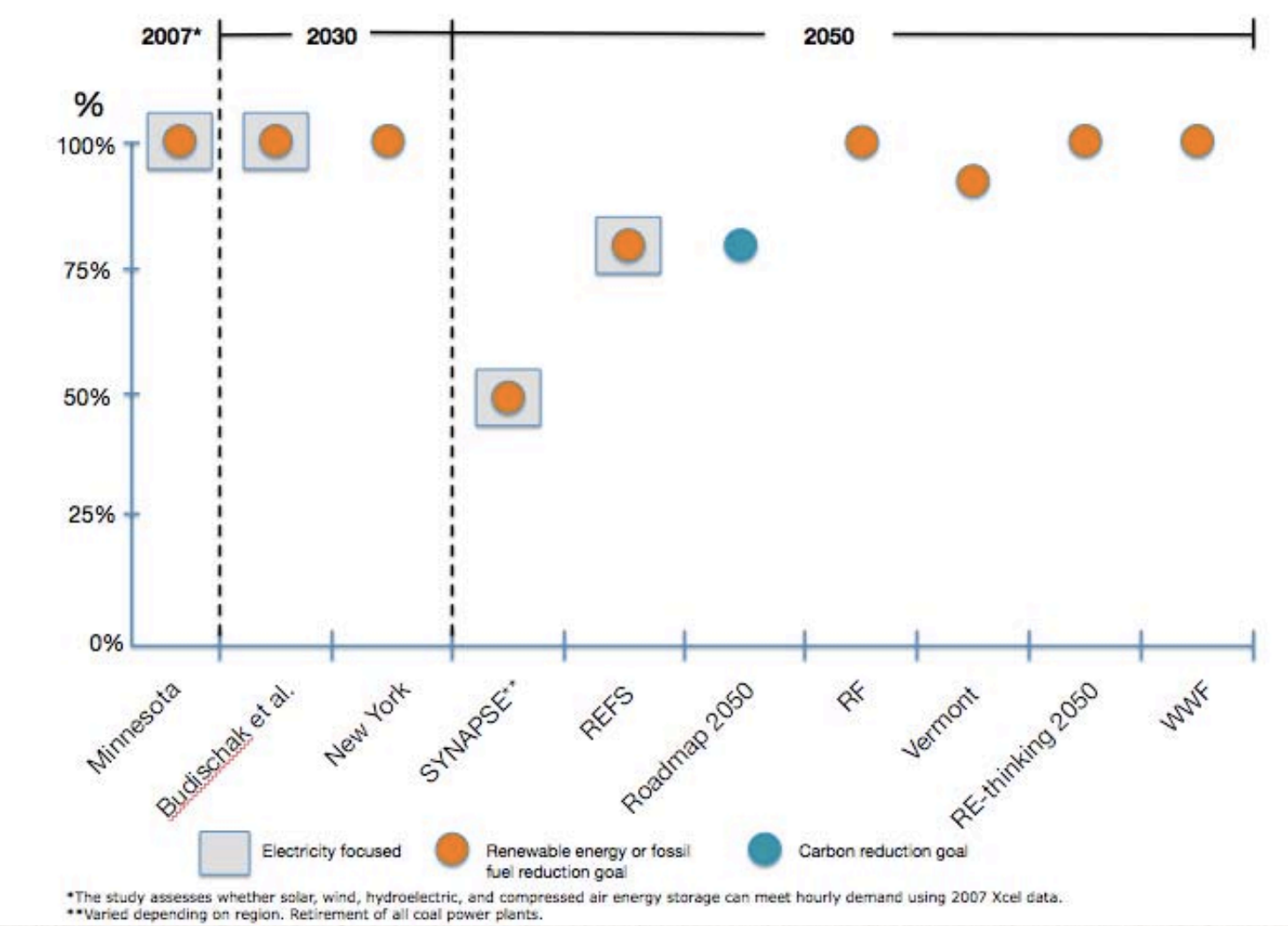
New York



Minnesota

Vermont

STUDIES FOCUS ON HIGH LEVELS OF CARBON REDUCTION OR RENEWABLE ADOPTION IN THE 2030 OR 2050 TIMEFRAME



VERMONT'S 2011 COMPREHENSIVE ENERGY PLAN

Description

- Technical cost/benefit analysis of energy future scenarios focused on electricity and energy efficiency for the State of Vermont
- Qualitatively assesses different sectors (transportation, industry, etc.) and provides wide ranging recommendations for future state actions and policy
- Recommends that 90% of energy in 2050 come from renewable sources

Key Attributes:

- Involving stakeholders
- Understanding the regional system

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

- 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 transparent, non-partisan process

THE VALUE

02

THE EFS (ROADMAP+ STAKEHOLDER PROCESS) WILL ALLOW MINNESOTA TO…

- Recognize that there is no such thing as “doing nothing”—choices will be made, whether by default or by design
- 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
- 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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CHANGING
LANDSCAPE
03

ECONOMIC DEVELOPMENT AND ENERGY INDEPENDENCE

$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

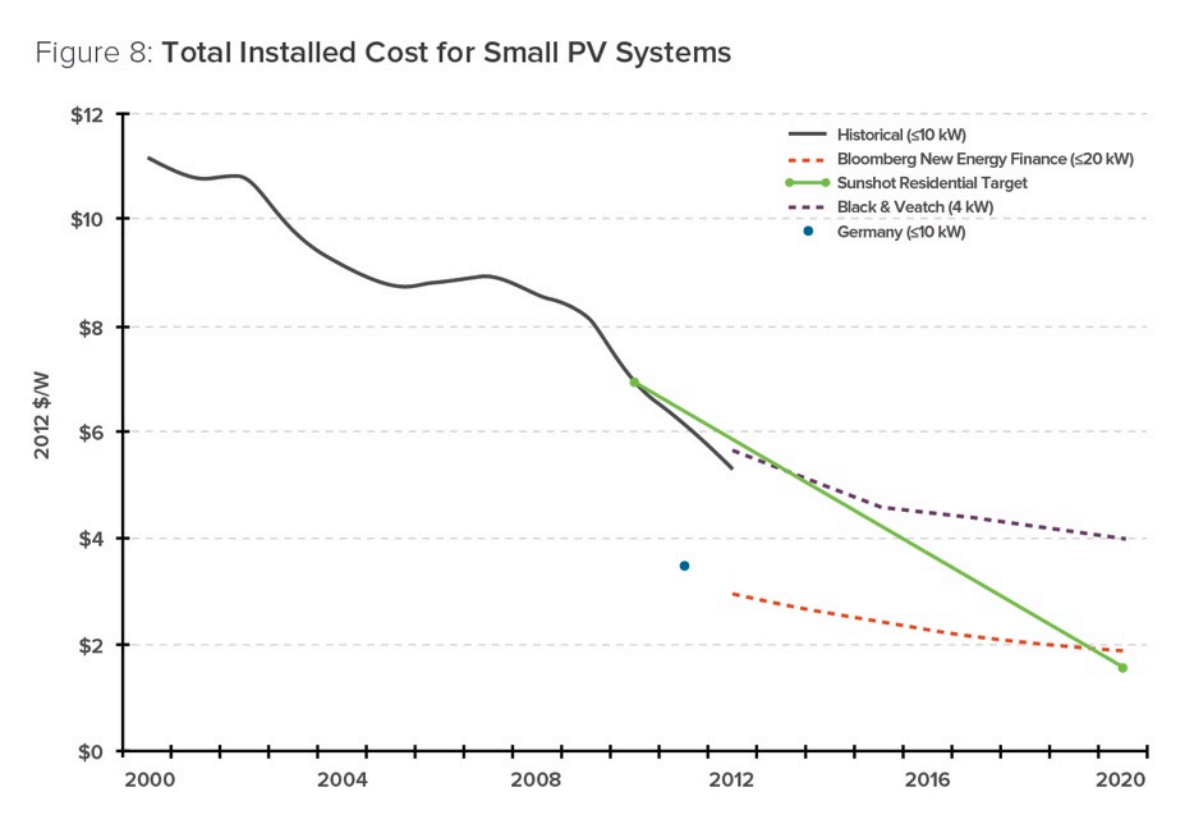
A DESIRE FOR INCREASED RESILIENCY

CUSTOMER EMPOWERMENT AND COMPETITIVE ADVANTAGE

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

UnitedHealth Group

TECHNOLOGY AND PRICE EVOLUTION



- $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

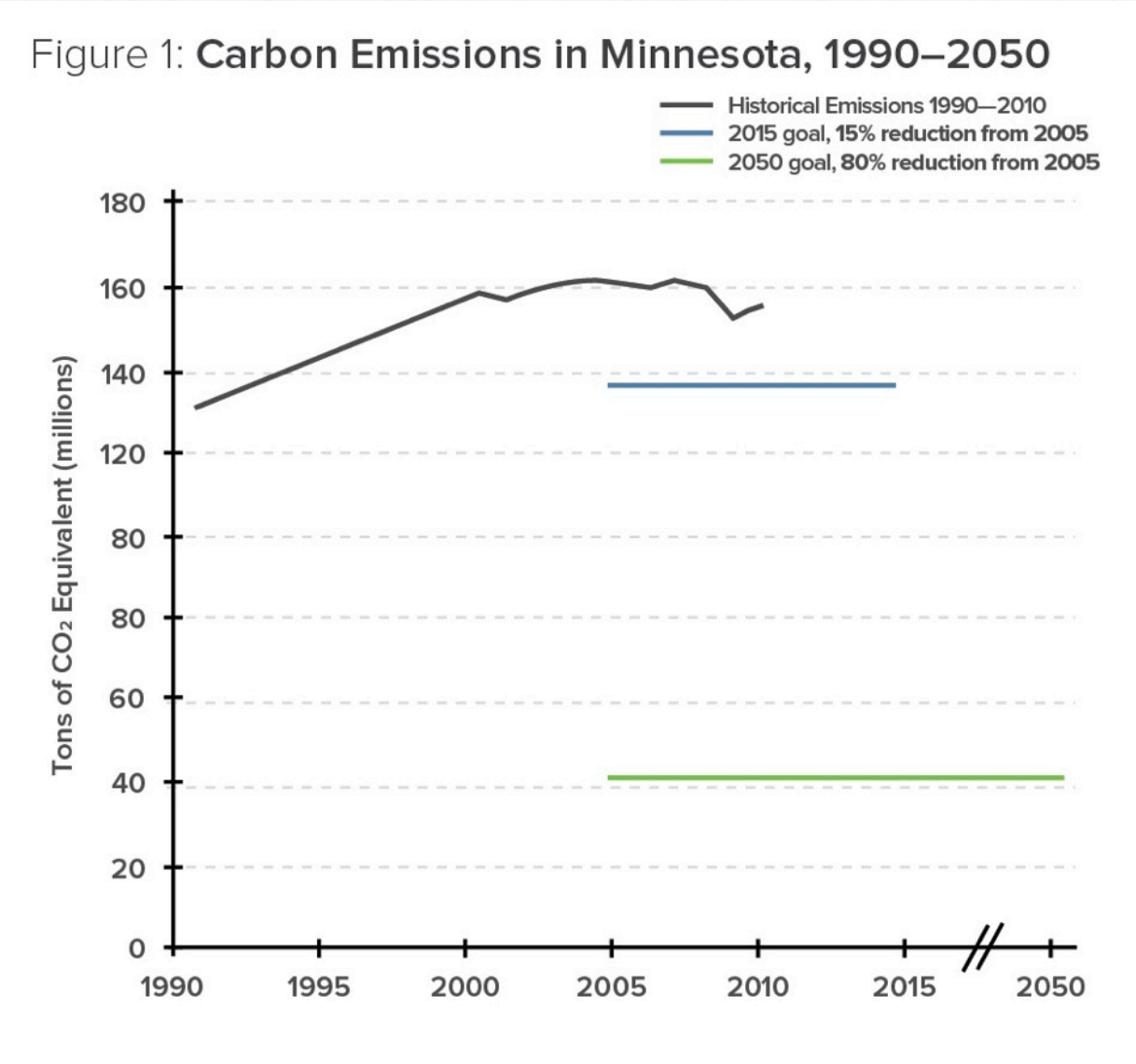
2

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

50%

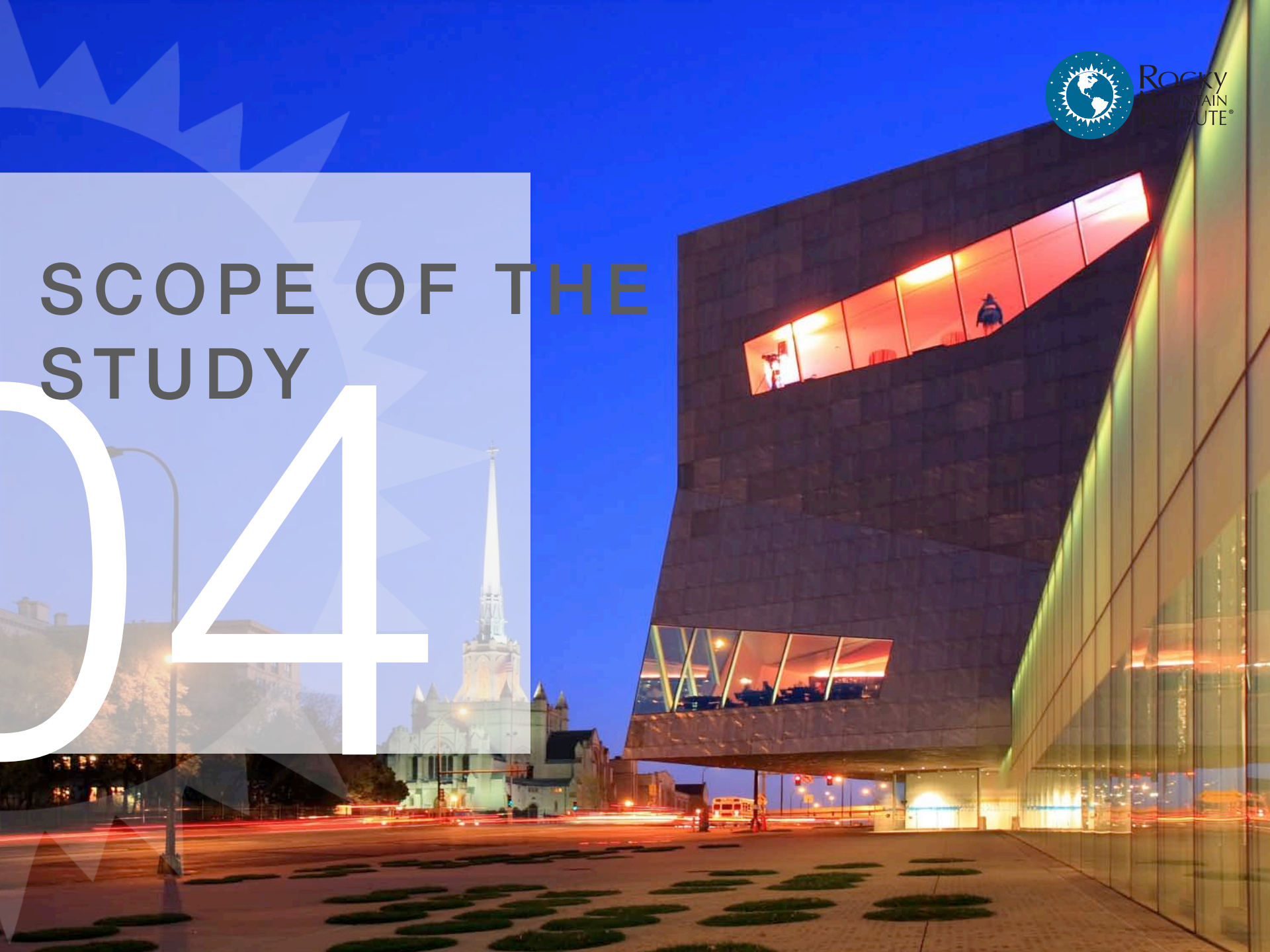
of Minnesota coal plants will be more than 40 years old by 2017

SHIFTING ACTION ON CLIMATE AND ENVIRONMENT



SCOPE OF THE STUDY

04



PRIMARY QUESTION

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

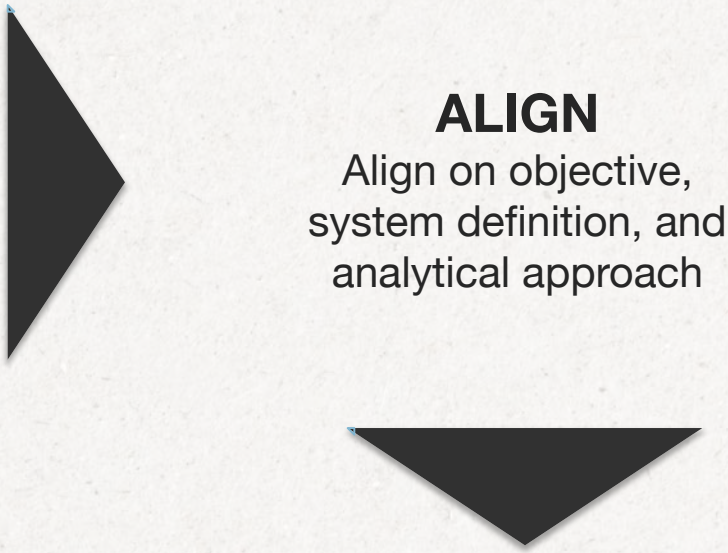
KEY QUESTIONS THE EFS MUST ANSWER

- 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 ALSO FOCUS ON HOW

ASSEMBLE
Assemble the right team

ALIGN
Align on objective, system definition, and analytical approach



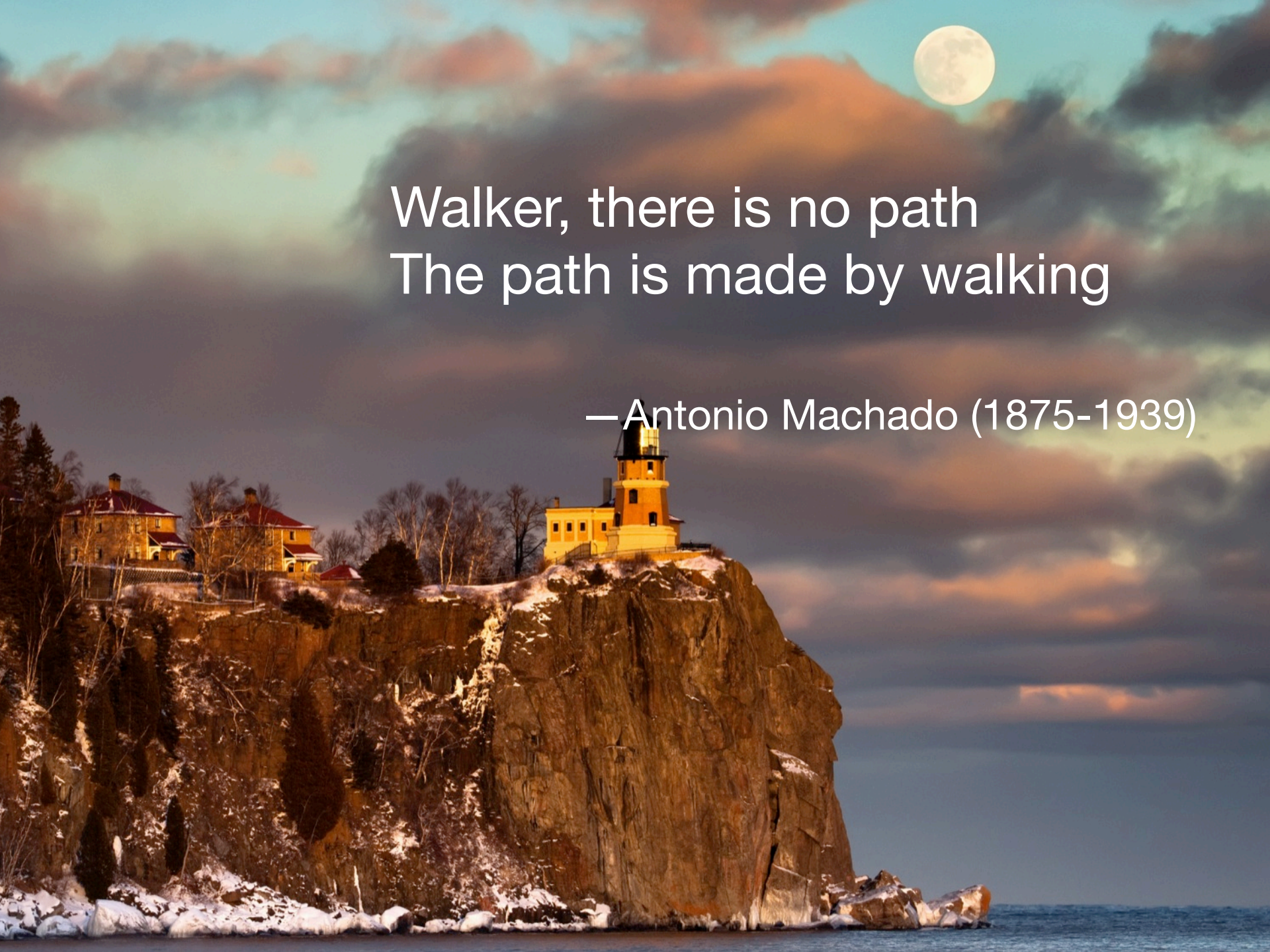
ACT
Create an ongoing process to keep the work alive

ASSESS
Assess feasibility, develop strategic vision, and build recommendations

3 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, engagement, and support


Walker, there is no path
The path is made by walking
—Antonio Machado (1875-1939)

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Creating a clean, prosperous, and secure energy future™