



THE MENDOTA GROUP, LLC
— the power of bright ideas —

Energy Conservation and Optimization Act Implementation Process

Efficient Fuel-Switching Guidelines
Working Group – Meeting 3

January 12, 2022

Agenda

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|-----------|-------------------------------|
| 1:00 p.m. | Welcome and Introductions |
| 1:10 p.m. | Status Check and Path Forward |
| 1:15 p.m. | Step-by-Step Framework |
| 2:50 p.m. | Next Steps |
| 3:00 p.m. | Adjourn |

Introductions

Applied Energy Group (on behalf of Minnesota Energy Resources)	GDS Associates	Missouri River Energy Services
Cadmus	Great River Energy	Natural Resources Defense Council (NRDC)
Center for Energy and Environment (CEE)	ICF	Otter Tail Power Company
CenterPoint Energy	Lake Country Power	Owatonna Public Utilities
City of Minneapolis	Marty Kushler (ACEEE/CEE)	Slipstream
Connexus Energy	Michaels Energy	Southern Minnesota Municipal Power Agency (SMMPA)
Dakota Electric Association (DEA)	Midwest Energy Efficiency Alliance (MEEA)	Stearns Electric Association
Electrical Association	MN Dept. of Commerce	The Mendota Group, LLC
Elk River Municipal Utilities	MN Municipal Utilities Assoc. (MMUA)	University of Minnesota – Clean Energy Resource Teams
Energy Resources Center – Univ. of Illinois, Chicago	Minnesota Power	Willdan
Franklin Energy	Minnesota Rural Electric Association (MREA)	Wright-Hennepin Cooperative Electric Association
Fresh Energy	Minnkota Power Cooperative	Xcel Energy

Meeting Information

- All participants can speak, use video, and chat.
- Questions and observations can be placed in the chat.
 - Chat works fine; if you'd like to share thoughts verbally, please raise your hand and then you can unmute and speak.
- We are taking notes and will share the notes with participants after the meeting.
- We are recording this meeting but only to check our notes.
- We encourage participants to: actively participate, be positive and constructive, and open to different perspectives.

Status Check and Path Forward

Efficient Fuel-Switching Guidelines

Status Check

- Round 3 of “memos” received early 2022 (10 organizations)
 - Responded to: questions about hourly load shapes, cost effectiveness for non-traditional EFS, cost-effectiveness modeling for EFS vs. EE.
- Round 2 of memos received on 12-01-21 (5 organizations)
 - Responded to: “provide listing of specific scenarios, whether organization thinks they qualify, and the reasoning for why it qualifies (as well as questions you may have).”
- Round 1 of memos provided on 11-18-21 (9 organizations)
 - Addressed questions posed by DOC/Mendota Group and added own questions/issues.

Efficient Fuel-Switching Guidelines

Draft Step-by-Step Framework

- In response for requests for something to which Working Group members can react, we distributed on 1-9-22 a Draft framework (step-by-step).
 - We opted for this approach instead of convening Topics Groups.
- The framework's purpose was to provide detail on the relevant topics that utilities and the Department will need to consider in developing and seeking approval for EFS measures and projects.
- These are not guidelines, per se, nor are they intended to reflect the Department's determinations regarding how EFS should be evaluated or the standards/requirements EFS measures must meet.

Efficient Fuel-Switching Guidelines

Draft Step-by-Step Framework

- The framework is a starting point for the document that the Working Group will ultimately send to the Coordinating Committee and the Coordinating Committee, in turn, will send to the Department for their consideration.
- We are anticipating that the document the CC forwards to the Department will outline the major topic areas for developing and approving Efficient Fuel-Switching Improvements and describe WG and CC member positions relative to the major topics.
- It will be up to Department Staff to develop actual guidelines that will be distributed to the service list as a Proposed Decision.

Step-by-Step Framework

EFS Step-by-Step Framework

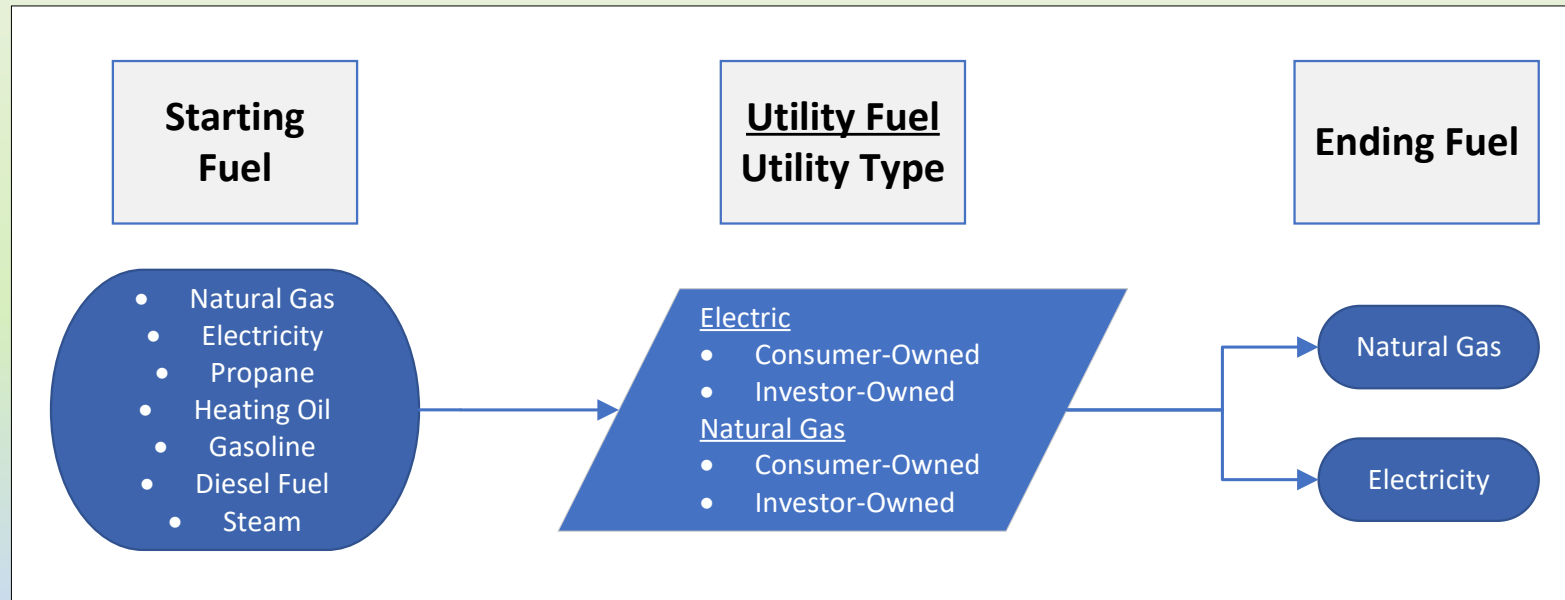
Step-by-Step

- The steps are a walk-through of the requirements of the ECO Act with respect to Efficient Fuel-Switching Improvements.
- This draft is not a draft version of the DOC's guidelines as those will likely require additional information, including a glossary of terms and possibly a set of use cases, among other items.
- The framework also includes simplifying assumptions (e.g., source GHG emissions) that are intended for further discussion, noting that it will be important to attempt to develop recommendations that all utilities can effectively implement.

EFS Step-by-Step Framework

Step 1 – Starting and Ending Fuels and Utilities

Figure 1 - Eligible Fuels and Utility Types



- This graphic, too, simplifies the scenarios, but does contemplate that fuels can switch to natural gas and does include consumer-owned gas utilities as eligible to participate.

EFS Step-by-Step Framework

Step 2 – Qualifying Technologies

- Establishes terminology from ECO Act – requires installation of equipment that utilizes electricity or natural gas.
- “EFS Technology”, “EFS Measure” or “EFS Improvement” is the new fuel technology that the utility’s program will incent or otherwise encourage the customer to install/implement as a replacement for a source fuel technology that serves the same or similar purpose.
- The EFS measure uses natural gas, electricity, or some combination of the two fuels. An EFS improvement must replace a similar technology that uses an acceptable source fuel.

EFS Step-by-Step Framework

Step 3 – Determine EFS Improvement and Baselines

- Like EE measures and projects, EFS Improvements require a baseline technology to which they can be compared.
 - For purposes of these Efficient Fuel-Switching Guidelines, it is assumed that the utility program has induced the customer to implement the EFS improvement.
- Provide guidelines regarding Energy Efficient Actions applicable to energy efficiency measures in Appendix 1 – these generally align with the approach embodied in Minnesota’s Technical Reference Manual.
- Framework, though, draws distinctions between Efficient Fuel-Switching Improvements and energy efficiency/conservation – in specifying that the EFS does not need to provide the same level of service/quality as the baseline technology but, rather, a similar level of service.

EFS Step-by-Step Framework

Step 4 – Energy Change Analysis, Source Energy, GHG Emissions

- Energy Change Analysis: Confirms that EFS increases use of electricity or natural gas as established through a series of steps.
- Decrease in Source Energy Consumption (on a fuel-neutral basis):
 - Framework breaks EFS into Traditional and Non-Traditional Fuels groupings
 - For Traditional (electricity and natural gas), Source Energy for electrification projects is determined by utility's 20-year forecasted generation mix, presented as an annualized heat rate value in BTU/kWh.
 - For Non-Traditional, Source Energy BTU values are specified for propane, gasoline, and diesel fuel.
- The site energy savings are expressed as the kWh or Therms savings of the replaced original fuel baseline technology and the increased kWh or Therms consumption from the substituted EFS measure technology.

EFS Step-by-Step Framework

Step 4 – Energy Change Analysis, Source Energy, GHG Emissions

- Per ECO, which directs to use definition of Greenhouse Gas Emissions from 216H.01, using CO₂e to include CO₂, methane and nitrous oxide emissions (not HFCs, PFCs, SF6 for now).
 - Lifecycle CO₂e emissions are based on EUL of EFS Improvement.
- Baseline technology (assume here to simplify, natural gas technology) is calculated based on its EUL and avoided GHG emissions.
- Efficient Fuel-Switching Measure uses annualized metric tons of CO₂e emissions per MWh for the supplying electricity provider over the relevant projected timeframe (currently says 15-year IRP, or other forecast).
- This is one way to do the estimates; although, it is very definitely a simplified approach (more on next slide).

EFS Step-by-Step Framework

Step 4 – Energy Change Analysis, Source Energy, GHG Emissions

- ECO Act specifies use of hourly emissions.
 - Hourly (8,760) emissions can be annualized or put into some other form – weekday/weekend, average summer/average winter day, average weekly.
 - Can use marginal or average emissions over the respective time horizons.
- We would note that true use of hourly emissions (whether marginal or average) implies that EFS measure and baseline load shapes are up-to-date and accurate.
 - Other than for custom measures (and, often, hourly aren't necessarily available for Custom either), hourly load shapes are not updated frequently as this is costly.
 - As such, to qualify EFS measures, aligning Emissions factor granularity with availability of good load shape data is a consideration.
- Can use one method (say annualized form) to qualify measures and another method to evaluate cost effectiveness and compare.

EFS Step-by-Step Framework

Step 4 (cont'd) – Improve Utility Load Factor, Integration of Renewables

- Improve utility load factor: EFS must improve a utility's system load factor *relative to the baseline technology*
 - Doesn't make sense to compare load factor to baseline technologies (many of which will be natural gas – no relevant load factors), it assumed that the analysis focuses on changes to the utility's load factor with and without the EFS measure.
 - This deviates from the "compare to baseline" approach because looking simply at new technology relative to the utility's existing load factor.
- Load factor is ratio of the average load in megawatts supplied during a designated period (assumed a year) to the maximum load in megawatts that was supplied during that designated period
- Propose that utility compares the year-by-year impact on utility's system load shape for EUL of EFS measure.

EFS Step-by-Step Framework

Step 4 (cont'd) – Improve Utility Load Factor, Integration of Renewables

Applies to IOUs

- Integration of renewables is not a stage gate for approval of EFS measures - “department must also consider whether the fuel-switching improvement can be operated in a manner that facilitates the integration of variable renewable energy into the electric system”.
- It is, though, an important criterion that utilities must consider in assessing EFS Improvements .
- Framework interprets this to mean that the EFS Technology, as operated by an end-use customer, helps facilitate both for current operational and for longer-term planning purposes use of renewable energy in place of fossil-fueled energy.
- Interested in learning from utilities what features can be integrated into (or with) EFS Improvements to facilitate integration of renewable energy into the system.

EFS Step-by-Step Framework

Step 5 – Cost Effectiveness

- Fuel-Switching Improvements must be cost effective using Utility, Participant and Societal Tests.
- Framework specifies that each EFS Measure must be cost effective.
- Framework directs utilities to create an Efficient Fuel-Switching Segment within their CIPs to facilitate approving, tracking and reporting EFS Improvements.
- For Traditional Fuels, cost-effectiveness modeling will be done like energy efficiency modeling.
 - Propose that utilities combine the electric and gas factors (akin to modelling measures with interactive effects).
- For Non-Traditional Fuels, the Framework does not directly address how these should be modeled but suggests that the DOC's Cost-Effectiveness Task Force may be better suited to address.

EFS Step-by-Step Framework

Reporting, Net Benefits, EFS Example

- Framework specifies that utilities will report EFS Improvement savings based on the utility delivering the program (with BTU savings converted to therms or kWh).
- Also directs utilities to provide details around number of EFS Improvements rebated, number of participants, and increases and decreases to relevant fuels.
- Framework places the burden on utilities to demonstrate that the “primary purpose and effect” of the energy efficiency program with which an Efficient Fuel-Switching improvement is energy efficiency.
- Other items needed?

Next Steps

Next Steps

- DOC and Mendota Group can receive comments on the Framework by January 21, 2022.
 - Framework is uploaded to “Framework Document” folder within the Efficient Fuel Switching Working Group folder.
 - Also set a “Memos on Framework” folder for comments – these can include redlines on the Framework itself.
- We will use this information to develop the WG report to the Coordinating Committee for final reactions before the document is submitted to the Department for input to their development of Guidelines.
- We may reach out to individuals and groups to clarify positions.

The End (of this presentation)

- Thank you for your participation and contributions to this effort.
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