Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2015 Work Plan

Date of Report: January 20, 2015

Date of Next Status Update Report: January 1, 2016

Date of Work Plan Approval:

Project Completion Date: June 30, 2017

Does this submission include an amendment request? No

PROJECT TITLE: Analysis of Minnesota Energy Systems to Develop Future Energy Strategies

Project Manager: Annie Levenson-Falk

Organization: Legislative Energy Commission

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Location: Statewide

Total ENRTF Project Budget:		
	ENRTF Appropriation:	**$1,000,000**
	Amount Spent:	**$0**
	Balance:	**$1,000,000**

Legal Citation: M.L. 2015, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

I. PROJECT TITLE: Analysis of Minnesota Energy Systems to Develop Future Energy Strategies

II. PROJECT STATEMENT:

ENRTF funding will support technical modeling and analysis of energy systems to develop future state energy strategies, a key component of the Energy Future Framework, which the legislature directed the Legislative Energy Commission (LEC) to develop. A technical team will be chosen by request for proposal (RFP) process to conduct this analysis, and they will work closely with stakeholders from government, nonprofits and the private sector. The study team will also train State of Minnesota staff (for example, staff from the Pollution Control Agency and Department of Commerce, as well as research institutions and private organizations as possible) on the data and analytical methodologies to facilitate ongoing use and updating of the study in the future.

Minnesota's energy use has tremendous impacts on our air and water quality and the economic health of our communities. Since Minnesota has no fossil fuel resources of its own, the Minnesotans spend approximately $18 billion a year to import fuels – a staggering amount nearly the size of the state's annual general fund revenues. Today, about one-eighth of Minnesota's energy mix is renewable, such as wind, solar, and bioenergy. The rest is primarily fossil fuels (coal, oil, gas, etc.) burned to generate electricity, heat and cool buildings, run industry, and transport people and goods. Because of our fossil fuel dependence, emissions from the energy sector are detrimental to public health, and greenhouse gas emissions continue to rise.

Minnesota has been fortunate to benefit from reliable and relatively inexpensive energy, the basis for a strong economy, but even maintaining the status quo will require major investments, as aging infrastructure needs to be replaced. The state's two nuclear plants will retire in the 2030s unless their licenses are extended. Half of the state's coal plants will be 40 years old or older by 2017. Limited rail and fuel storage infrastructure has caused coal shortages, leading to idling of power plants and a dangerous propane shortage in 2013-14.

However, clean energy can be a tremendous economic resource for the state. Employment in clean energy sectors – efficiency, wind, solar, bioenergy, and smart grid – reached 15,300 in 2014, and surged 78 percent between 2000 and 2014, while the state's total employment grew just 11 percent. And clean energy jobs pay well, with an average worker earning 42 percent more than the statewide average annual wages.

The state's energy policy, however, is set in a piecemeal fashion, characterized by yearly legislative battles, too little long-term planning, and policy silos that make it difficult to integrate policy on electricity with heating, transportation, and Minnesota's agricultural and forest resources.

For that reason, the 2013 Legislature directed the Legislative Energy Commission (LEC) to develop a framework for Minnesota's energy future. M.S. 3.8852 states: "The Legislative Energy Commission, in consultation with the commissioner of commerce and other state agencies, shall develop a framework for the state of 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. The framework and strategy should aim to make Minnesota the first state in the nation to use only renewable energy."

A study scoping report was developed last year, outlining recommendations for how to approach such a large and complex question. It was conducted by Rocky Mountain Institute on behalf of the Dept. of Commerce, and is available at http://bit.ly/OV86ZE. This proposal closely follows the recommendations of the study scoping: developing multiple scenarios for the future and analyzing what might result from various combinations of energy resources.

LEC staff has reached out to many Minnesota stakeholders and convened an initial core team to advise on the Framework. Core team members include the below list. The team will be expanded as the project contributes, and groups representing interests in agriculture, rural cooperatives, thermal energy and many others have expressed their commitment to participate.

- Chamber of Commerce
- Cummins Power Generation
- Department of Commerce
- Department of Transportation
- Environmental Quality Board
- Fresh Energy
- Pollution Control Agency
- Xcel Energy

With the core team, LEC staff has developed a plan to meet the statutory obligations of M.S. 3.8852, developing an Energy Future Framework with three coordinated components: data collection, developing and analyzing potential future energy portfolios and scenarios (the component supported by this proposal); stakeholder engagement; and public engagement around the state.

The framework will integrate work being done by government, utilities and industry, and nonprofits to develop long-term pathways for the state's energy future. The study proposed here can built on extensive energy data collection and projections developed by state agency staff and consultants in the EQB's Climate Strategies and Economic Opportunities project, as well as additional work that will be conducted through a US Department of Energy grant to the Dept. of Commerce in 2015-16.

When it comes to Minnesota's energy systems, there is no such thing as doing nothing. Profound changes are already underway, and Minnesota has big decisions to make. The Energy Future Framework will allow these decisions to be well informed.

III. OVERALL PROJECT STATUS UPDATES:

Project Status as of January 1, 2016:

Project Status as of June 30, 2016:

Project Status as of January 1, 2017:

Overall Project Outcomes and Results:

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Technical analysis of Minnesota future energy use and supply
Description: A team, selected by RFP process, will develop and analysis potential clean energy pathways for Minnesota. The analysis will cover all sectors: electricity, transportation, buildings, industry, agriculture, and forestry.

Scenario building.
The study team, in consultation with the LEC and stakeholders, will create a set of scenarios for what could happen in the future based on various driving forces, such as the extent of declining technology costs, oil and gas prices, and the extent of electric vehicle adoption.

Create and model energy resource portfolios within those scenarios.

The study team will develop multiple energy resource portfolios, representing various energy mixes that could supply the future Minnesota economy. The initial recommendation from LEC staff and the core team is that portfolios be built to achieve 80-100% clean energy economy-wide by 2030 or 2050.

Portfolios will test various definitions of "clean energy," including:

- All energy efficiency and renewable sources
- Including large hydropower (hydropower generation with capacity over 100 megawatts does not currently qualify as renewable power in Minnesota)
- Include nuclear power
- Include fossil fuels with carbon capture
- Additional portfolios likely to be identified

The study team will model and analyze what will happen if the state transitioned to these energy resource portfolios, specifically what impact it would have on the following criteria:

- Affordability and cost-competitiveness
- Reliability, resilience, and risk management
- Economic development
- Environmental quality and public health
- Equity

Metrics will be identified under each criterion by stakeholders in collaboration with the study team.

Suggest short-, medium- and long-term pathways and key decisions.
Based on the analysis, the study team will propose short-, medium- and long-term energy pathways for the state of Minnesota, and highlight key decision points for legislators, regulators, institutional decision makers, and Minnesotans. For example, the team might suggest energy mixes and transition periods that maximize the above criteria, as well as where in the state to locate particular types of energy facilities.

It is not expected that there will be a clear-cut winning pathway based on the analysis, and it is very unlikely that all stakeholders would agree on a single path forward. Rather, the analysis may point to key characteristics of the system, key barriers the state is likely to face, key questions, and a number of feasible pathways for consideration.

Reporting and training.
The study team will create:

- A final report covering all stages of the modeling and analytical process, including details on the methodologies, models, assumptions, and analysis. All information – including data and models – should be made public to the maximum extent possible.
- A stand-alone executive summary.
- A core presentation with key visuals that can be extracted for use online and in other settings, and are appropriate for a wide range of non-technical audiences.

The study team will provide at least 500 printed copies of the executive summary and 50 printed copies of the full report, as well as electronic copies of all materials.

The study team will provide training to key Minnesota staff – likely to include state agency staff and others – on data and methodologies, to allow the tools to be used on an ongoing basis as much as possible.

Summary Budget Information for Activity 1: **ENRTF Budget: $ 1,000,000**

Amount Spent: $ 0
Balance: $ 1,000,000

Outcome	Completion Date
1. Build, model, and analyze scenarios and resource portfolios	April 2017
2. Identify potential energy pathways and key decision points	June 2017
3. Create and publish reporting materials	June 2017
4. Train key state staff on data and methodologies	June 2017

Activity Status as of January 1, 2016:

Activity Status as of June 30, 2016:

Activity Status as of January 1, 2017:

Final Report Summary:

V. DISSEMINATION:
Description: Ongoing updates and results will be disseminated through a dedicated Energy Future Framework website (pending funding) and an email listserv for individuals interested in detailed updates. Updates and results will be summarized through LEC communications channels: our website (www.lec.leg.mn), the general LEC email listserv, Twitter (@MNLegEnergy), and at LEC hearings. Project partners will share information through their communications channels, as well.

Status as of January 1, 2016:

Status as of June 30, 2016:

Status as of January 1, 2017:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:
A. ENRTF Budget Overview:

Budget Category	$ Amount	Overview Explanation
Professional/Technical/Service Contracts:	$1,000,000	A contractor will be selected by RFP to conduct modeling and analysis. The ideal contractor would be a team of individuals familiar with Minnesota energy systems and will have experience conducting this type of study.
TOTAL ENRTF BUDGET:	**$1,000,000**	

Explanation of Use of Classified Staff: N/A

Explanation of Capital Expenditures Greater Than $5,000: N/A

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: N/A

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: Approximately 5. This is a best estimate, as the actual FTEs cannot be determined before the contract is awarded.

B. Other Funds:

Source of Funds	$ Amount Proposed	$ Amount Spent	Use of Other Funds
Non-state	N/A	N/A	
US Department of Energy	$300,000	$0	Grant to Dept. of Commerce for state energy planning activities toward the year 2025. This will refine "business-as-usual" projections on multiple energy sectors and develop some shorter-term action steps.
State			
Legislative Energy Commission	$60,000	$0	LEC staff
TOTAL OTHER FUNDS:	**$360,000**	**$0**	

VII. PROJECT STRATEGY:

A. Project Partners:

The following organizations are members of the core team to date. Core team membership is being expanded to include key perspectives that are not yet represented.

- Minnesota Department of Commerce
- Minnesota Pollution Control Agency
- Minnesota Department of Transportation
- Minnesota Environmental Quality Board
- Fresh Energy
- Xcel Energy
- Minnesota Chamber of Commerce
- Cummins Power Generation

Minnesota Municipal Utilities Association, Minnesota Farmers Union, and many additional organizations have committed to participation in the project. Stakeholder engagement is a key component, and the list of partners will grow substantially as the project develops, especially as not all perspectives are yet represented.

B. Project Impact and Long-term Strategy:

The Energy Future Framework intends to continue Minnesota's legacy of strong energy policies, including the Renewable Energy Standard, Conservation Improvement Program, and biofuels requirements. It will benefit from and integrate recent and ongoing energy-related studies conducted by a variety of Minnesota entities, including the Climate Strategies and Economic Opportunities report (Environmental Quality Board), renewable electricity integration study (Dept. of Commerce), combined heat and power stakeholder process (Dept. of Commerce), clean energy industries analysis (DEED, Dept. of Commerce, and other agencies, through the National Governor's Association Clean Energy and Economic Development Policy Academy), and others. The Framework will inform a multi-interest network of Minnesota leaders, which will shape the bounds of the study, work in coordination with the study team to develop long-term recommendations and short-term actions, and drive implementation over time. The study team will also provide state agency staff with data and training to update the analysis in the future.

The Framework will give decision makers information they need to pursue Minnesota-based clean energy production in a way that maximizes Minnesota jobs, economic development, energy security, and the health of

Minnesota citizens. It will provide the long-term picture that is needed contextualize legislative, utility planning, and other energy sector decisions.

C. Funding History:

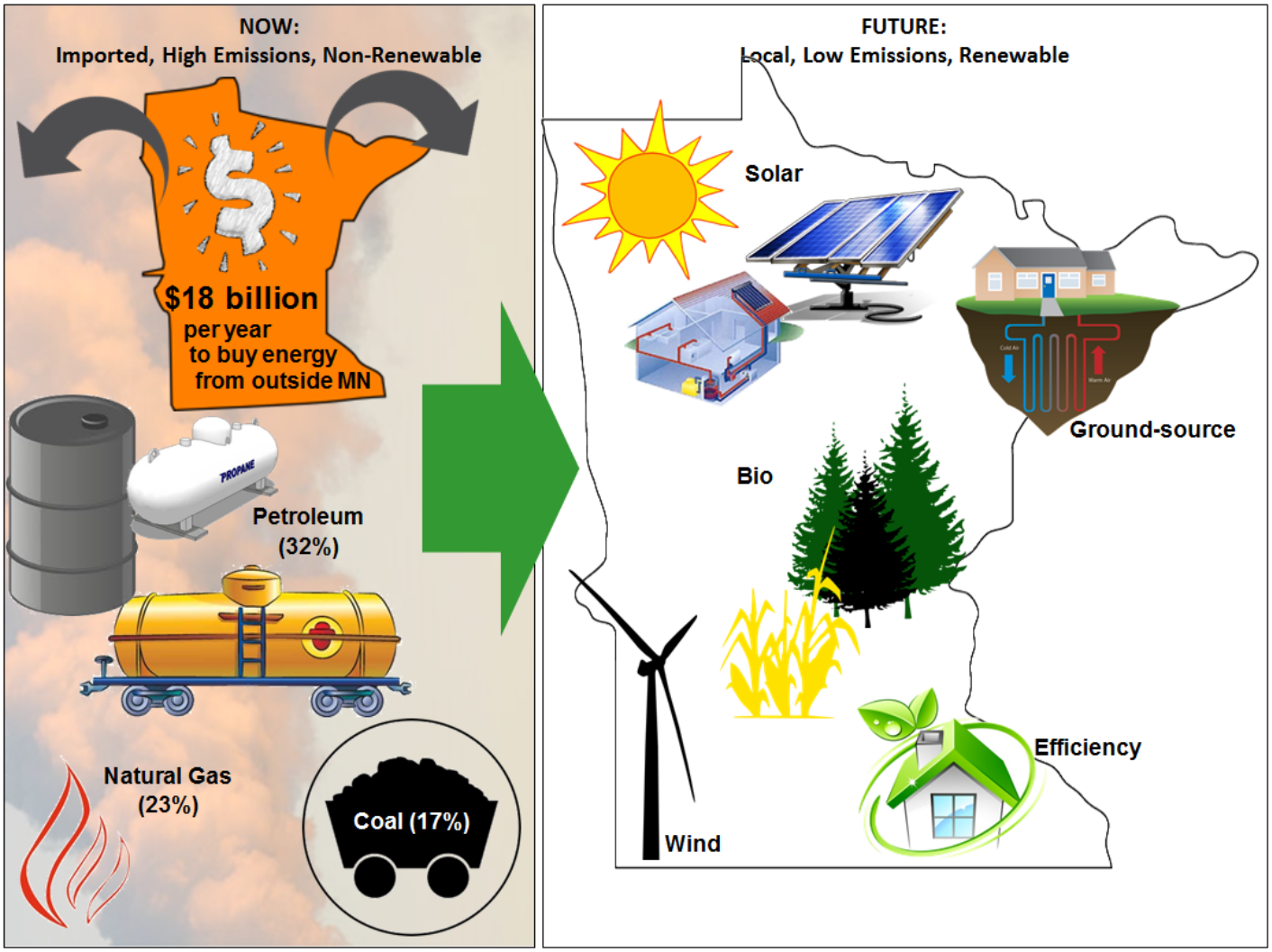
Funding Source and Use of Funds	Funding Timeframe	$ Amount
Dept. of Commerce – Energy Future Study Scoping	2013	$100,000
Legislative Energy Commission – personnel (in-kind)	Oct. 2013-Nov. 2014	$20,000
Rocky Mtn. Institute – eLab Accelerator (in-kind)	2014	$24,000

VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS:

A. Parcel List: N/A

B. Acquisition/Restoration Information: N/A

IX. VISUAL COMPONENT or MAP(S):



X. RESEARCH ADDENDUM: N/A

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than January 1, 2016, June 30, 2016, and January 1, 2017. A final report and associated products will be submitted between June 30 and August 15, 2017.

Environment and Natural Resources Trust Fund
M.L. 2015 Project Budget

Project Title: Ending Minnesota's Greenhouse Gas Emissions from Fossil Fuels
Legal Citation:
Project Manager: Annie Levenson-Falk
Organization: Legislative Energy Commission
M.L. 2015 ENRTF Appropriation: $1,000,000
Project Length and Completion Date: 2 Years, June 30, 2017
Date of Report: January 9, 2015

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	**Technical analysis**				
Professional/Technical/Service Contracts					
Study team TBD by competitive RFP	$1,000,000	$0	$1,000,000	$1,000,000	$1,000,000
COLUMN TOTAL	**$1,000,000**	**$0**	**$1,000,000**	**$1,000,000**	**$1,000,000**