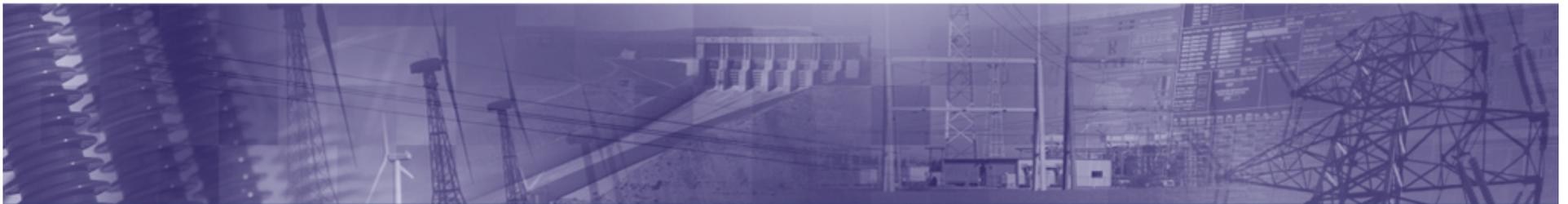# Technical Meeting on Implementation of Loss Factors in Compliance With Decision 790-D03-2015

John Martin, Senior Tariff and Regulatory Advisor

June 7, 2016 — Calgary

Agenda

- Introduction, objectives, and background

- Discussion of treatment of net-to-grid values based on merit order volumes

- Discussion of alternative approaches to application of shift factor in loss factor calculation methodology

- Progress update

Introduction

- Each participant to introduce self, including who he or she is representing

- Scope of discussion is two aspects of the implementation of loss factors in compliance with Decision 790-D03-2015

- Presentation is based on work to date by AESO

  – Incorporates comments from individual stakeholder discussions

- Please ask questions during presentation

- Discussion is on "without prejudice" basis

- Presentation slides will be posted on AESO website

Objectives

- Stakeholders to understand AESO's considerations for treatment of net-to-grid values based on merit order volumes

- Stakeholders to understand AESO's considerations for alternative approaches to application of shift factor in loss factor calculation methodology

- Stakeholders to have opportunity to identify additional matters that should be considered with respect to those two topics

Background

- Commission issued Decision 790-D03-2015 on November 26, 2015

    - Approved incremental loss factor methodology and directed several changes to AESO proposals

- AESO submitted implementation plan to develop a revised loss factor rule on February 1, 2016

    - Implementing revised loss factors by January 1, 2017 was considered possible but challenging

    - Commission held technical meeting on implementation plan on February 25, 2016

- Commission issued ruling approving implementation plan on March 3, 2016

   - Ruling noted matters requiring further consideration

Background (cont'd)

- AESO submitted Q1 Update on March 31, 2016

  - Included expectation of technical meeting by the beginning of June

- AESO posted initial input data for calculation of 2017 loss factors on its website on April 12, 2016

# Treatment of net-to-grid values based on merit order volumes

- In its implementation plan, the AESO identified the issue of determining net-to-grid dispatch values for 8,760 hours of historical energy market merit order volumes

- Issue affects industrial systems and generators with on-site load

- AESO has further examined the treatment of net-to-grid values based on merit order volumes and seeks additional input from stakeholders

Many industrial systems and generators have multiple generating units
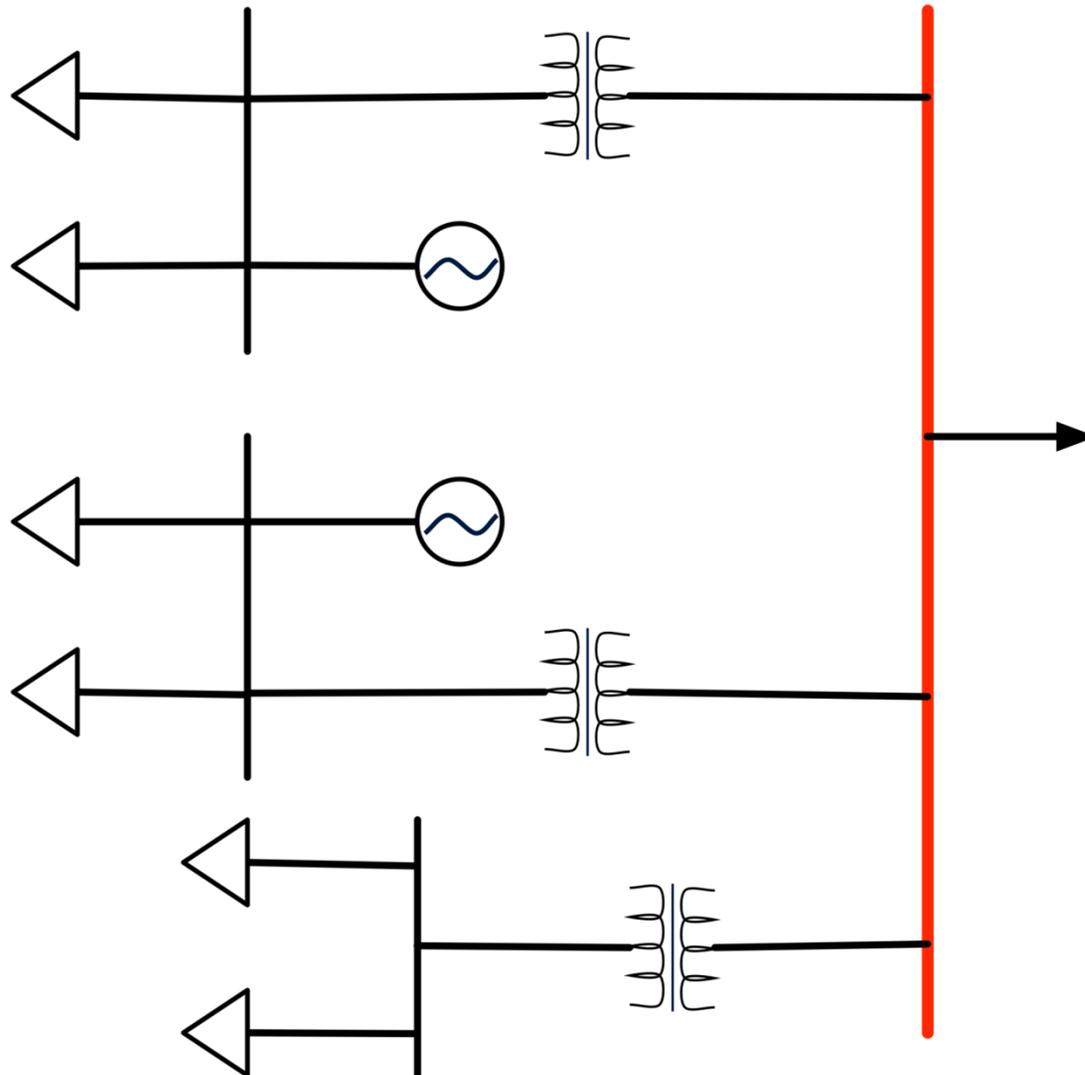
Merit order volumes are determined at a point other than the measurement point
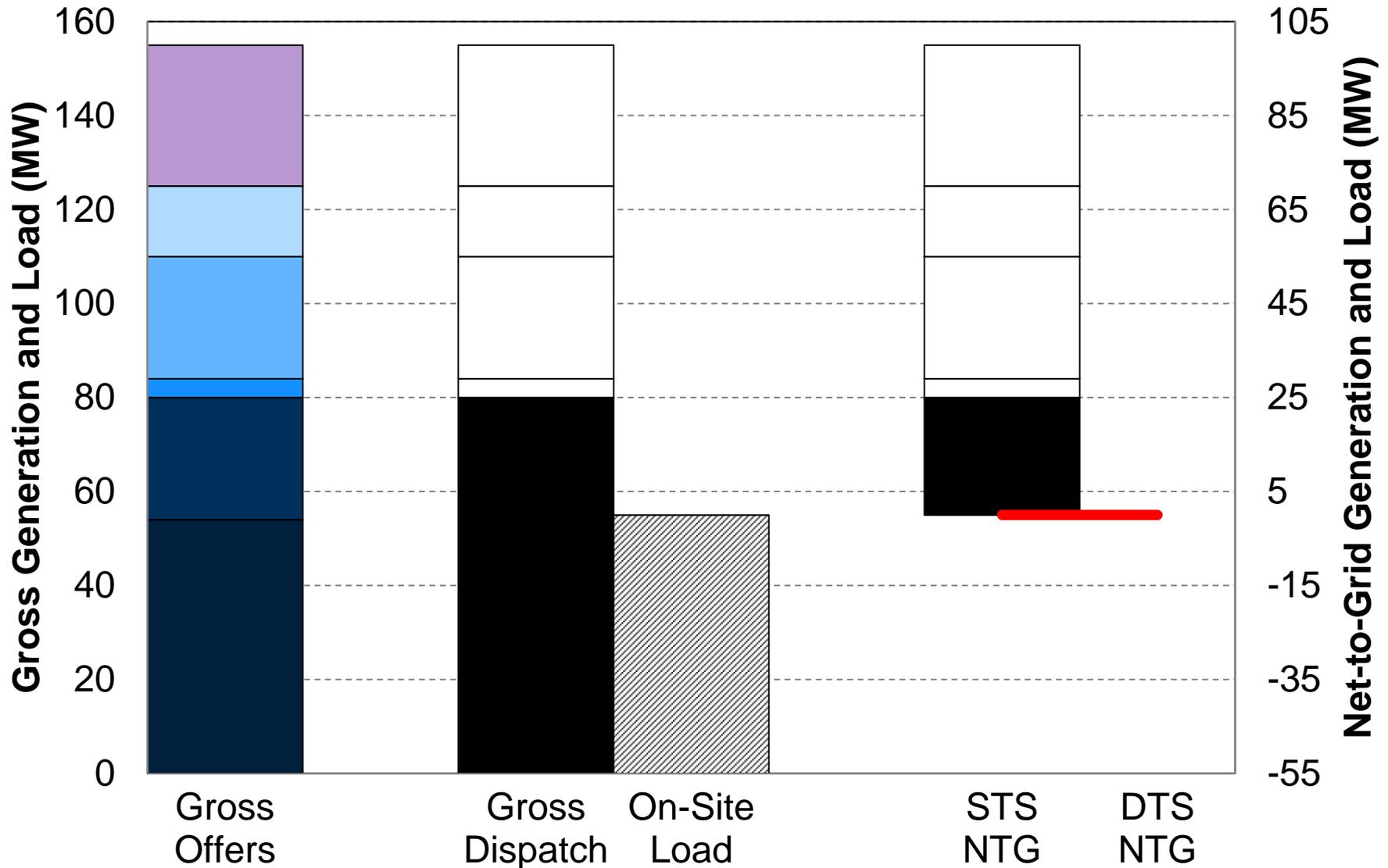

EMMO Generators
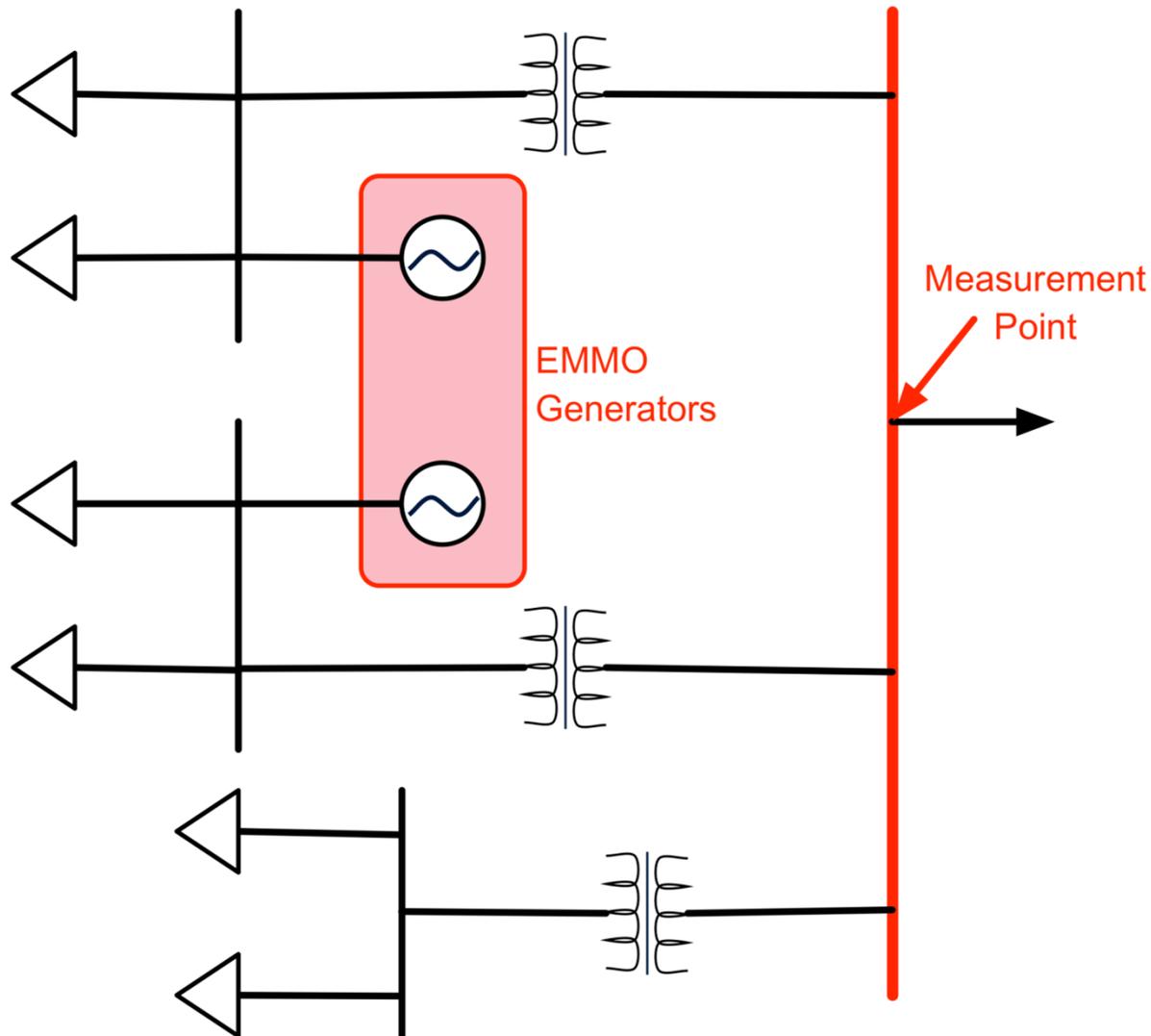
Measurement Point

Loss factor calculation methodology should align with application of loss factors
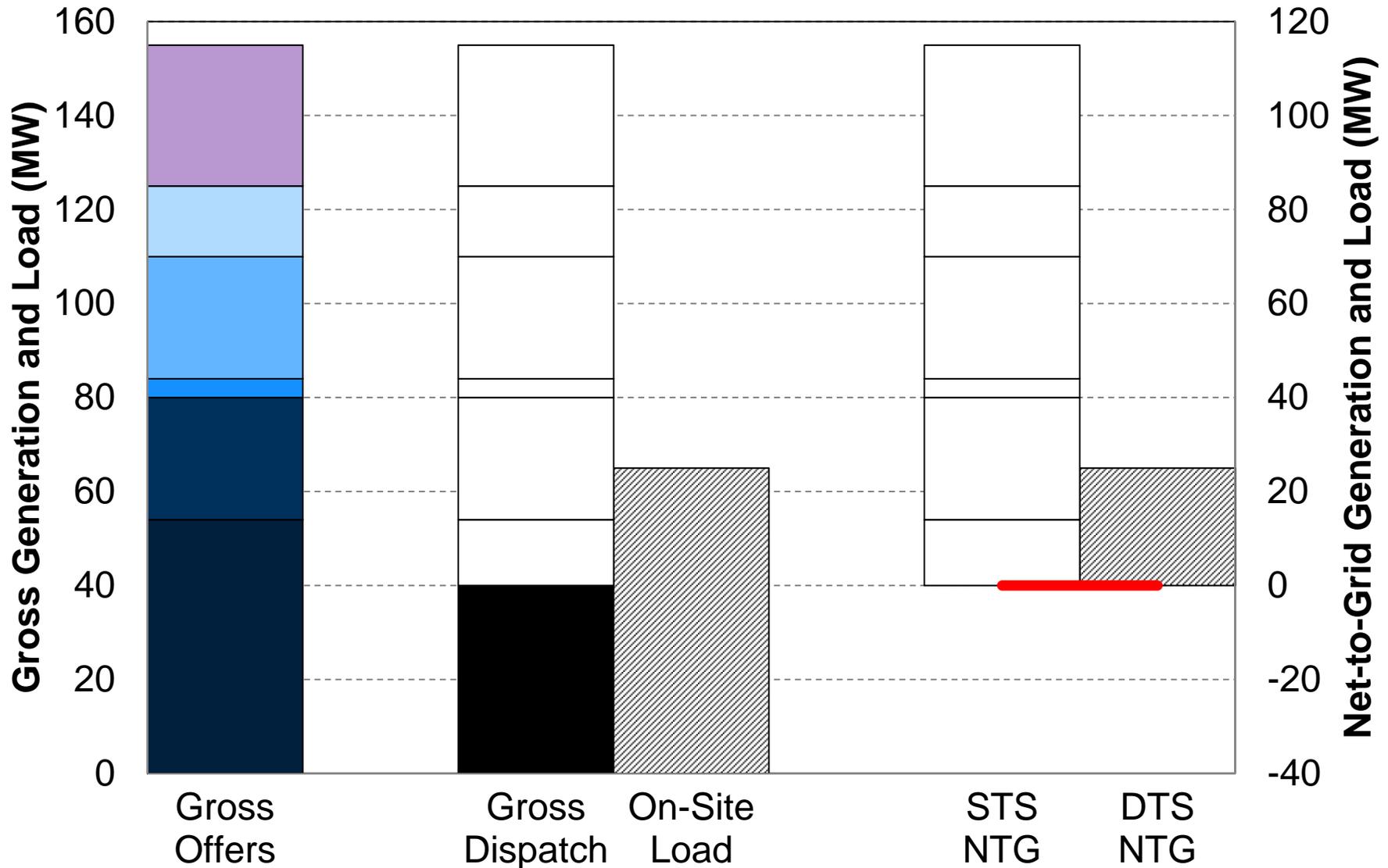
- Merit order volumes reflect offers in the energy market

- Measurement points reflect volumes delivered to the transmission system

- Loss factors are applied to measurement point volumes, not to merit order volumes

- AESO suggests modifying merit order volumes to simulate a net-to-grid merit order that retains offer order while aligning with measurement point volumes

  – In an hour where net-to-grid volume indicates supply from the site, loss factor will be calculated for net-to-grid supply

  – In an hour where net-to-grid volume indicates delivery to the site, there will be no loss factor calculated

Scenario 2: On-site load is greater than dispatch of generator gross offers

Chart showing Gross Generation and Load (MW) on left axis (0 to 160) and Net-to-Grid Generation and Load (MW) on right axis (-40 to 120). Categories: Gross Offers, Gross Dispatch, On-Site Load, STS NTG, DTS NTG.
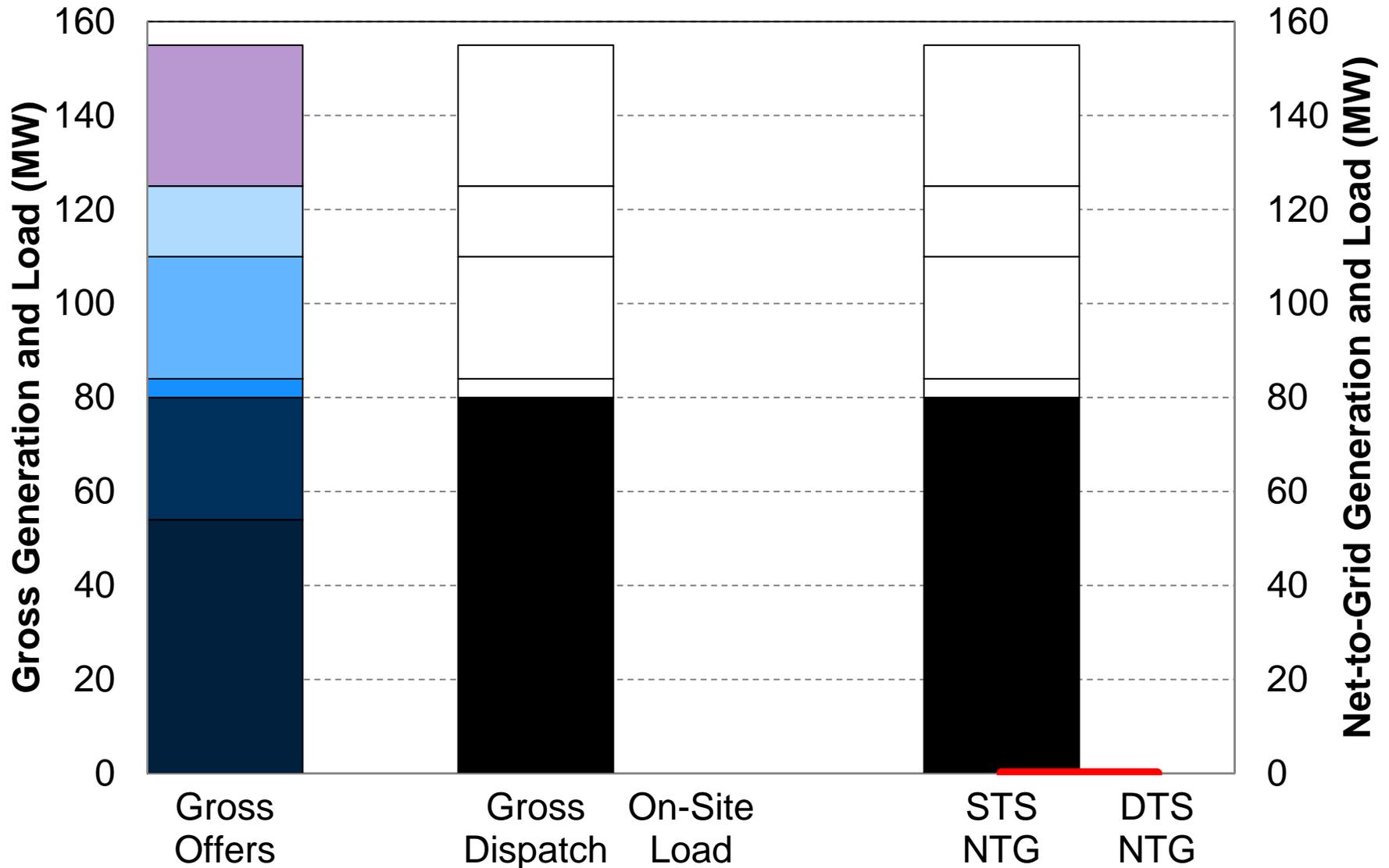
Net-to-grid merit order simulation has several impacts

- Merit order volumes align with volumes to which loss factors are applied

- Some behind-the-fence facilities can be removed from the base case topologies

- On-site generation and on-site load are assumed to be part of an integrated process

  - If generation is dispatched off, load is also removed

  - In the loss factor calculation methodology, load supplied by on-site generation will not be supplied by other sources when the on-site generation is removed from the system

- Merit order volumes are end-of-hour snapshots while measurement point volumes are hourly averages

Net-to-grid merit order simulation has several impacts (cont'd)

- Is a net-to-grid merit order simulation compliant with the Commission's direction to use energy market merit orders from the previous year?

- Are there other impacts that should be considered?

Alternative approaches to application of shift factor in loss factor calculation methodology

- In Decision 790-D03-2015 the Commission stated, "The Commission expects the AESO to address this matter [of when to apply a shift factor] in its compliance filing"

- In its Implementation Plan, the AESO state it expected to "apply a single shift factor to all average loss factors to ensure recovery of the forecast annual transmission system losses"

- During the technical meeting, the topic of annual versus hourly shift factors was further discussed

- In its Q1 Update, the AESO explained, "After discussing this matter with ENMAX following the technical meeting and undertaking a further examination of additional examples, the AESO considers it appropriate to use hourly shift factors"

AESO further discussed shift factor matters following Q1 Update

- In response to the Q1 Update, ATCO Power contacted the AESO about the AESO's conclusion and coordinated further discussions between the AESO, ATCO Power, ENMAX, and Milner Power

  – Discussions included review of a workbook example provided by ATCO Power

- Following these discussions, the AESO further examined the matter

- AESO is bringing matter to broader stakeholder group for discussion before addressing in Q2 Update

Shift factor allows recovery of correct amounts while maintaining economic signals

- As noted in Decision 790-D03-2015, "Any ILF method … will over recover the volume of losses and require that a shift factor be applied to each generator's loss factor in order to collect the correct amount of losses"

- In addition, the application of a common shift factor to all loss factors maintains economic signals by retaining the loss factor differentials between generators

  - All loss factors are shifted by a common amount

- Are there other matters that should be considered with respect to shift factors?

Over what time period should the correct amount of losses be recovered?

- Do shift factors need to be applied to collect the correct amount of losses on anything other than an annual basis?

  - Section 33(1) of the *Transmission Regulation* requires that "the actual cost of losses is reasonably recovered through charges and credits under the ISO tariff on an annual basis"

  - The AESO finds no legislative requirements to collect the correct amount of losses on any other basis

  - As a single loss factor must apply at each location for a minimum period of one year, there seems no need to consider the amount of losses collected in a shorter period

- The AESO concludes it is not necessary to attempt to collect the correct amount of losses on an hourly basis

AESO used Excel model to examine impacts of hourly shift factors

- Would hourly shift factors better maintain economic signals by retaining the loss factor differentials between generators?
- AESO used ATCO Power workbook to examine impacts
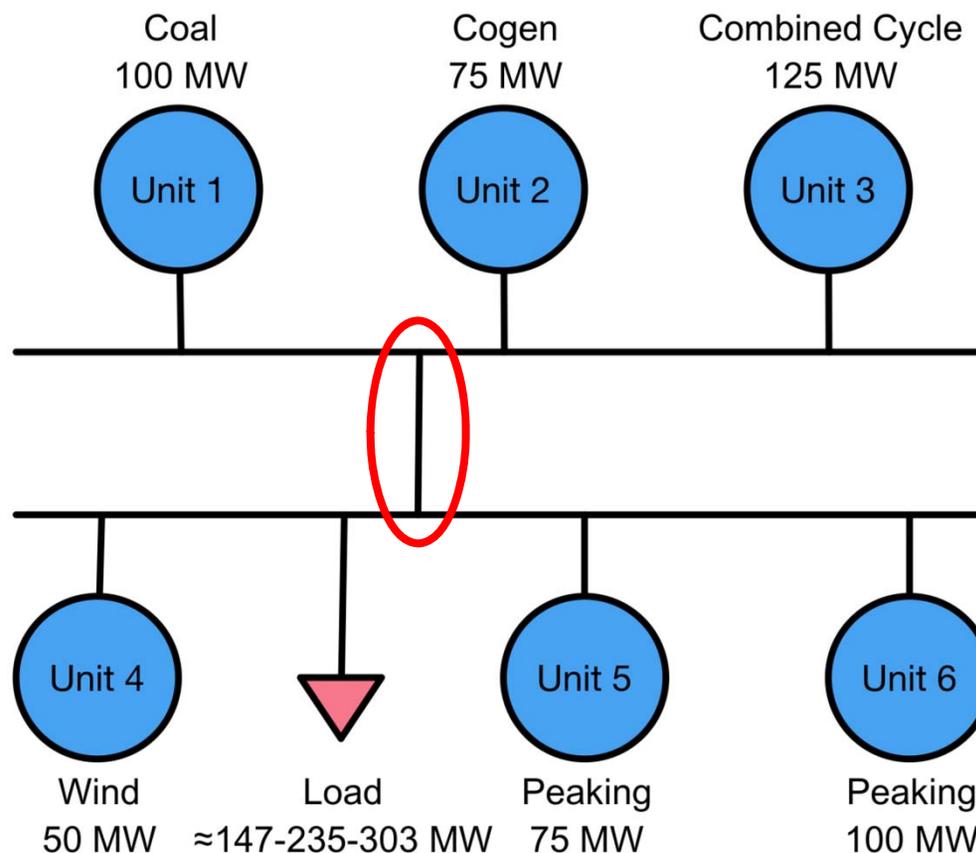
Raw loss factors were calculated under three scenarios

aeso
ALBERTA
ELECTRIC
SYSTEM
OPERATOR

Generating Unit	Low Load Scenario ≈147 MW	Medium Load Scenario ≈235 MW	High Load Scenario ≈303 MW
Unit 1: 100 MW	0.0%	3.2%	15.0%
Unit 2: 75 MW	0.0%	0.0%	15.8%
Unit 3: 125 MW	NA	12.0%	14.3%
Unit 4: 50 MW	-7.5%	-14.3%	NA
Unit 5: 75 MW	NA	NA	0.0%
Unit 6: 100 MW	NA	NA	0.0%

"NA" indicates generating unit was not dispatched and no loss factor applies in scenario

Differentials between loss factors were examined under different shift factors

- Raw loss factors were calculated for each generator that was dispatched under each of three hourly load scenarios

  – If a generator was not dispatched, there was no loss factor for that generator in that hour

- Differentials between loss factors were then calculated

  – As average differentials between raw loss factors in each hour

  – As differentials between final loss factors determined using single annual shift factor

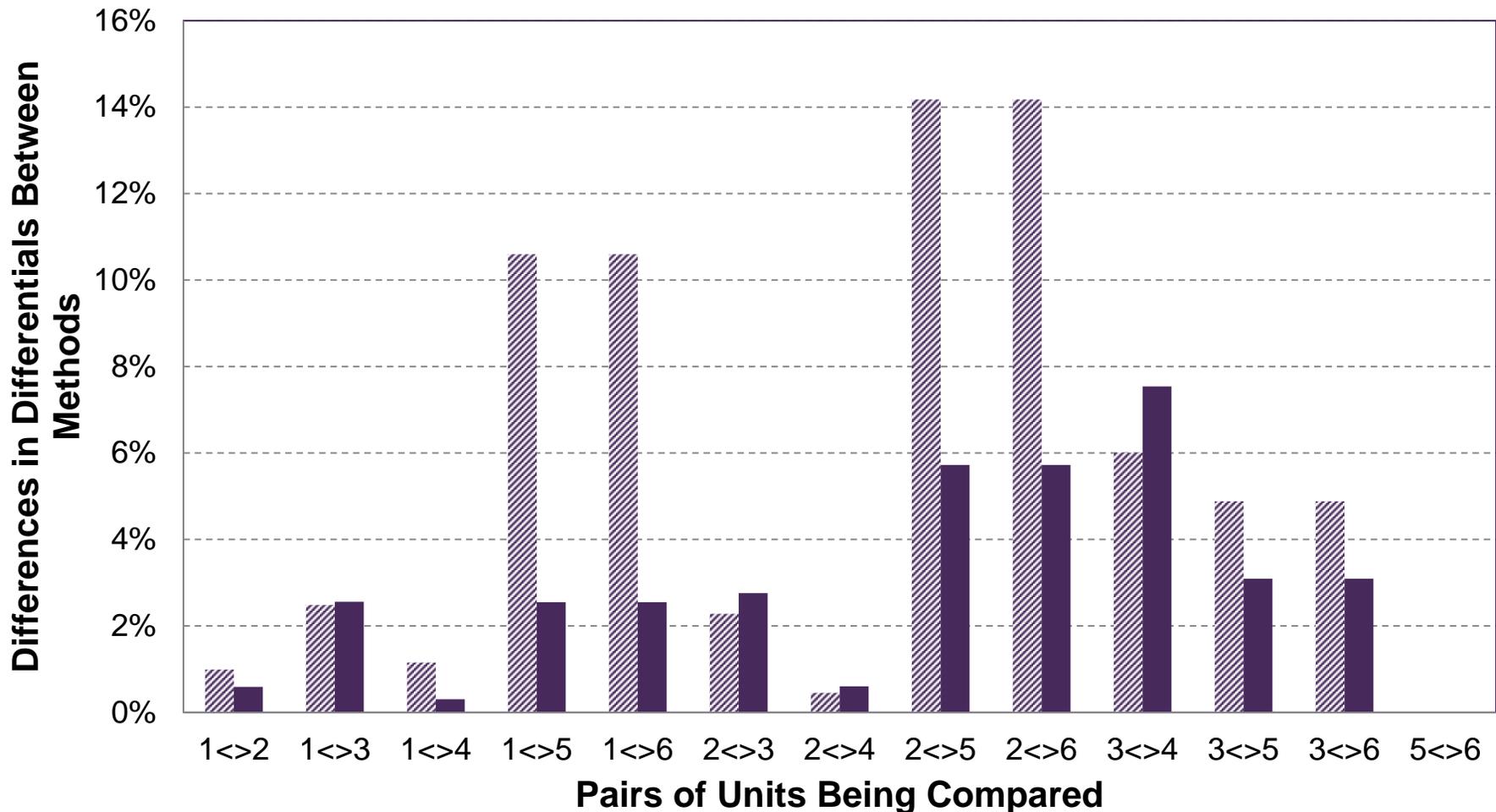 – As differentials between final loss factors determined using hourly and annual shift factors

Differentials between loss factors varied between methods

Pairs of Units Being Compared	Differentials Between Raw Loss Factors	Differentials Using Single Annual Shift Factor	Differentials Using Hourly Plus Annual Shift Factors
Unit 1 ⇔ Unit 2	1.8%	2.8%	2.4%
Unit 1 ⇔ Unit 3	7.4%	5.0%	4.9%
Unit 1 ⇔ Unit 4	14.1%	15.3%	13.8%
Unit 1 ⇔ Unit 5	15.0%	4.4%	12.5%
Unit 1 ⇔ Unit 6	15.0%	4.4%	12.5%
Unit 2 ⇔ Unit 3	10.1%	7.8%	7.3%
Unit 2 ⇔ Unit 4	12.0%	12.5%	11.4%
Unit 2 ⇔ Unit 5	15.8%	1.6%	10.0%
Unit 2 ⇔ Unit 6	15.8%	1.6%	10.0%
Unit 3 ⇔ Unit 4	26.3%	20.2%	18.7%
Unit 3 ⇔ Unit 5	14.3%	9.4%	17.3%
Unit 3 ⇔ Unit 6	14.3%	9.4%	17.3%
Unit 4 ⇔ Unit 5	NA	10.9%	1.4%
Unit 4 ⇔ Unit 6	NA	10.9%	1.4%
Unit 5 ⇔ Unit 6	0.0%	0.0%	0.0%

Differentials were better maintained when annual and hourly shift factors were used

Differences Between Raw Loss Factor and Single Annual Shift Factor Methods

Differences Between Single Annual and Hourly Plus Annual Shift Factor Methods

AESO proposes to use both hourly and annual shift factors

- AESO proposes to use both hourly and annual shift factors to maintain economic signals by retaining the loss factor differentials between generators

  – As proposed in Q1 Update
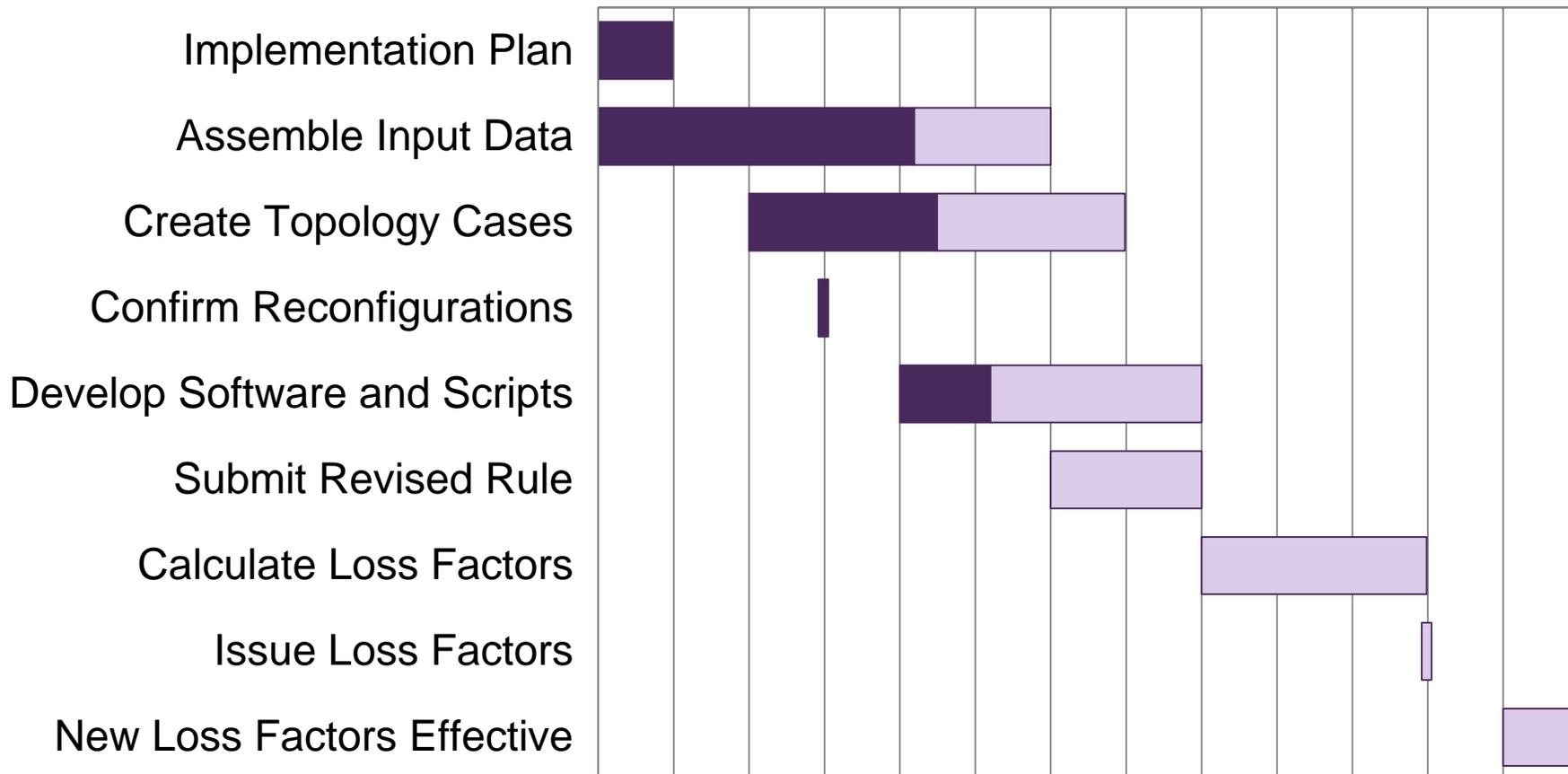
- Any comments from stakeholders?

Update on implementation plan progress

Progress has slipped somewhat but rule timeline remains achievable

- AESO expects to submit revised rule in Q3

- Additional comments will be provided in Q2 Update to be submitted at end of June

Discussion and questions

Thank you