



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

Energy Conservation and Optimization Act Implementation Process

Efficient Fuel-Switching Guidelines
Working Group

December 8, 2021

Agenda

- 1:00 p.m. Welcome and Introductions
- 1:10 p.m. Status Check and Path Forward
- 1:15 p.m. Path Forward Example
- 1:45 p.m. Definitions and Methodologies
- 2:30 p.m. Next Steps
- 2:45 p.m. Adjourn

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 will be 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 1 of memos provided on 11-18-21 (9 organizations)
 - Addressed questions posed by DOC/Mendota Group and added own questions/issues.
- 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).”
- Many remaining questions and need for path forward.
 - All entered into Issues Tracker (approx. 84 line-items).
 - Also, mock-up of use cases on SharePoint.

Efficient Fuel-Switching Guidelines

Path Forward

1. Solidify around what we know based on plain reading of statute:
 - Electric utilities (IOUs and COUs) can promote projects that switch fuel use from natural gas (and delivered fuels) to electricity,
 - Natural gas utilities (IOUs) can promote projects that switch fuel use from natural gas to electricity,
 - All projects need to meet the four-part test (IOUs from 216B.241, subd. 12 and COUs from 216B.2403, subd. 8).
2. Doesn't prohibit other scenarios, if they meet energy efficiency requirements.

Efficient Fuel-Switching Guidelines

Path Forward

3. Focus on topic areas, identify issues, and propose solutions.
 - Develop methodologies and approaches.
 - Request that Working Group members volunteer to help identify issues and propose solutions.
4. Groups/individuals confer with Anthony and Grey over next few weeks, by email, SharePoint and meetings.
5. Weekly update WG members on progress and when information is available for review.
6. Present information and discuss at meetings week of Jan. 3.

Path Forward Example

Efficient Fuel-Switching Guidelines

Path Forward - Example

- A residential customer in Minneapolis wants to replace a 25-year-old 3-ton central air-conditioning with direct-expansion cooling and gas furnace heating (DXGF). The equipment efficiency rating is SEER10 and 78% AFUE. The customer is considering installing a high-efficiency air source heat pump (ASHP) that provides heating and cooling. The expected equipment operational date is May 2022.
 - **Actions:** Replace on Fail (because past EUL)
 - **Baseline Comparison Technology:** Split system air conditioner 13 SEER, Furnace w/o ECM or boiler – AFUE 90% (new construction baseline).
 - **New Measure:** ASHP SEER 15, HSPF 8.7, EUL 15.

Efficient Fuel-Switching Guidelines

Path Forward - Example

- *Replaces a fuel used by a customer with electricity or natural gas delivered at retail by a utility subject to section 216B.2403 or 216B.241]*
 - **Yes.** Equipment that uses two “fuels” (electricity and natural gas) is replaced by all electric equipment.
 - [Use cases.](#)
- *Net decrease in source energy consumption on a fuel-neutral basis [subd. 4(2)]?*
 - **Yes.** Increase of 364 kWh and decrease of 60 therms/year. (+1,241,556 - 6,000,000 BTUs = 4.758 mmBTU).
 - [Conversion factors and baselines.](#)
- *Net increase in use of electricity or natural gas [subd. 4(3)]?*
 - **Yes.** Increase of electricity.
- *The installation of equipment that utilizes electricity or natural gas, resulting in a reduction or elimination of the previous fuel used [subd. 4(4)]?*
 - **Yes.**

Efficient Fuel-Switching Guidelines

Path Forward - Example

- *Results in a net reduction of statewide greenhouse gas emissions as defined in section 216H.01, subdivision 2, over the lifetime of the improvement [216B.2403, subd. 8 and 216B.241, subd. 11(d)]. For an electric (public) utility, the reduction in emissions must be measured based on the hourly emission profile of the electric utility, using the hourly emissions profile in the most recent resource plan approved by the commission under section 216B.2422;*
 - *60*15 = 900 therms reduction: 4.8 metric tonnes of CO₂ (used 0.0053 metric tons/therm)*
 - *364 * 15 = 5,460 kWh increase: 2.02 metric tonnes of CO₂ (used 0.37 metric tons/MWh)*
 - *Yes. Reduces CO₂ by 2.78 metric tons.*
 - *Hourly emissions profile CO₂ and equipment load shapes.*

Efficient Fuel-Switching Guidelines

Path Forward - Example

- *(a) A fuel-switching improvement is deemed efficient if, applying the technical criteria established under section 216B.241, subdivision 1d, paragraph (e), the improvement, relative to the fuel being displaced:*
 - *(3) is cost-effective, considering the costs and benefits from the perspective of the (consumer-owned) utility, participants, and society [216B.2403, subd. 8(3)]*
 - *(3) is cost-effective, considering the costs and benefits from the perspective of the (public) utility, participants, and society [216B.241, subd. 11(d)(3)];*
 - [How are net BTU savings converted into reportable savings?](#)
 - [Must utilities update their avoided costs?](#)
 - [What needs to be incorporated into the TRM and how will custom projects work?](#)

Efficient Fuel-Switching Guidelines

Path Forward - Example

- *(a) A fuel-switching improvement is deemed efficient if, applying the technical criteria established under section 216B.241, subdivision 1d, paragraph (e), the improvement, relative to the fuel being displaced:*
 - *(3) is cost-effective, considering the costs and benefits from the perspective of the (consumer-owned) utility, participants, and society [216B.2403, subd. 8(3)]*
 - *(3) is cost-effective, considering the costs and benefits from the perspective of the (public) utility, participants, and society [216B.241, subd. 11(d)(3)];*
 - [How are net BTU savings converted into reportable savings?](#)
 - [Must utilities update their avoided costs?](#)
 - [What needs to be incorporated into the TRM and how will custom projects work?](#)

Efficient Fuel-Switching Guidelines

Path Forward - Example

- *(a) A fuel-switching improvement is deemed efficient if, applying the technical criteria established under section 216B.241, subdivision 1d, paragraph (e), the improvement, relative to the fuel being displaced:*
 - *(4) is installed and operated in a manner that improves the (consumer-owned or public) utility's system load factor [216B.2403, subd. 8(4) and 216B.241(d)(4)].*
 - *For fuel-switching improvements that require the deployment of electric technologies, the 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 (public utility's) electric system [216B.241, subd. 11(b)].*
 - How is load factor determined and how do provide transparency for all utilities that will use the calculations?
 - How does one determine whether the fuel-switching improvement can be operated in a manner that facilitates integration of variable renewable energy in the electric system and must the improvement facilitate integration to qualify?

Definitions and Methodologies

Efficient Fuel-Switching Guidelines

Definitions and Methodologies (Primary Topic Definitions)

- Clear definitions and methodologies for categorizing or determining:
 - a) Efficient Fuel-Switching [216B.2402 *subd. 4.*]
 - b) Replaces a fuel used by a customer with electricity or natural gas delivered at retail by a utility subject to section 216B.2403 or 216B.241 [*subd. 4(1)*].
 - c) Net decrease in source energy consumption on a fuel-neutral basis [*subd. 4(2)*].
 - d) Net increase in use of electricity or natural gas [*subd. 4(3)*].
 - e) The installation of equipment that utilizes electricity or natural gas, resulting in a reduction or elimination of the previous fuel used [*subd. 4(4)*].
- Needs:
 - Determine whether EFS is energy efficiency or use different baselines (relevant to - a, c, d, e);
 - Mechanisms and methodologies for determining source energy consumption (presumably on a BTU basis for fuel neutrality);
 - Definition of equipment, project, fuel-switching improvement (terms used to describe EFS).

Efficient Fuel-Switching Guidelines

Definitions and Methodologies (Greenhouse Gases)

- Clear definitions and methodologies for categorizing or determining:
 - Results in a net reduction of statewide greenhouse gas emissions as defined in section 216H.01, subdivision 2, over the lifetime of the improvement [216B.2403, *subd. 8* and 216B.241, *subd. 11(d)*].
 - As part of the filing (CIP), demonstrate by a comparison of greenhouse gas emissions between the fuels that the requirements of subdivisions ... are met, as applicable, using a full fuel-cycle energy analysis [216B.2403, *subd. 3* and 216B.241, *subd. 2*].
- Needs:
 - How determine that project reduced statewide greenhouse gas emissions using 216H.01 definition (currently thinking focus on CO₂);
 - How conduct assessment using full fuel-cycle energy analysis and demonstrate its application.

Efficient Fuel-Switching Guidelines

Definitions and Methodologies (Greenhouse Gases - continued)

- For an efficient fuel-switching improvement installed by -
 - an electric utility, the reduction in emissions must be measured based on the hourly emission profile of the electric utility, using the hourly emissions profile in the most recent resource plan approved by the commission under section 216B.2422;
 - an electric consumer-owned utility, the reduction in emissions must be measured based on the hourly emissions profile of the consumer-owned utility or the utility's electricity supplier, as reported in the most recent resource plan approved by the commission under section 216B.2422. If the hourly emissions profile is not available, the commissioner must develop a method consumer-owned utilities must use to estimate that value [216B.2403, subd. 8 and 216B.241, subd. 11].
- Needs:
 - How measure GHGs based on hourly emission profile from most recent resource plan;
 - If hourly emissions profile not available, how best to estimate emissions;
 - How this incorporate into an assessment tool for purposes of qualifying project.

Efficient Fuel-Switching Guidelines

Definitions and Methodologies (Cost Effectiveness Tests)

- Clear definitions and methodologies for categorizing or determining:
 - (a) A fuel-switching improvement is deemed efficient if, applying the technical criteria established under section 216B.241, subdivision 1d, paragraph (e), the improvement, relative to the fuel being displaced:
 - (3) is cost-effective, considering the costs and benefits from the perspective of the (*consumer-owned*) utility, participants, and society [216B.2403, subd. 8(3)]
 - (3) is cost-effective, considering the costs and benefits from the perspective of the (*public*) utility, participants, and society [216B.241, subd. 11(d)(3)];
 - Savings claims and how considered for each utility.
- Needs:
 - Develop approach for conducting cost-effectiveness assessment based on 3 tests (applicable to different CE assessment tools);
 - Determine if any updates to avoided costs or other CE inputs required;
 - Other.

Efficient Fuel-Switching Guidelines

Definitions and Methodologies (Load Factors, Renewables Integration)

- Clear definitions and methodologies for categorizing or determining:
 - (a) A fuel-switching improvement is deemed efficient if, applying the technical criteria established under section 216B.241, subdivision 1d, paragraph (e), the improvement, relative to the fuel being displaced: (4) is installed and operated in a manner that improves the (consumer-owned or public) utility's system load factor [*216B.2403, subd. 8(4) and 216B.241(d)(4)*].
 - For fuel-switching improvements that require the deployment of electric technologies, the 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 (**public utility's**) electric system [*216B.241, subd. 11(b)*].
- Needs:
 - How determine whether project improves utility's system load factor and whether needs to be confined to "a fuel-switching improvement" (or can be more broadly defined);
 - How determine whether the electric fuel-switching improvement is operated in a manner that facilitates integration of variable renewable technologies.

Efficient Fuel-Switching Guidelines

Definitions and Methodologies (Other)

- Clear definitions and methodologies for categorizing or determining:
 - Other topics of interest to WG members (M&V, how to leverage EFS projects for more comprehensive efforts, application of EFS to low-income programs, etc.)
- Needs:
 - Write-ups on the topics that can potentially be incorporated into draft guidelines.
 - Items raised by WG participants are in the EFS tracker.

Next Steps

Next Steps

- Topics Leads:
 - Primary Topic Definitions
 - Greenhouse Gas Emissions
 - Load factors and renewables integration
 - Cost Effectiveness
- From now until end of the year, individuals/groups will exchange information to refine approaches to addressing questions, develop methodologies.
- Currently anticipating meetings week of Jan. 3. Will be obtaining availability from volunteers to set meetings.

The End (of this presentation)

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