

Technical Meeting on Loss Factor Activities

February 17, 2021 — Calgary, Alberta

AESO Engineering, Project
Management & Technology

- All attendees will join the meeting in listen-only mode, with attendee cameras disabled and microphones muted.
- When asking or typing in a question, **please state your first and last name and the organization you represent.**
- Two ways to ask questions during the presentation if you are accessing the meeting using your computer or smartphone:
 - You can **click the icon to raise your hand** and the host will see that you have raised your hand. The host will unmute your microphone. You in turn will need to unmute your microphone and then you can ask your question. Your name will appear on the screen but your camera will remain turned off.
 - You can also ask questions by **typing them into the Q&A window**. Click the “Q&A” button next to “Raise Hand.” You’re able to up-vote questions that have been already asked.

- Using a 2-in-1/PC/Mac computer:
 - Hover your cursor over the bottom area of the Zoom window and the Controls will appear.
 - Click “Raise Hand” and the host will be notified that you would like to ask a question.
 - Click “Lower Hand” to lower it if needed.
 - You can also ask questions by tapping the “Q&A” button and typing them in. You’re able to up-vote questions that have been already asked.

- Using the Zoom app on a smartphone:
 - Tap “Raise Hand.” The host will be notified that you've raised your hand.
 - Tap “Lower Hand” to lower it if needed.
 - You can also ask questions by tapping the “Q&A” button and typing them in. You’re able to up-vote questions that have been already asked.

- If you are accessing the webinar via conference call:
 - If you would like to ask a question, on your phone's dial pad, hit *9 and the host will see that you have raised your hand. The host will unmute your microphone, you in turn will need to unmute your microphone by hitting *6 and then you can ask your question. Your number will appear on the screen.
- Phone controls for attendees:
 - To raise your hand, on your phone's dial pad, hit *9. The host will be notified that you've raised your hand.
 - To toggle between mute and unmute, on your phone's dial pad, hit *6.

The background of the slide is a blue-tinted image. It features a close-up of two hands shaking in a firm grip, symbolizing agreement or partnership. In the background, a city skyline is visible, with a prominent power transmission tower on the right side. A network of thin white lines connects various points across the image, suggesting a global or interconnected theme.

OUR ENGAGEMENT PRINCIPLES

Inclusive and Accessible

Strategic and Coordinated

Transparent and Timely

Customized and Meaningful

- The participation of everyone here is critical to the engagement process. To ensure everyone has the opportunity to participate, we ask you to:
 - Listen to understand others' perspectives
 - Disagree respectfully
 - Balance airtime fairly
 - Keep an open mind

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- Introduction
- Overview of loss factor recalculation results for each year from 2009 to 2006
- Overview of loss charge adjustments resulting from 2009 to 2006 loss factor recalculations
- Status update on settlement of loss charge adjustments
- Discussion of remaining Module C settlement process
- Status update on other loss factor activities
- Questions and discussion

Ask questions to clarify information during presentation

- The purpose of the meeting is to provide information on the recalculated loss factors recently published by the AESO for 2009, 2008, 2007, and 2006 and the resulting adjustments that will be charged or refunded, as determined in accordance with Decision 790-D07-2019 of the Alberta Utilities Commission in Module C of Proceeding 790
- Some information on other loss factor activities will also be provided

- Ping-Kwan Keung, Manager, Standards & Modeling
- John Martin, Senior Special Projects Advisor
- Milton Castro-Núñez, Senior Engineer
- Brittany Dugas, Engineer in Training
- Ena Gibbons, Senior Credit & Settlement Analyst
- Trushal Umrana, Project Manager
- Andrea Lamy, Legal Counsel, Legal & Regulatory Affairs
- Keith Miller, Keith Miller Law, External Legal Counsel

Stantec meeting representative

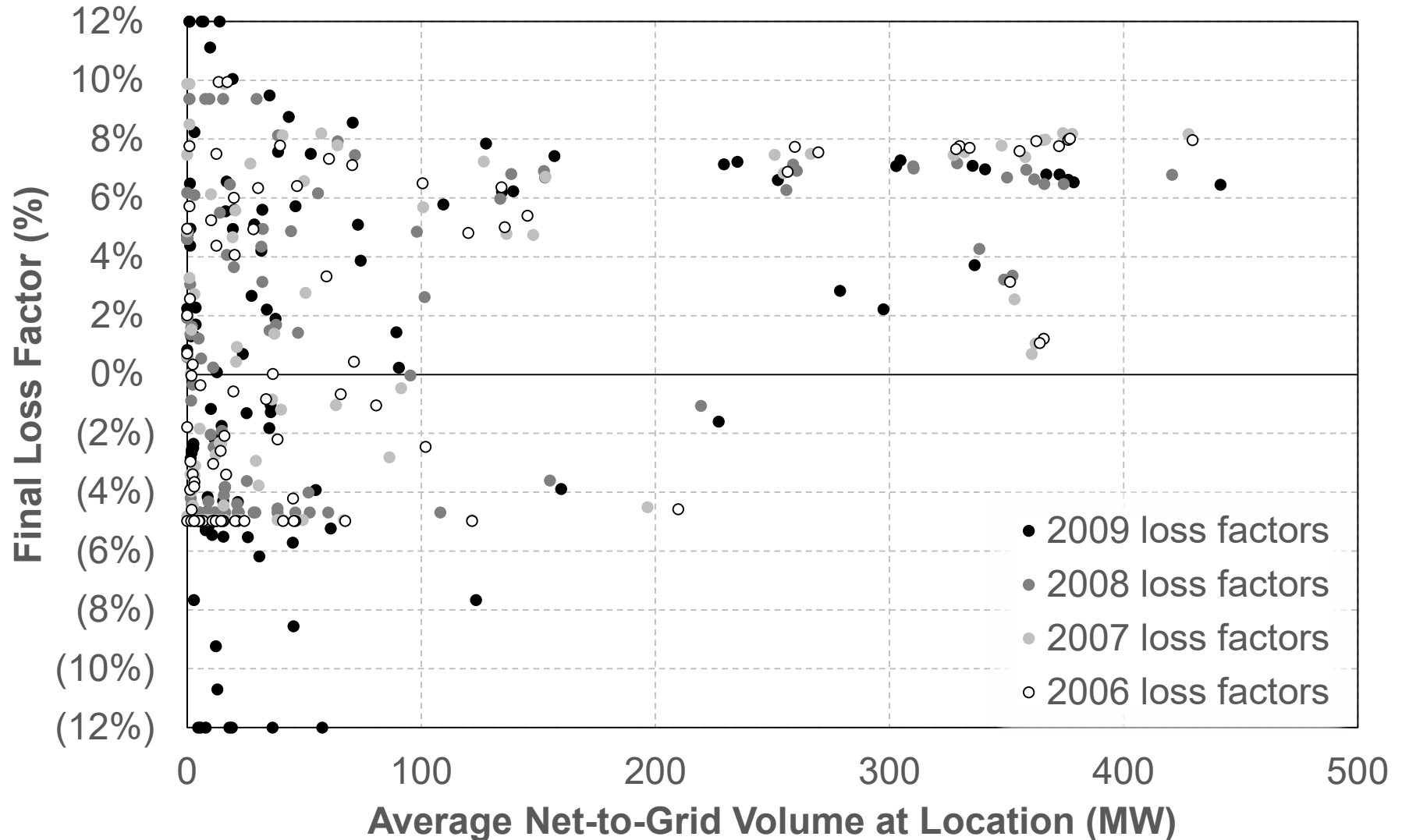
- Ashikur Bhuiya, Senior Supervising Engineer, Stantec Consulting

- Balancing Pool
- Capital Power
- City of Medicine Hat
- DePal Consulting Limited
- Dow Canada
- ENMAX Corporation
- Heartland Generation Ltd.
- Lionstooth Energy
- Milner Power Inc.
- PGSC
- Powerex
- Suncor Energy Inc.
- TC Energy (TransCanada)
- TransAlta Corporation

AESO published 2009, 2008, 2007, and 2006 loss factors on Dec 9 – Jan 29

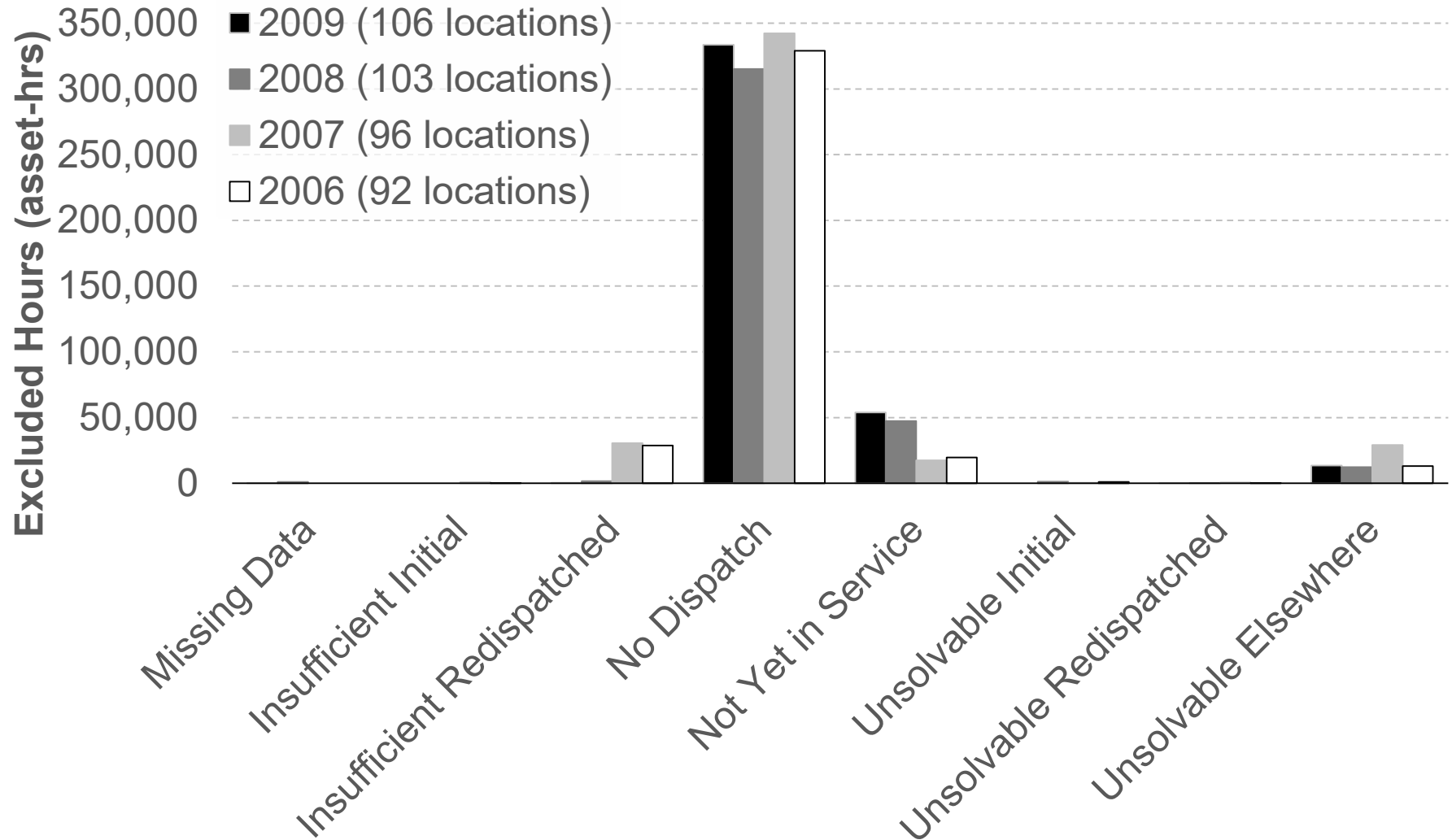
- Loss factors were calculated in accordance with Modified Module B methodology approved in Decision 790-D07-2019 on the AESO Module C methodology compliance filing
- Related information was posted with loss factors
 - Hourly merit order data
 - Sample of hourly load data
 - Process for requesting access to system topologies
 - Updated procedure to determine transmission system losses for loss factor calculations
 - Software and scripts used to calculate hourly raw loss factors
 - Workbook showing calculations for loss factors
- Base case suites are also available with solved initial state base cases for 144-hour sample of hourly load data

Annual loss factors continue to show greater dispersion for smaller volumes

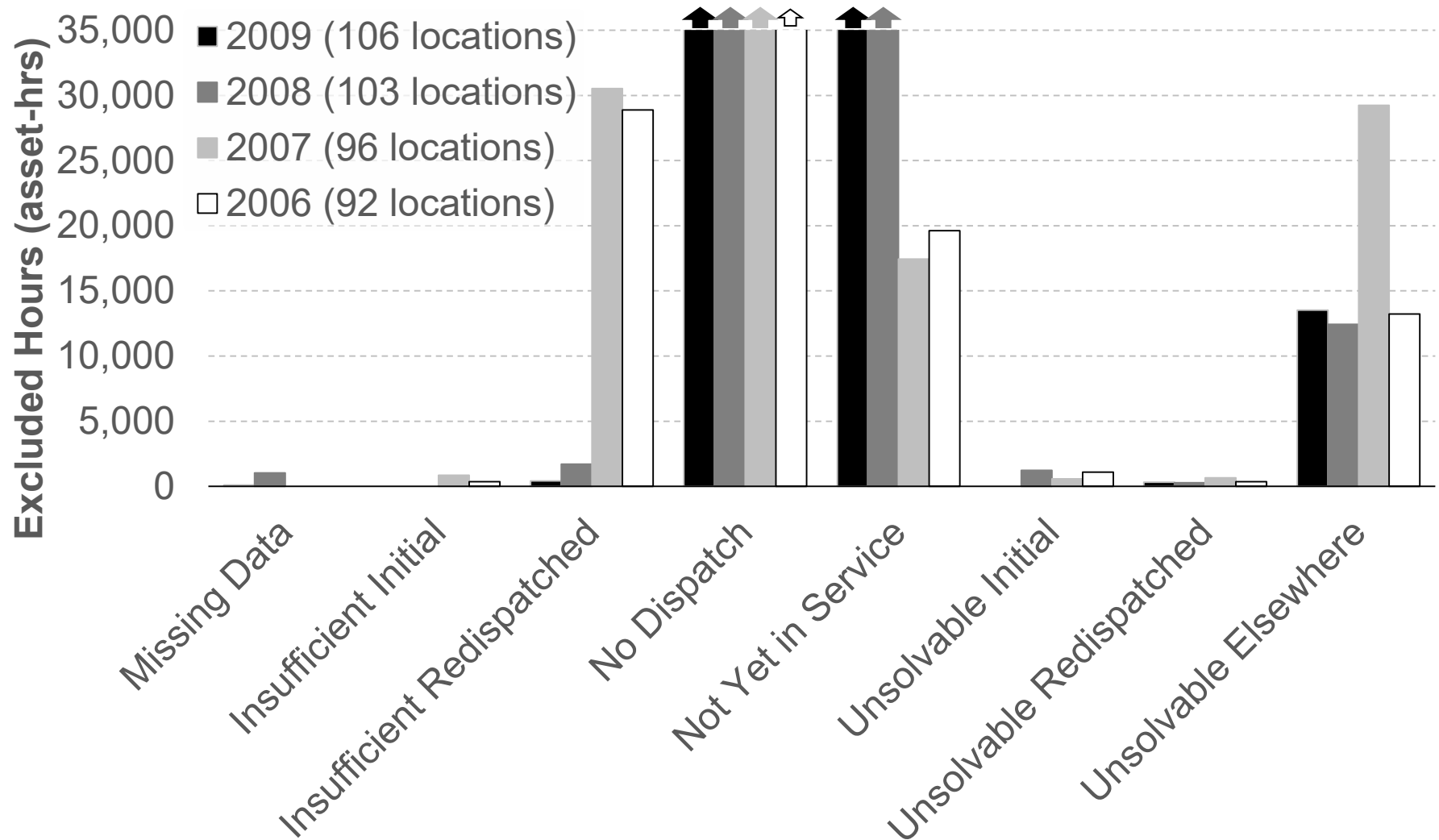


Note: Loss factor limits in 2008-2006 were $-1\times$ and $+2\times$ average loss factor

More hours were excluded in 2007 and 2008 than in 2009 and 2006

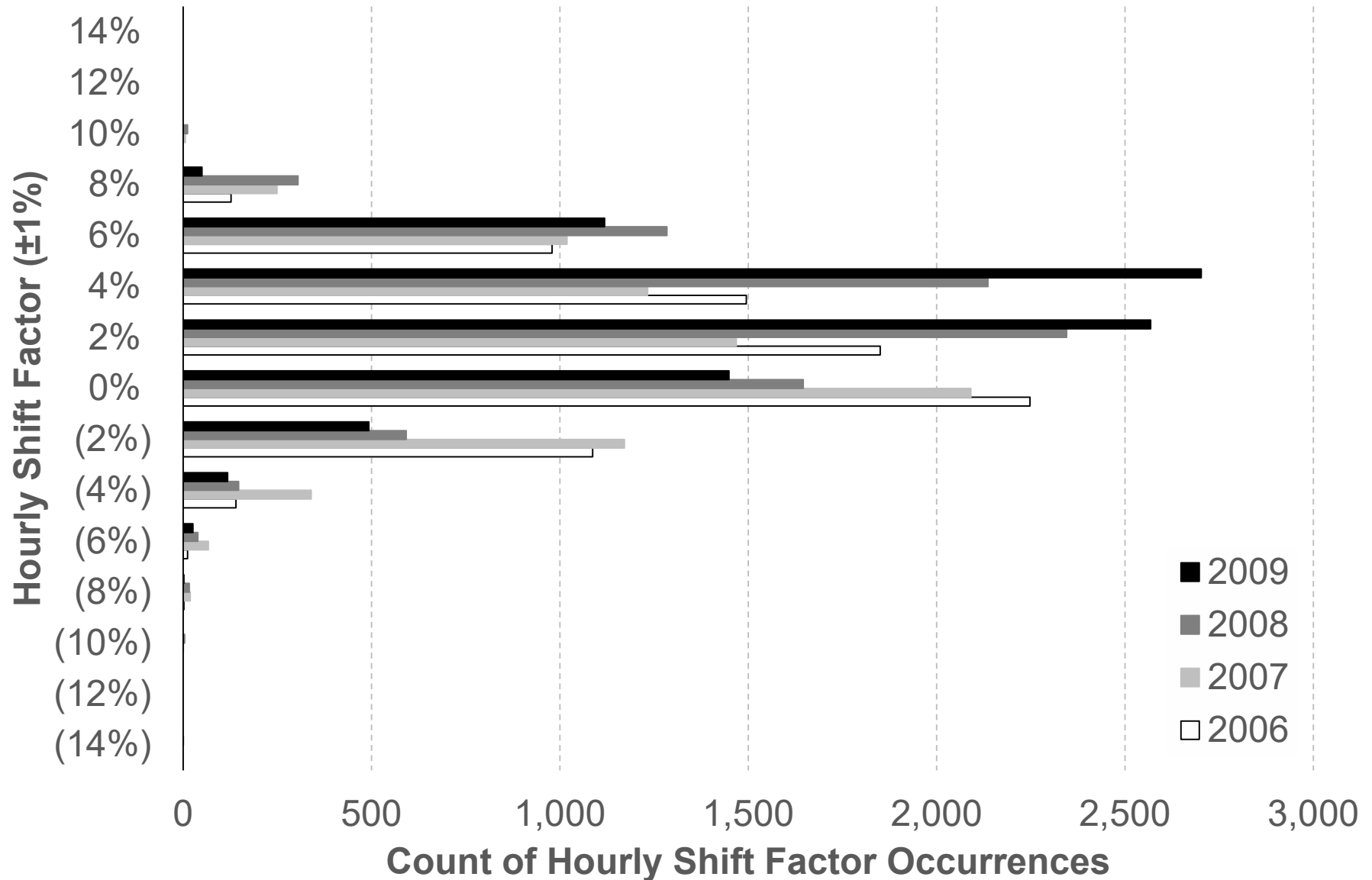


2% of hours were unsolvable in 2009 and 2008, 7% in 2007, and 5% in 2006

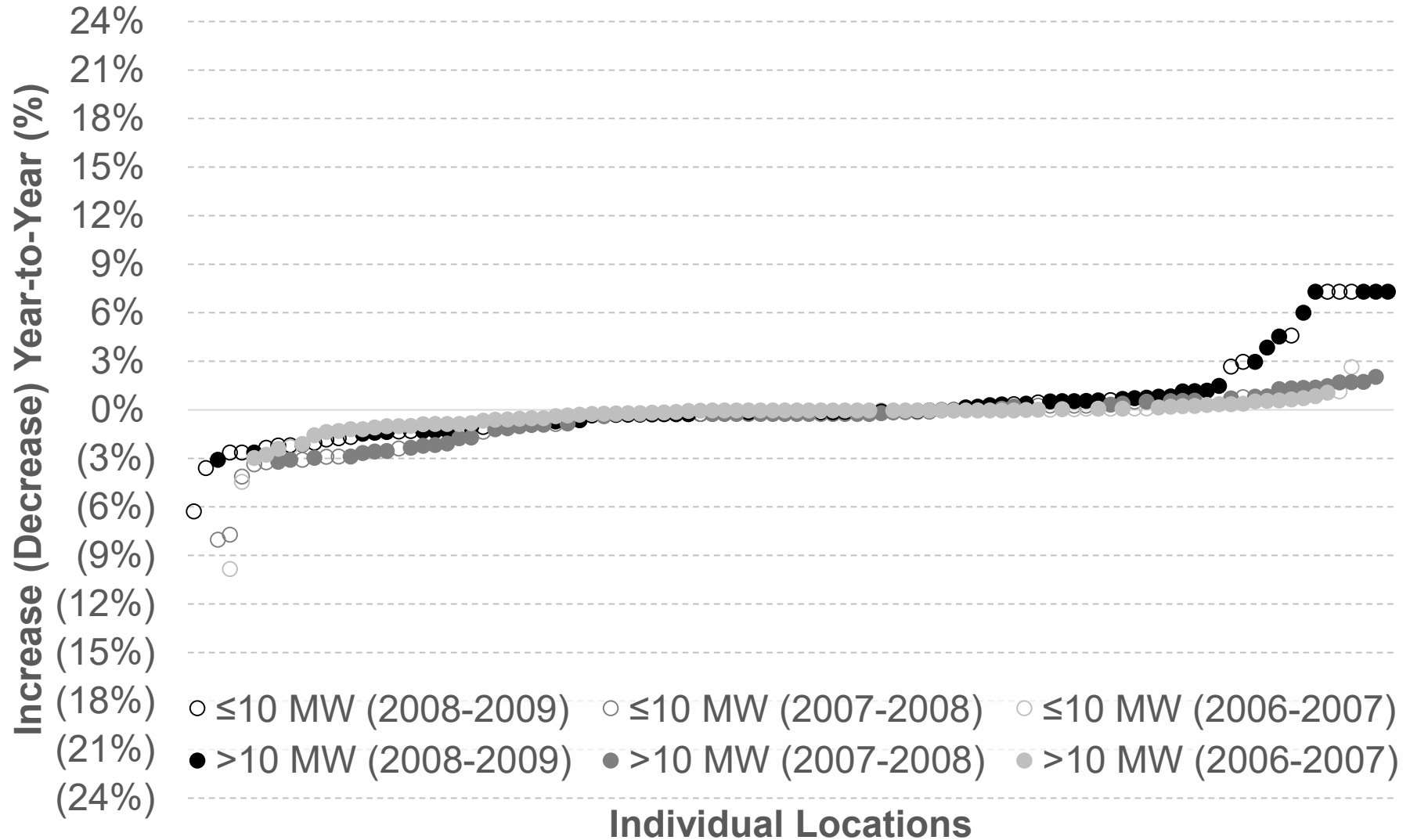


Note: 2% to 7% unsolvable hours were calculated excluding “no dispatch” and “not yet in service” hours

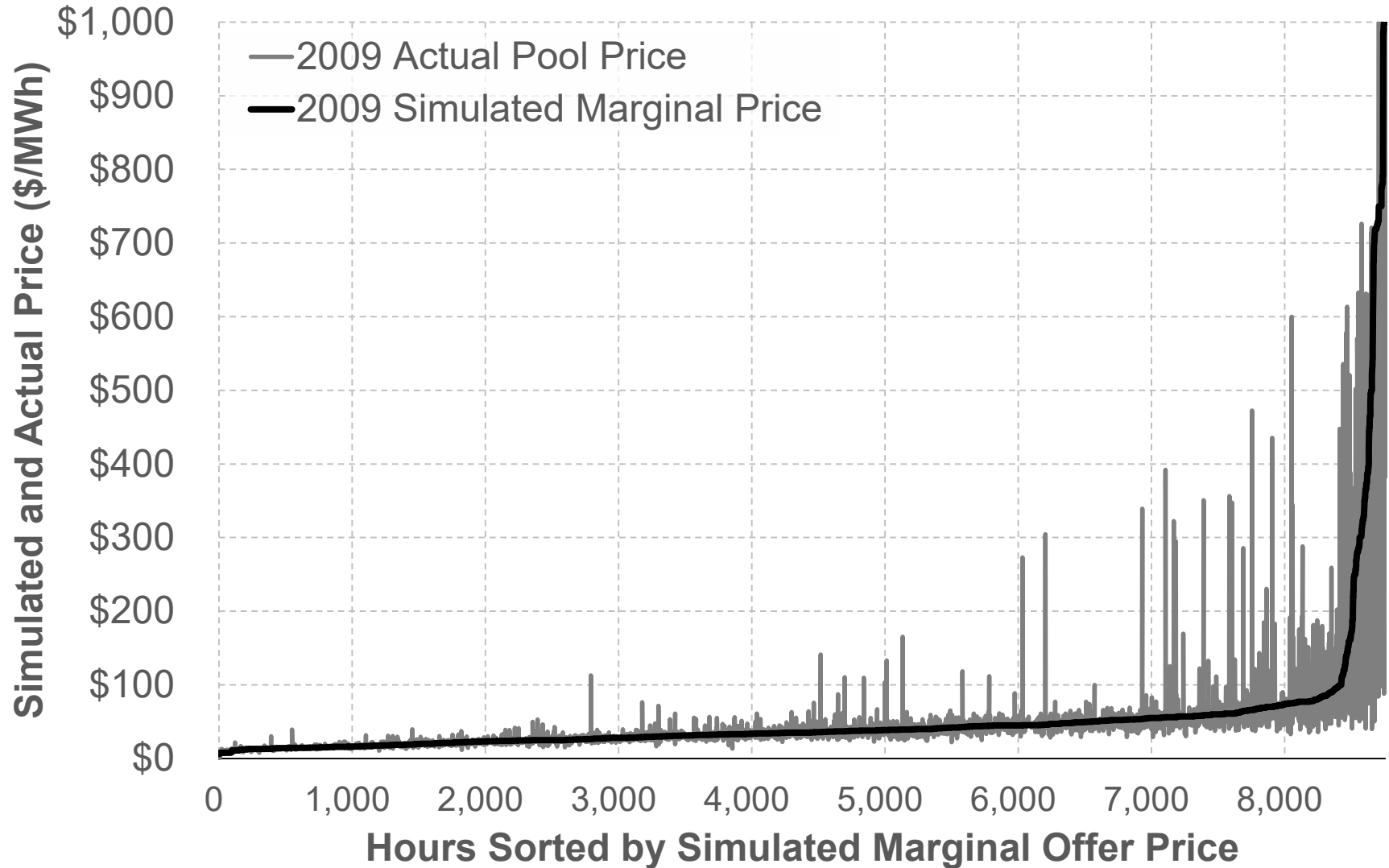
From 91% to 98% of hourly shift factors are between (2%) and 6% in each year



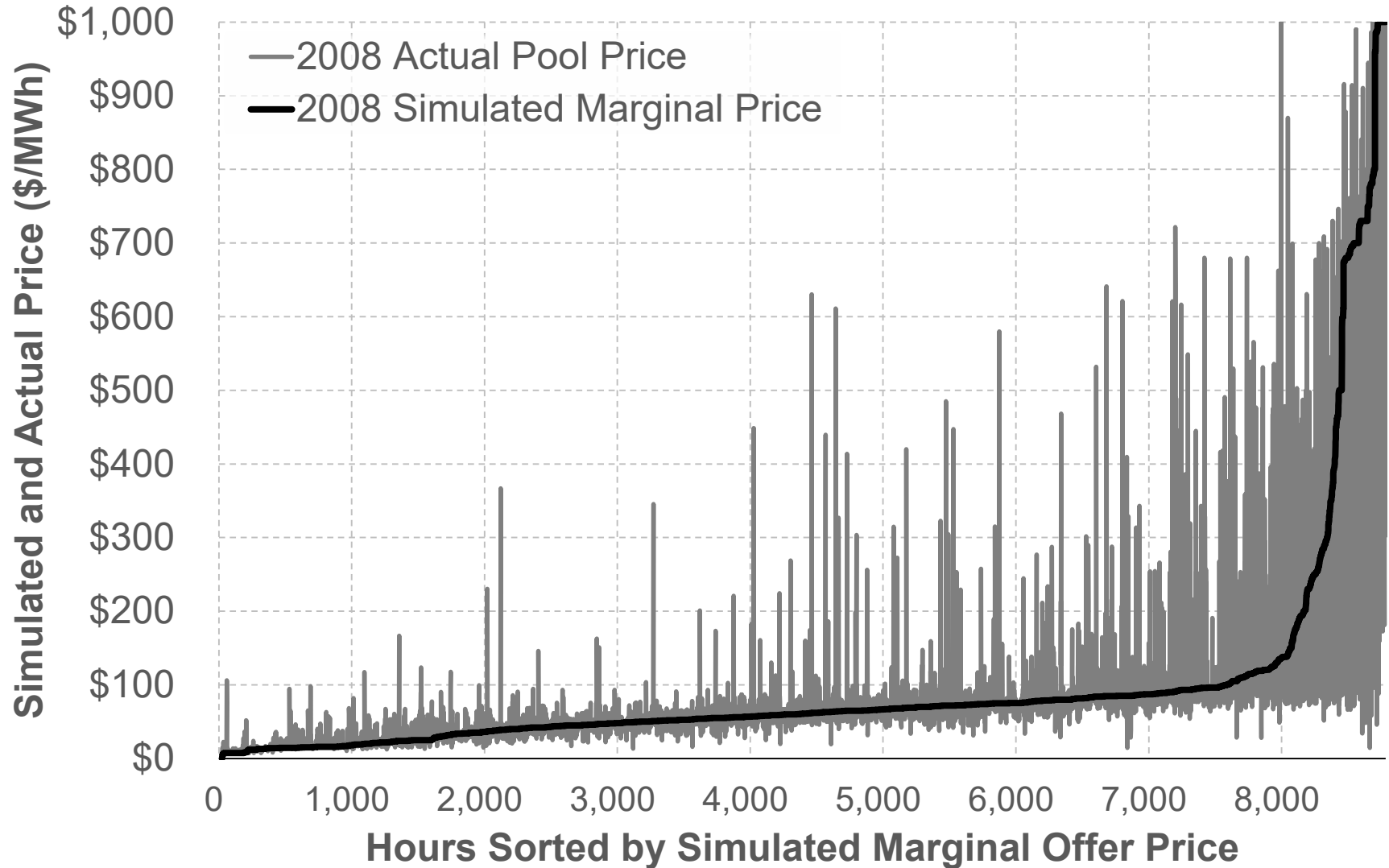
Over 90% of year-to-year loss factor changes are within $\pm 3\%$



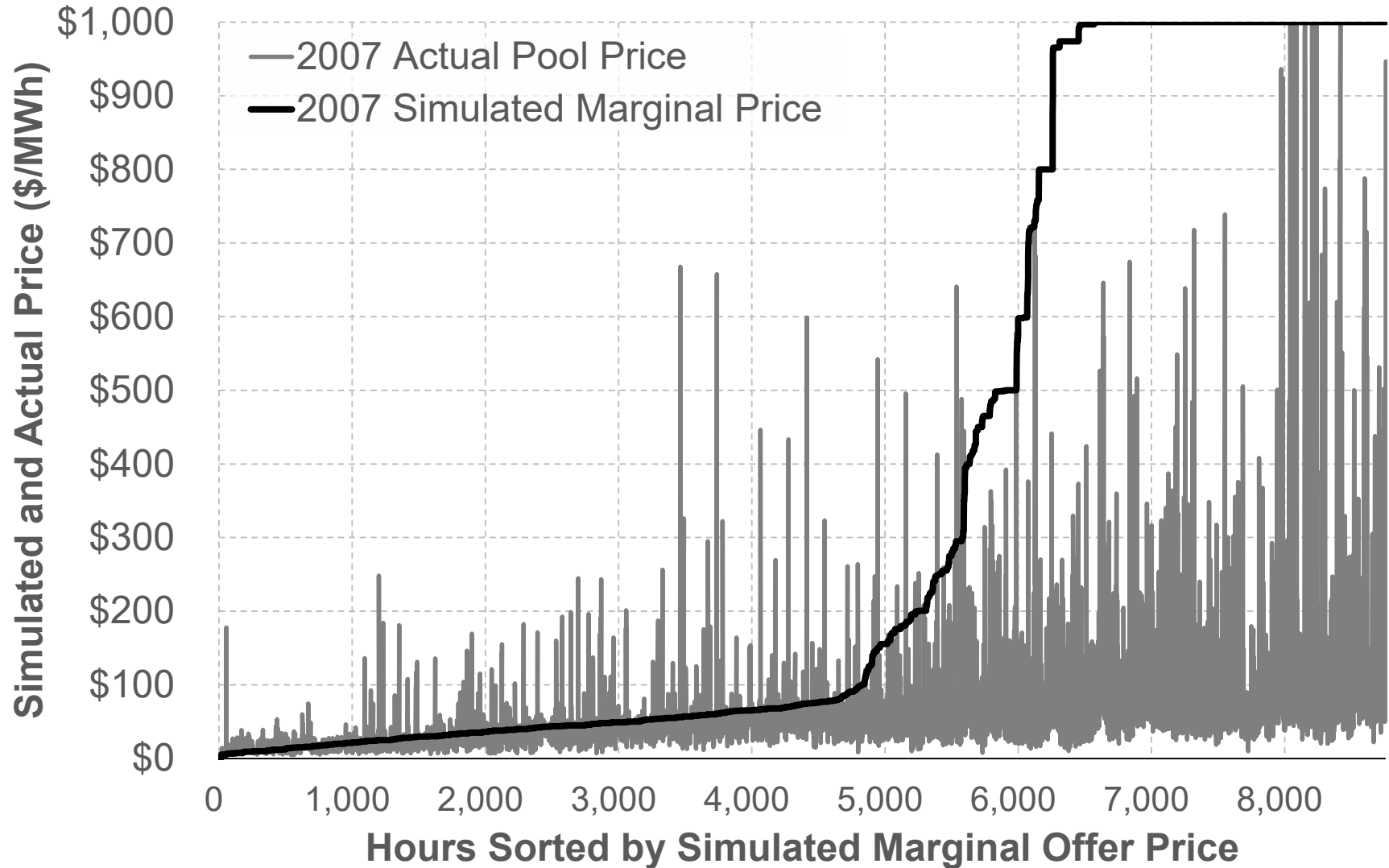
Simulated marginal offer price varied from actual pool price in 5% of 2009



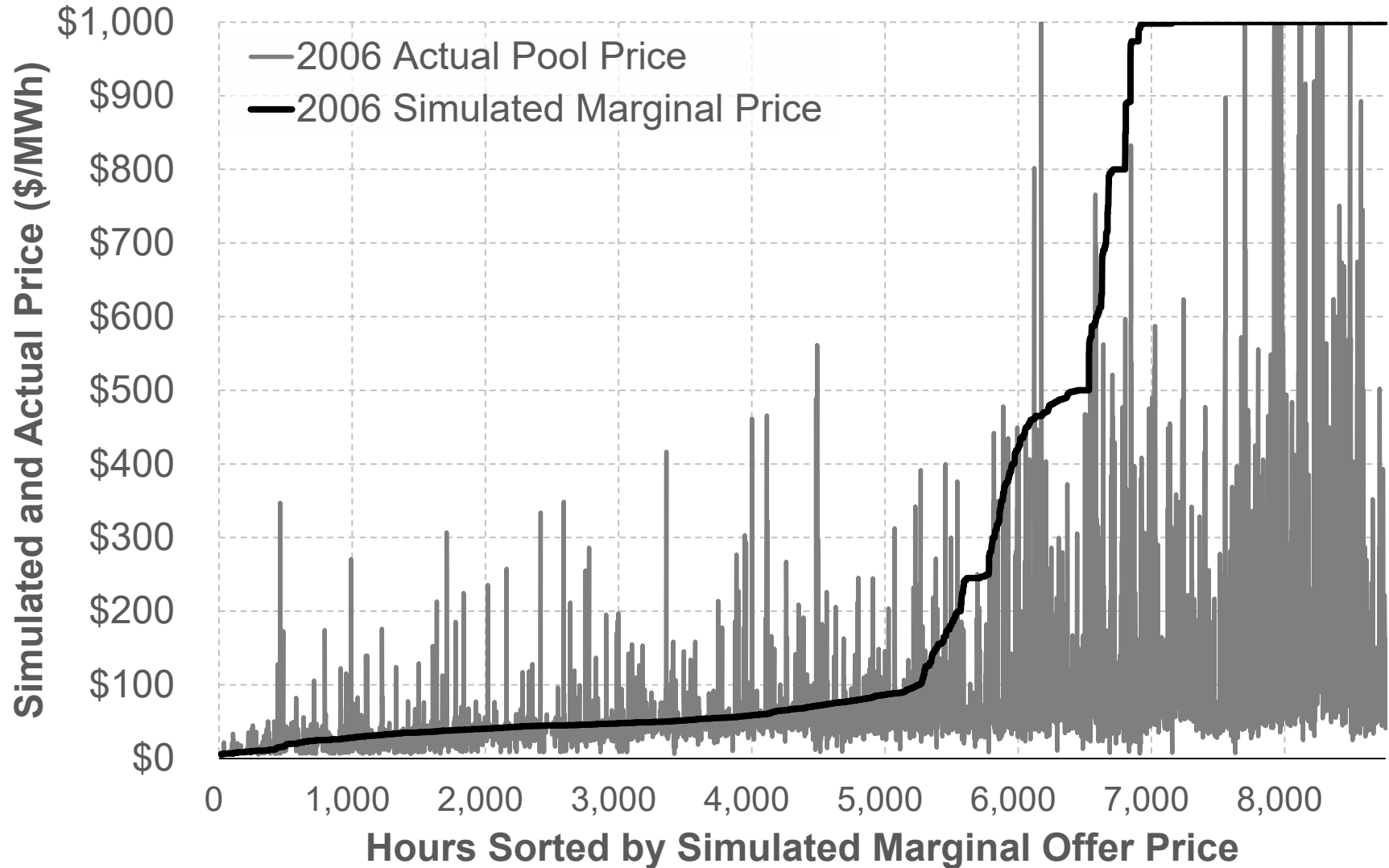
Simulated marginal offer price varied from actual pool price in 15% of 2008



Simulated marginal offer price varied from actual pool price in 52% of 2007



Simulated marginal offer price varied from actual pool price in 49% of 2006



Simulated marginal price varies from pool price due to changes during hour

- Simulated marginal offer price assumes steady-state conditions during an hour
- Actual pool price is affected by price changes within an hour arising from a variety of factors
 - Market participant restatements within the hour
 - Price responsive load dropping off or picking up
 - Wind generation increasing or decreasing
 - Intertie dispatch changes
 - High offer price differences for smaller dispatch volumes (as much as \$500/MWh over 50 MW of dispatch)
 - Generation dispatch changes during sharp ramp up and ramp down events due to net demand variability
 - In-merit available power changes resulting from derates

Most-frequent marginal units can be in different areas in different years

2009 Marginal Units			2008 Marginal Units		
Location	Hours	Area	Location	Hours	Area
Sheerness #2	1,286	Sheerness	Sheerness #2	829	Sheerness
Sheerness #1	1,122	Sheerness	Sheerness #1	828	Sheerness
Calgary Energy Centre	806	Calgary	Dow Complex	702	Fort Saskatchewan
Cavalier	587	Strathmore	Calgary Energy Centre	690	Calgary
Battle River #5	524	Alliance	Cavalier	656	Strathmore
Sundance #2	427	Lake Wabamun	Battle River #5	610	Alliance
Dow Complex	407	Fort Saskatchewan	City of Medicine Hat	408	Medicine Hat
Sundance #6	407	Lake Wabamun	Sundance #6	352	Lake Wabamun
Sundance #1	385	Lake Wabamun	Nexen Inc. #1	314	Calgary
City of Medicine Hat	349	Medicine Hat	Sundance #3	310	Lake Wabamun
Sundance #5	311	Lake Wabamun	Sundance #5	281	Lake Wabamun
Nexen Inc. #1	276	Calgary	Suncor Industrial System	279	Fort McMurray
Battle River #4	181	Alliance	Scotford Industrial System	263	Fort Saskatchewan
Battle River #3	153	Alliance	Battle River #3	212	Alliance
Genesee #3	144	Lake Wabamun	Fort Nelson	201	Rainbow Lake
Muskeg River	142	Fort McMurray	Battle River #4	192	Alliance
Suncor Industrial System	132	Fort McMurray	Muskeg River	186	Fort McMurray
Northern Prairie Power	128	Grande Prairie	Joffre Industrial System	164	Red Deer
Joffre Industrial System	126	Red Deer	Sundance #2	139	Lake Wabamun
Scotford Industrial System	112	Fort Saskatchewan	Clover Bar #1	131	Edmonton

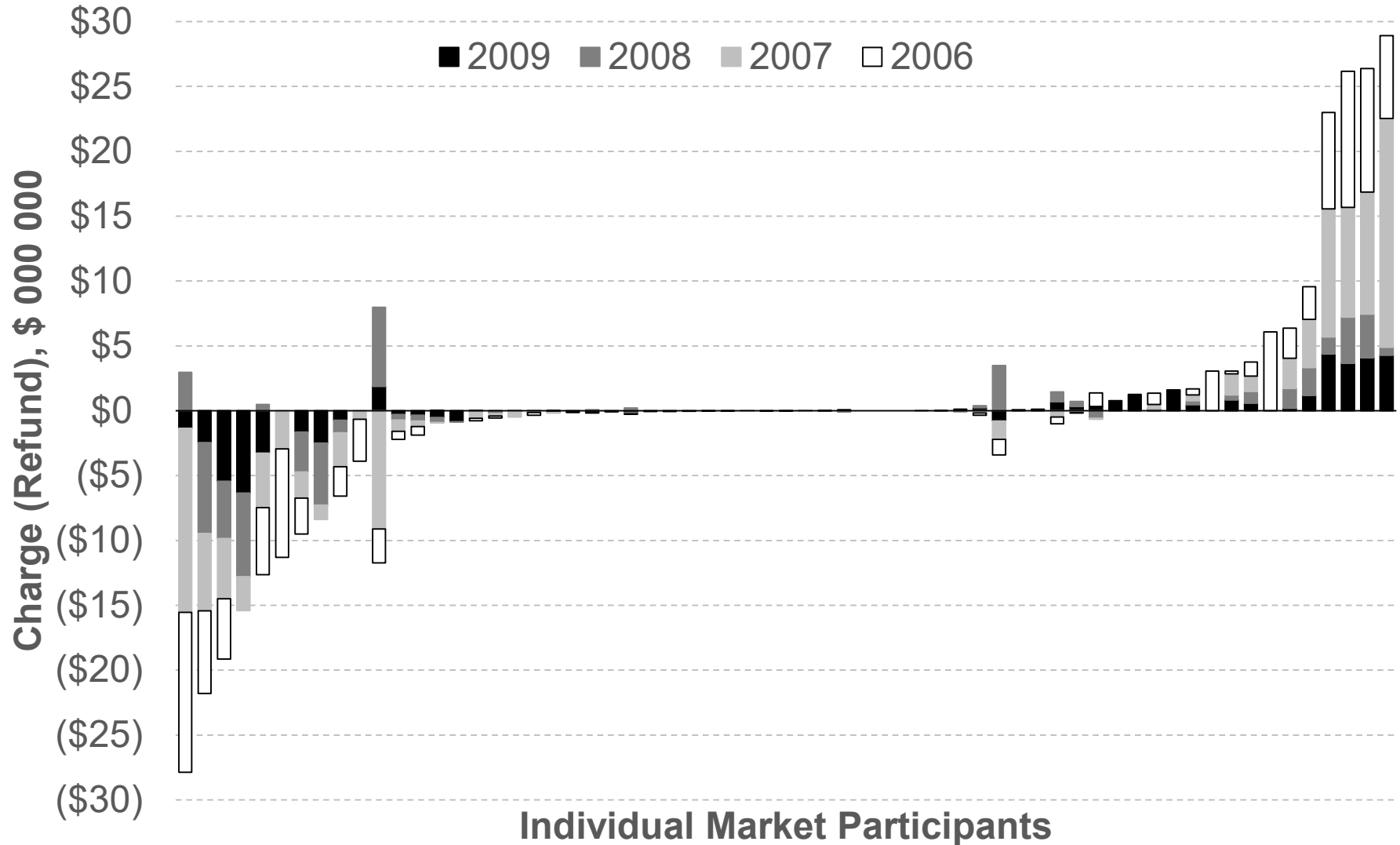
Most-frequent marginal units can be in different areas in different years (cont'd)

2007 Marginal Units			2006 Marginal Units		
Location	Hours	Area	Location	Hours	Area
Brazeau Hydro Facility	1,113	Drayton Valley	Calgary Energy Centre	1,008	Calgary
Calgary Energy Centre	697	Calgary	Brazeau Hydro Facility	954	Drayton Valley
Sheerness #1	628	Sheerness	Sheerness #1	758	Sheerness
Sheerness #2	623	Sheerness	Sheerness #2	653	Sheerness
Battle River #5	469	Alliance	Nexen Inc. #1	481	Calgary
Sundance #2	414	Lake Wabamun	Sundance #4	414	Lake Wabamun
Nexen Inc. #1	360	Calgary	Sundance #1	403	Lake Wabamun
Sundance #3	340	Lake Wabamun	Suncor Industrial System	317	Fort McMurray
Alberta-BC Intertie - Export	323	WSCC	Valleyview #1	277	Valleyview
Scotford Industrial System	280	Fort Saskatchewan	Joffre Industrial System	269	Red Deer
Carseland	271	Strathmore	Sundance #3	267	Lake Wabamun
Joffre Industrial System	268	Red Deer	Muskeg River	260	Fort McMurray
Suncor Industrial System	265	Fort McMurray	Genesee #3	259	Lake Wabamun
Valleyview #1	246	Valleyview	Carseland	255	Strathmore
Poplar Hill #1	237	Grande Prairie	Battle River #5	253	Alliance
Sundance #6	204	Lake Wabamun	Scotford Industrial System	231	Fort Saskatchewan
Genesee #3	189	Lake Wabamun	Poplar Hill #1	193	Grande Prairie
Sundance #4	184	Lake Wabamun	Sundance #2	175	Lake Wabamun
Redwater	147	Fort Saskatchewan	Redwater	171	Fort Saskatchewan
Muskeg River	141	Fort McMurray	Battle River #3	150	Alliance

AESO published 2009-2006 Module C adjustments on Dec 21 – Jan 29

- Financial settlement process for third settlement period was delayed one month
 - Revised schedule was included in *Module C Settlement Procedure* posted on December 22 and updated on January 8
- Settlement statements for third settlement period will be issued in March 2021
 - Preliminary statements will be issued on March 5
 - Final statements will be issued on March 19
- Financial settlement for third settlement period is expected to occur on May 31, 2021

2009-2006 adjustments range from \$25 million refund to \$29 million charge



Note: Amounts include allocated interest

Commission has ordered use of simple interest calculation in Module C

- AESO requested guidance on whether interest attributable to monthly Module C amounts should be determined using compound interest or simple interest
 - AESO applied to Commission for guidance on November 13
- Commission ordered the AESO to use simple interest, in Decision 26084-D01-2021 issued on January 26, 2021
 - All Module C adjustments workbooks and settlement statements currently use simple interest

No Module C payment defaults occurred for first settlement period

- Financial settlement for first Module C settlement period (2016-2014) occurred on December 30, 2020
- No payment defaults occurred for first settlement period
- If Module C adjustments in second or third settlement period cannot be recovered or refunded, AESO may address resulting trailing amounts through adjustment of loss factors using Rider E in historical years
 - True-up process is discussed in *Module C Settlement Procedure*

Module C settlement schedule is included in *Procedure* document

Description	First Period 2016-2014	Second Period 2013-2010	Third Period 2009-2006
Publishing loss factors	May 2020	Early Nov 2020	Jan 2021
Publishing Module C adjustments	Sep 2020	Early Dec 2020	Jan 2021
Technical meeting	Jul 2020	Nov 2020	Feb 2021
Issuing statements	Oct 2020	Dec 2020	Mar 2021
Cash settlement	Dec 30, 2020	Mar 1, 2021	May 31, 2021

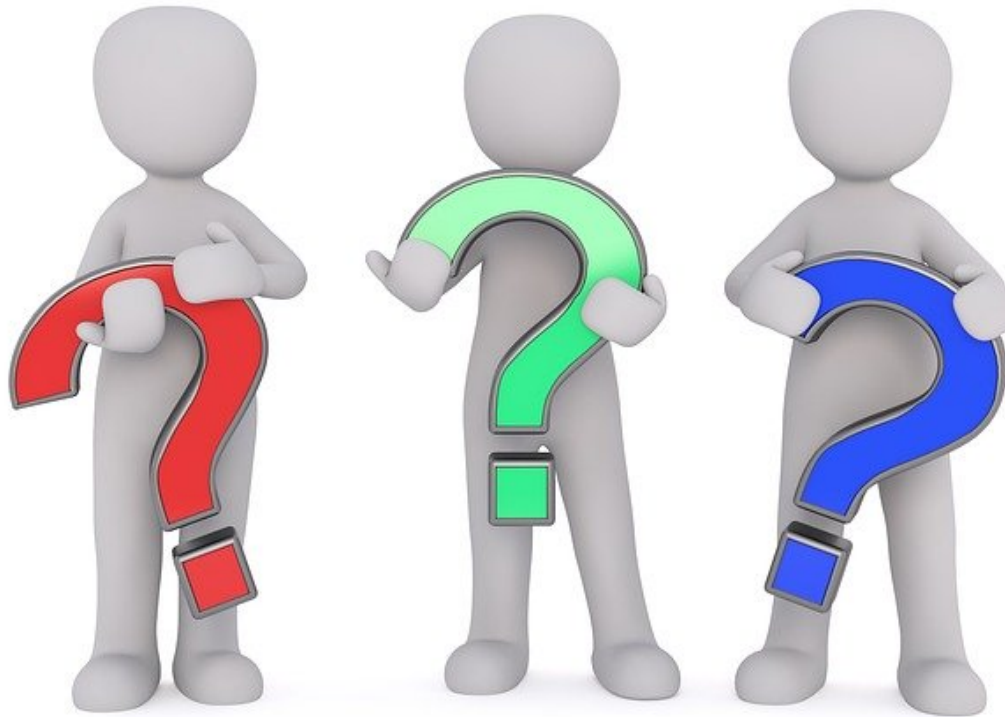
- Settlement schedule for Module C adjustments is included in *Module C Settlement Procedure* document posted on AESO website

- AESO published 2021 loss factors on November 30, 2020
 - Loss factors were updated on January 21 to include a location which did not originally satisfy project inclusion criteria
- Finalization of loss factor validation report was deferred due to resources being focused on 2021 loss factor development and Module C loss factor work
 - Report will be posted as soon as possible
- Stakeholder questions are included in this presentation

- City of Medicine Hat has identified concerns regarding system topologies, marginal unit capacity, missing generation volumes, and unstable raw loss factor calculations for the second settlement period
 - *AESO is reviewing the identified concerns and will determine next steps in the near future*
- TC Energy has requested information on treatment of available generating capacity that was not offered in energy market in 2006 to 2008, before “must offer” requirements
 - *Will be discussed during slides on 2008-2006 loss factor recalculation results*

- Some market participants have asked about differences between amounts in Module C adjustments workbooks and amounts in preliminary and final settlement statements
 - *AESO has updated Module C Settlement Procedure document to provide reasons for differences*
- Some market participants have asked specific questions about the settlement statements they have received
 - *AESO has responded to those questions directly*
- Some market participants have asked general questions
 - *AESO has responded to those questions, and there has been no specific concerns identified after the AESO's response*

- Some market participants have asked whether settlement process will continue while questions are being addressed
 - *AESO plans to continue the settlement process set out in the Module C Settlement Procedure document, unless an issue is identified that supports suspending that process*
 - *If such an issue is identified, the AESO will advise stakeholders through a notice posted on its website and included in its stakeholder newsletter*



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- Loss factors, stakeholder consultation information, and related documents are posted on AESO website
 - Grid ► Loss factors ► 2021 loss factors
 - Grid ► Loss factors ► Stakeholder engagement
 - Grid ► Loss factors ► Loss factors recalculation for 2006-2016



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Thank you