

Technical Meeting on Loss Factor Activities

July 15, 2020 — 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.

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

The information contained in this presentation is for information purposes only. While the AESO strives to make the information contained in this presentation as timely and accurate as possible, the AESO makes no claims, promises, or guarantees about the accuracy, completeness, or adequacy of the information contained in this presentation, and expressly disclaims liability for errors or omissions. As such, any reliance placed on the information contained herein is at the reader's sole risk.

- Introduction
- Overviews of 2016 to 2014 loss factor recalculation results
- Overview of loss charge adjustments resulting from 2016 to 2014 loss factor recalculations
- Potential process for settlement of loss charge adjustments
- Findings from investigation of volume discrepancies in loss factor calculations
- Status update for remaining Module C loss factor calculations
- Status update for 2021 loss factor calculations
- Review of overall schedule for 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 2016, 2015 and 2014 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.

- Dennis Frehlich, Vice President, Grid Reliability
- Marie-France Samaroden, Director, Engineering, Project Management & Technology
- Ping-Kwan Keung, Manager, Standards & Modeling
- John Martin, Senior Special Projects Advisor
- Milton Castro-Núñez, Senior Engineer
- Sabbir Ahmed, Engineer
- Andrea Lamy, Legal Counsel, Legal & Regulatory Affairs
- Alison Desmarais, Regulatory Administrator
- Keith Miller, Stikeman Elliott, external legal counsel
- Karla Anderson, Communications Advisor (Zoom support)

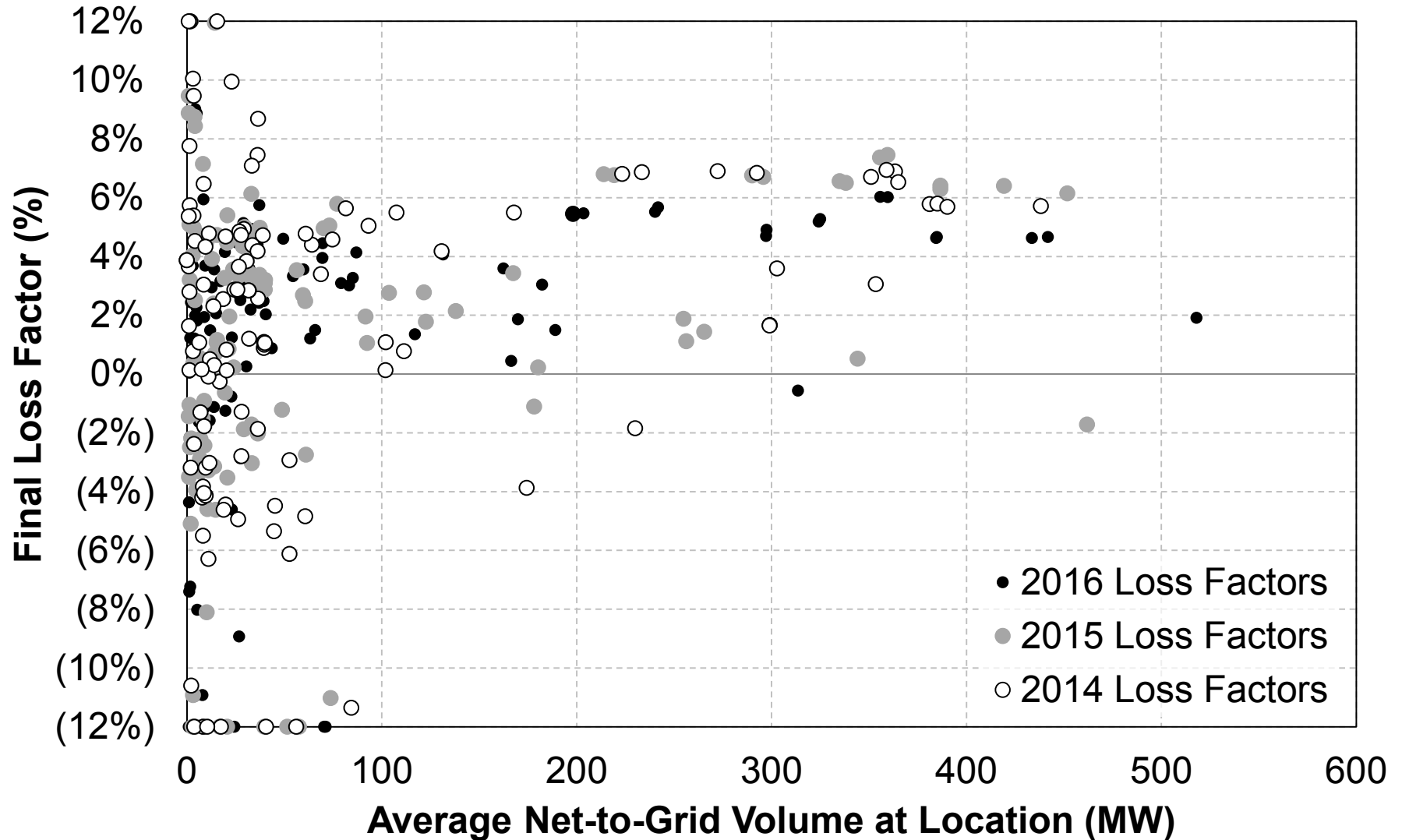
- Ashikur Bhuiya, Senior Supervising Engineer
- Ashraf Haque, Supervising Engineer
- Charley Rooney, Project Controller

- ADC
- Alberta Department of Energy
- Alberta Newsprint Company (ANC)
- Alberta Utilities Commission (AUC)
- AltaLink
- Balancing Pool
- Capital Power
- City of Medicine Hat
- CNOOC Petroleum NA
- Milner Power Inc.
- DePal Consulting Limited
- Elemental Energy
- Heartland Generation Ltd.
- Lionstooth Energy
- Maxim Power
- Market Surveillance Administrator (MSA)
- PGSC
- Powerex Corp.
- Suncor Energy Inc.
- TransAlta Corporation
- TransCanada (TC) Energy Ltd.

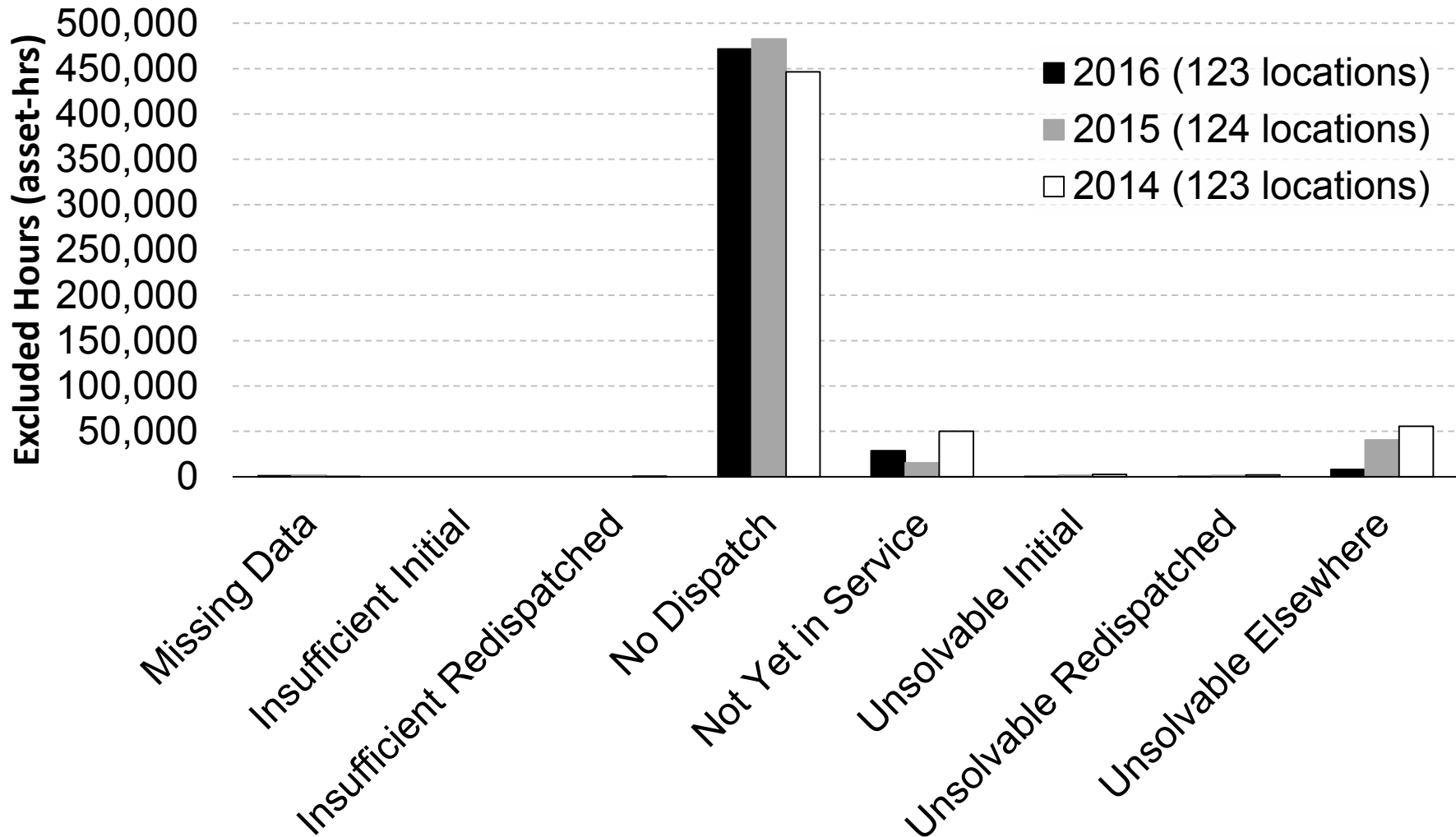
AESO published 2016, 2015, and 2014 loss factors on May 28-29, 2020

- 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 show greater dispersion for smaller volumes

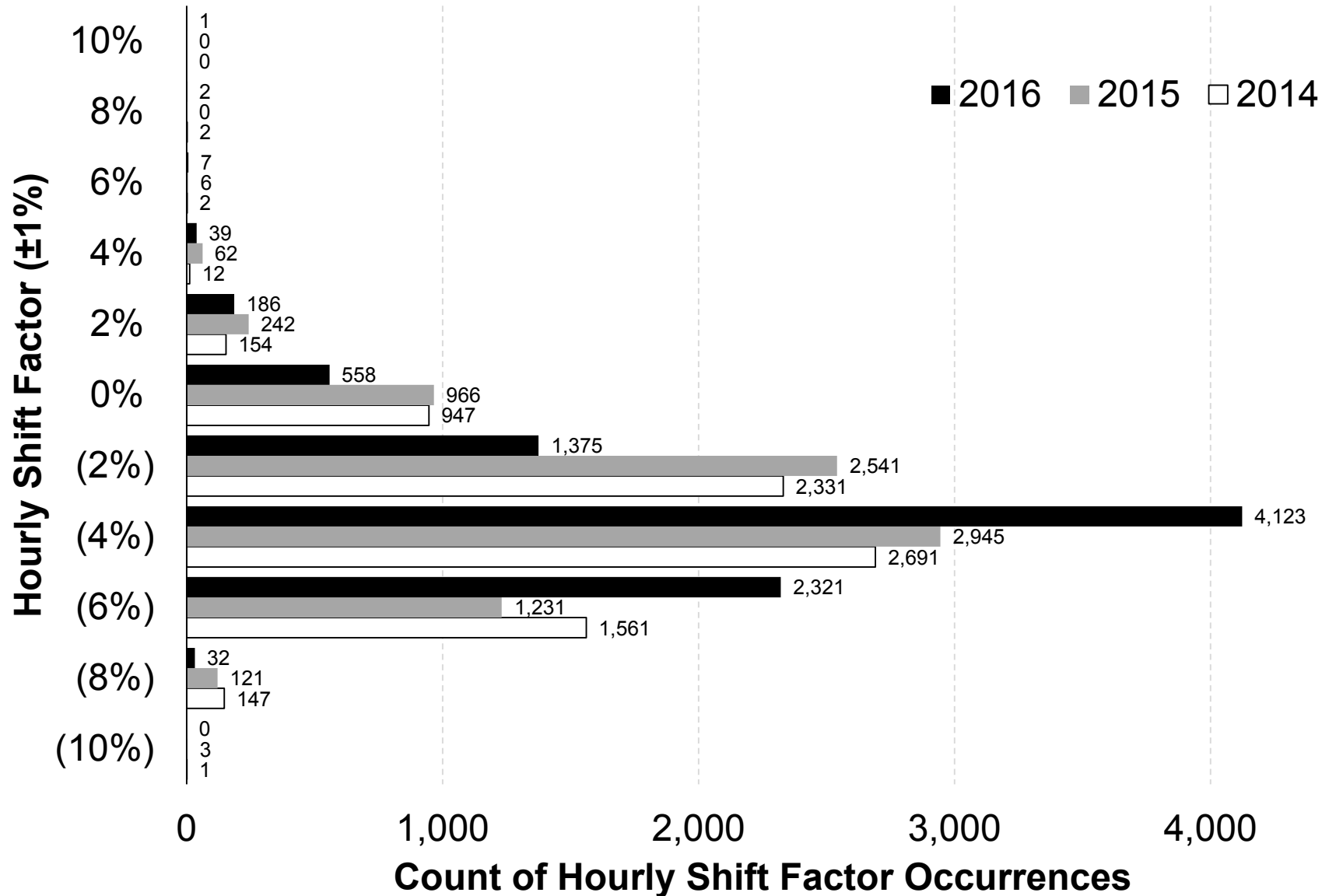


1%, 4%, and 6% of hours were unsolvable in 2016, 2015, and 2014

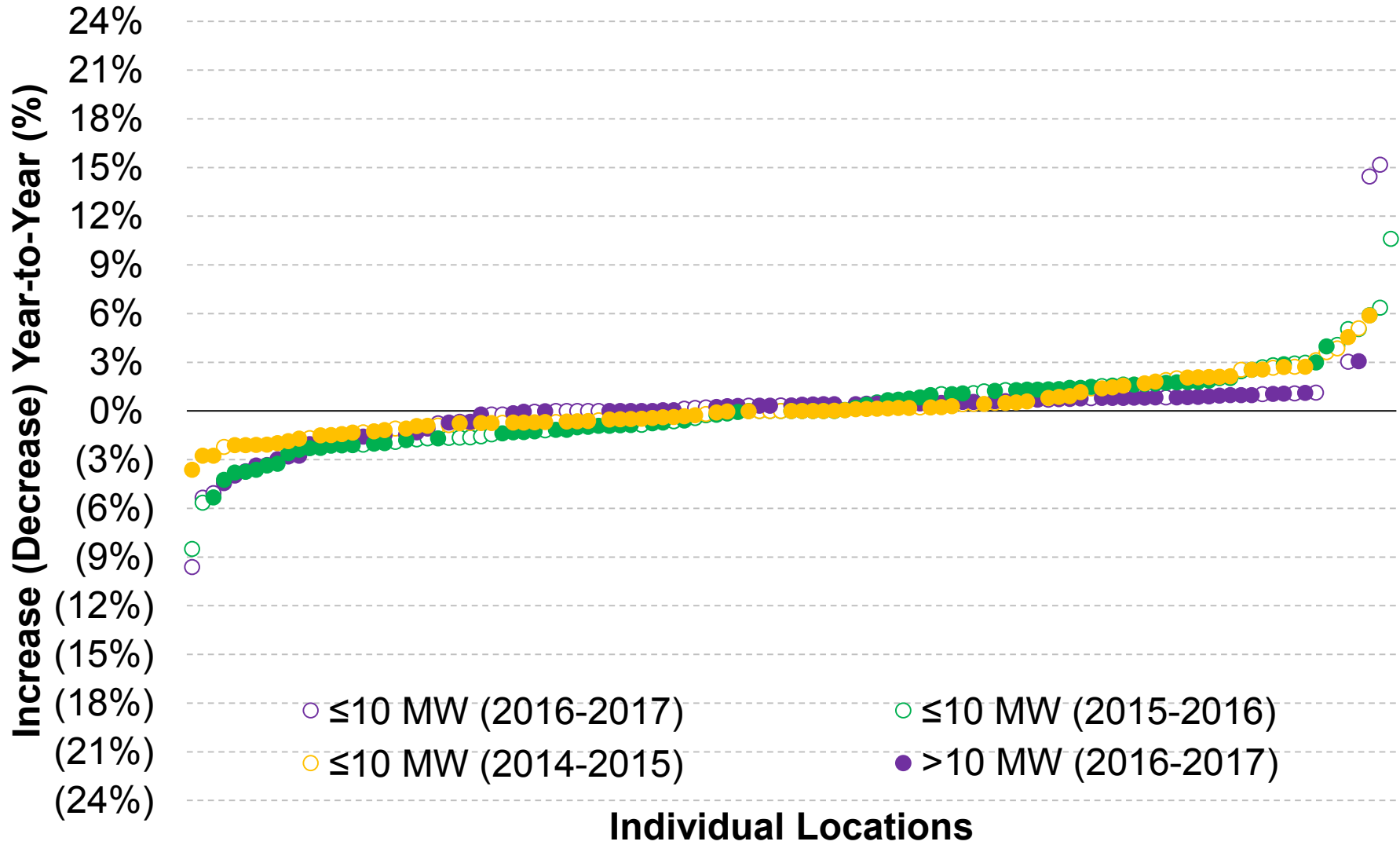


Note: 1%, 4%, and 6% unsolvable hours were calculated excluding “no dispatch” and “not yet in service” hours

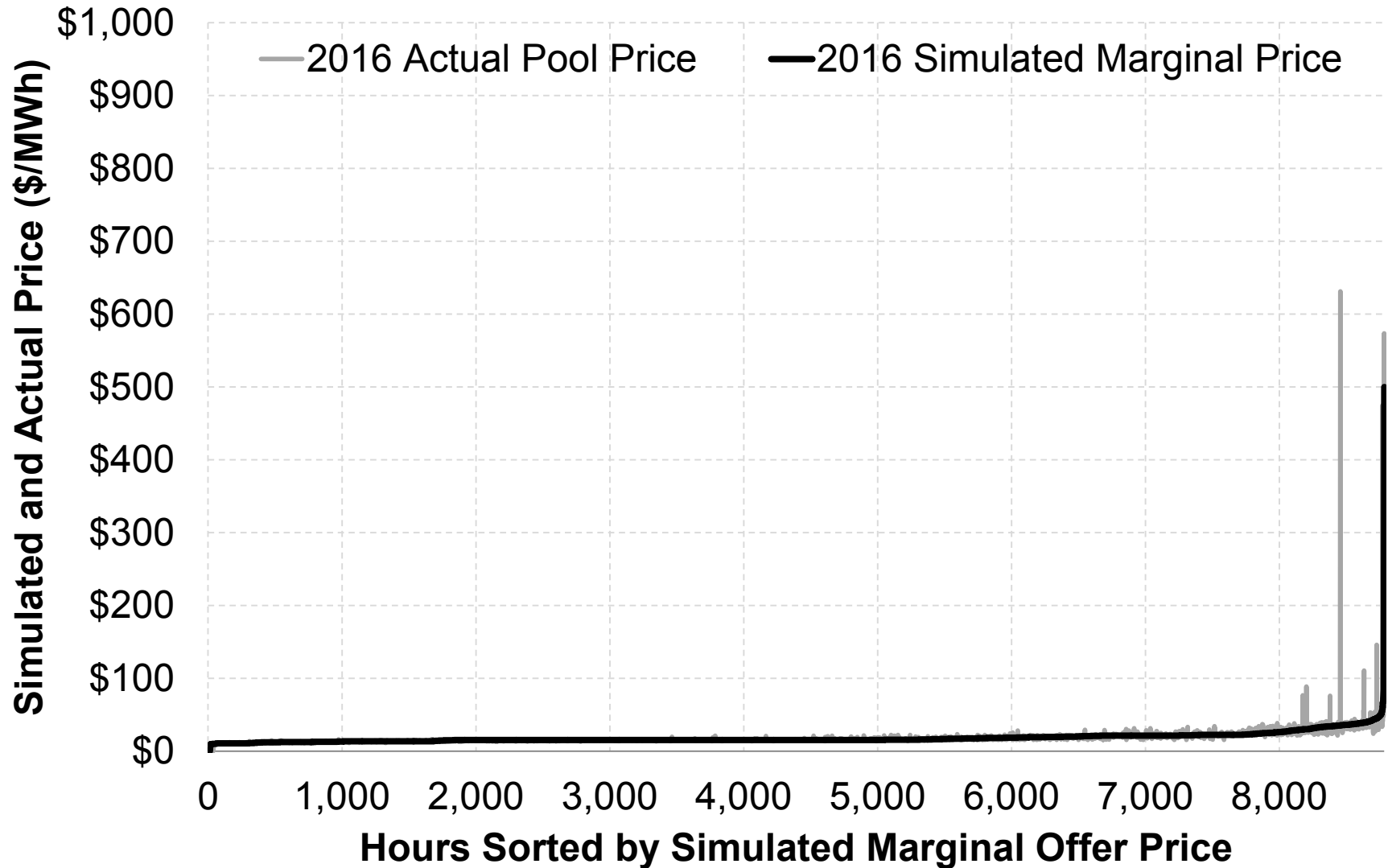
About 96% of hourly shift factors are between 1% and (7%) over all three years



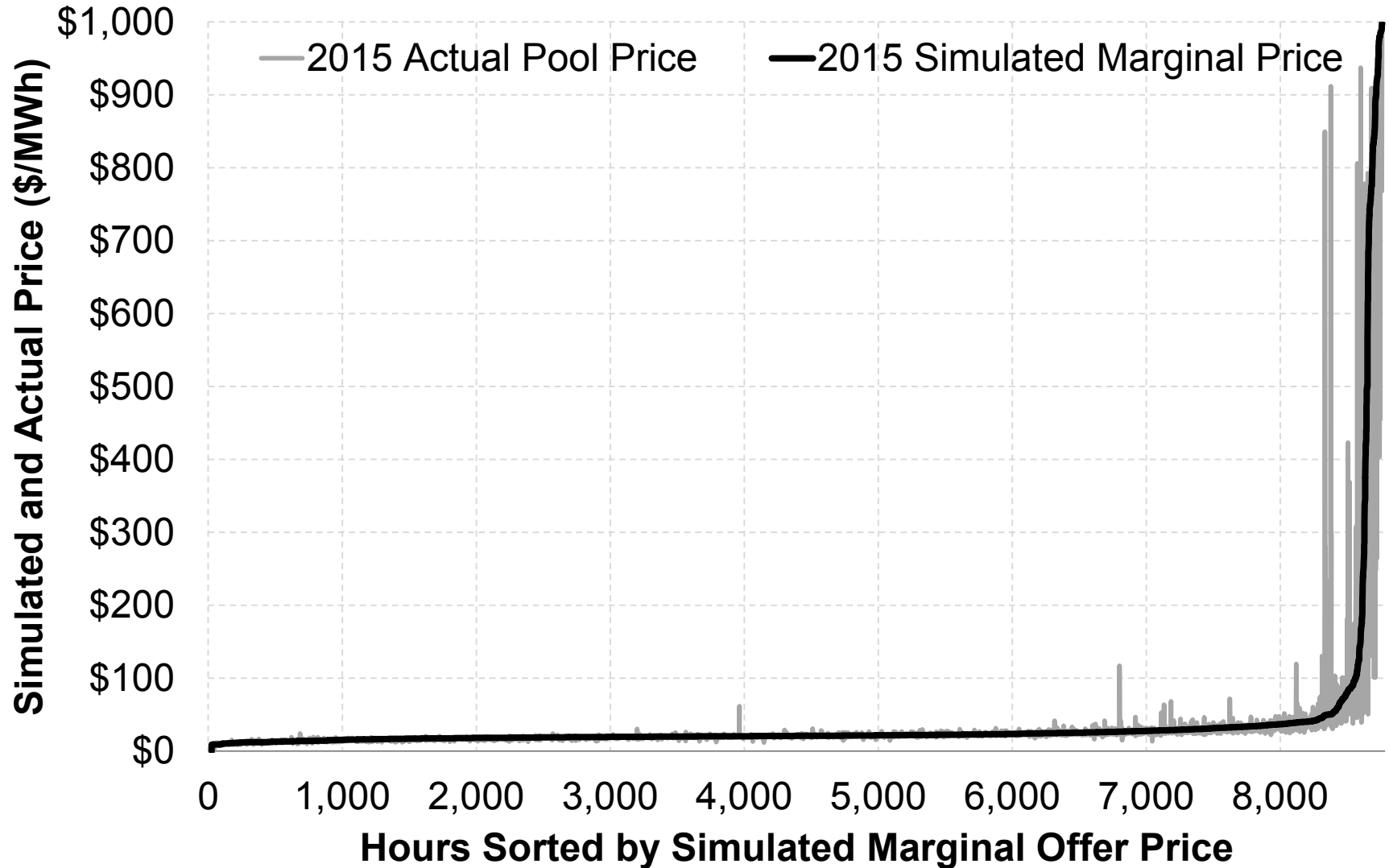
Almost all loss factor changes are within $\pm 3\%$ for all three years



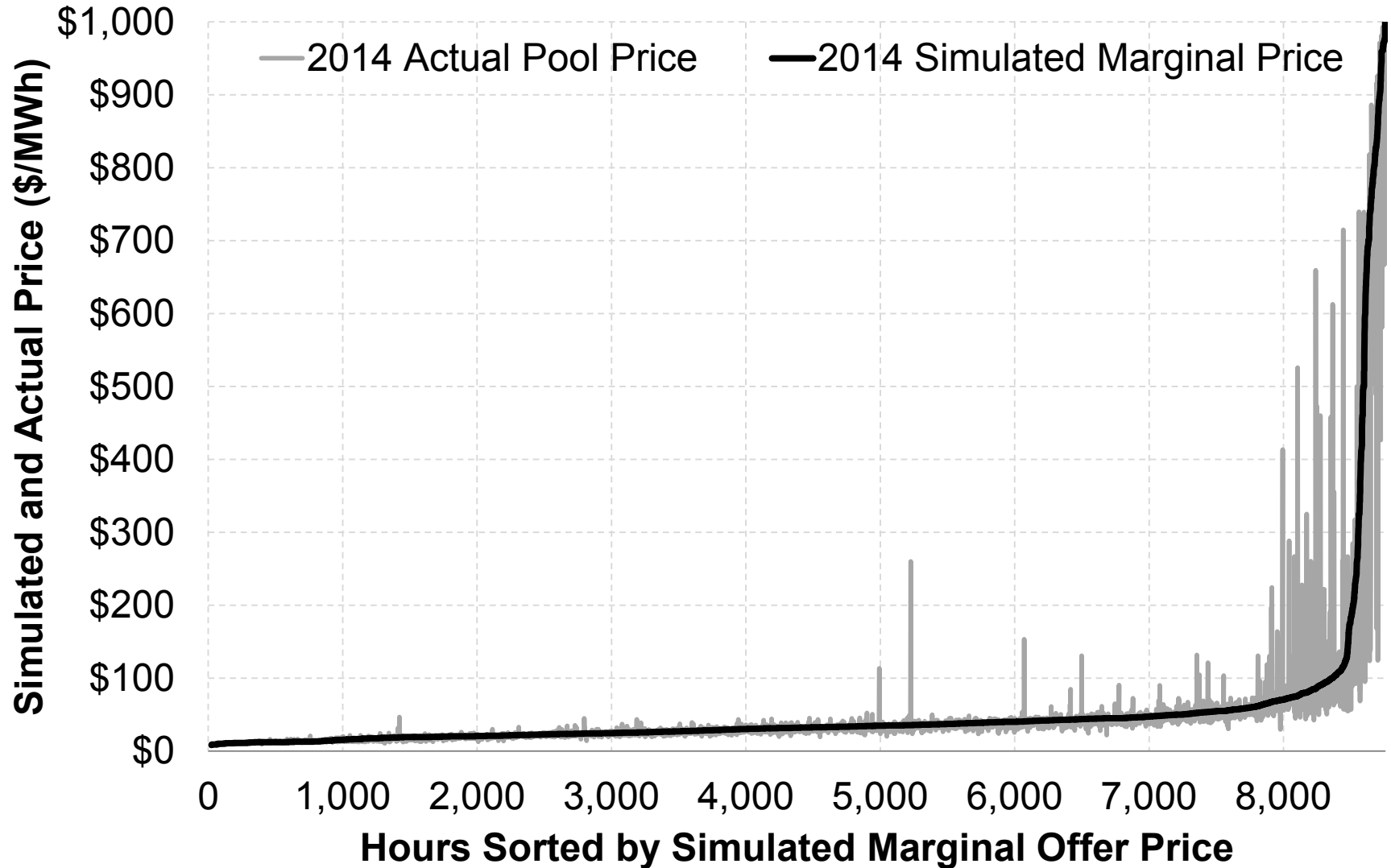
Simulated marginal offer price was similar to actual pool price in 2016



Simulated marginal offer price varied from actual pool price in 2% of 2015



Simulated marginal offer price varied from actual pool price in 3% of 2014



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

2016 Marginal Units			2015 Marginal Units			2014 Marginal Units		
Location	Hours	Area	Location	Hours	Area	Location	Hours	Area
Sheerness #1	870	Sheerness	Sheerness #2	956	Sheerness	Battle River #5	700	Alliance
Sheerness #2	848	Sheerness	Shepard	907	Calgary	Sheerness #2	671	Sheerness
Battle River #5	743	Alliance	Sheerness #1	793	Sheerness	Sheerness #1	669	Sheerness
Shepard	740	Calgary	Battle River #5	700	Alliance	Sundance #4	659	Lake Wabamun
Sundance #3	622	Lake Wabamun	Sundance #4	628	Lake Wabamun	Calgary Energy	581	Calgary
Sundance #4	619	Lake Wabamun	Joffre ISD	461	Red Deer	Joffre ISD	576	Red Deer
Sundance #6	494	Lake Wabamun	Sundance #2	428	Lake Wabamun	Battle River #4	511	Alliance
Sundance #2	415	Lake Wabamun	Sundance #3	413	Lake Wabamun	Sundance #3	501	Lake Wabamun
Sundance #1	378	Lake Wabamun	Battle River #4	403	Alliance	Dow Complex	483	Ft Saskatchewan
Sundance #5	350	Lake Wabamun	Sundance #1	402	Lake Wabamun	Battle River #3	428	Alliance
Keephills #2	255	Lake Wabamun	Calgary Energy	304	Calgary	Sundance #2	309	Lake Wabamun
Joffre ISD	212	Red Deer	Dow Complex	234	Ft Saskatchewan	Sundance #1	260	Lake Wabamun
Calgary Energy	210	Calgary	Nexen Balzac	200	Calgary	Nexen Balzac	249	Calgary
Dow Complex	196	Ft Saskatchewan	Sundance #5	141	Lake Wabamun	Medicine Hat	227	Medicine Hat
Keephills #1	180	Lake Wabamun	Rainbow #5	133	Rainbow Lake	Cavalier	197	Strathmore
Battle River #4	177	Alliance	Medicine Hat	124	Medicine Hat	H. R. Milner	180	Grande Cache
Genesee #2	144	Lake Wabamun	Scotford ISD	122	Ft Saskatchewan	Clover Bar #2	146	Edmonton
Scotford ISD	130	Ft Saskatchewan	Sundance #6	121	Lake Wabamun	Sundance #5	146	Lake Wabamun
Brazeau Hydro	130	Drayton Valley	Keephills #2	115	Lake Wabamun	Scotford ISD	138	Ft Saskatchewan
Genesee #1	117	Lake Wabamun	Cavalier	104	Strathmore	Keephills #2	133	Lake Wabamun

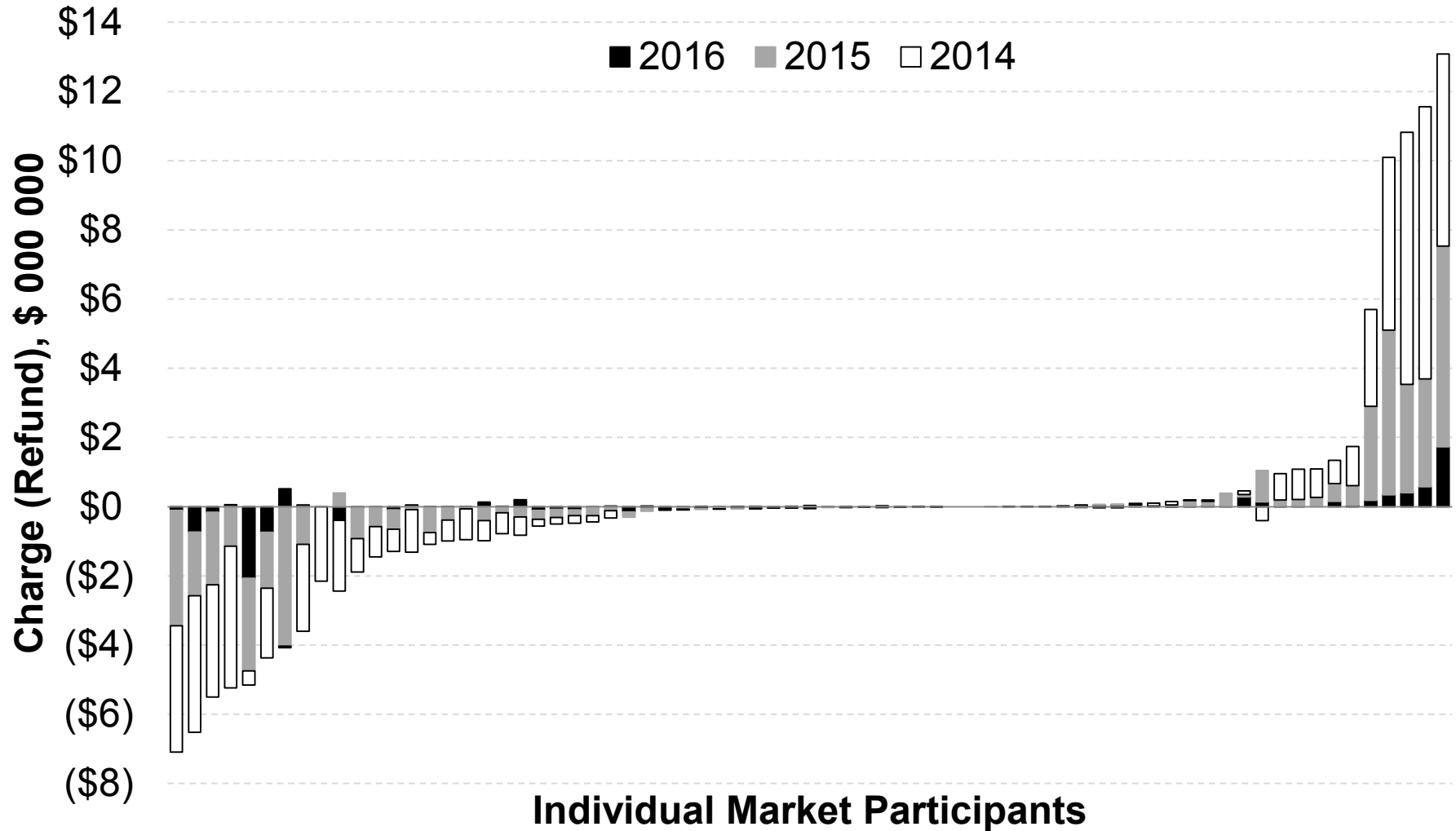
AESO published 2016, 2015, and 2014 Module C adjustments on July 7, 2020

- Loss charge and credit adjustments resulted from application of recalculated loss factors to bills issued from 2016 to 2014.
- Interest was applied in accordance with directions in Decision 790-D06-2017.
- Adjustments were calculated by location in one workbook for each year and summarized by market participant in a cumulative workbook.
- The AESO is completing final validation of the Module C adjustment workbooks.
- Workbooks will also be updated to reflect the earlier financial settlement dates directed in Decision 25150-D02-2020.

Adjustments workbook provides billing volumes and calculation of adjustments

- Metered energy, MWh
- Metered energy × pool price, \$
- Original loss factor, %
- Original losses charge or credit, \$
- Original Rider E charge or credit, \$
- Recalculated loss factor, %
- Recalculated losses charge or credit, \$
- Recalculated Rider E charge or credit, \$
- Losses adjustment charge or refund, \$
- Interest charge or refund, \$
- Module C adjustment charge or refund, \$

2016-2014 adjustments range from \$7 million refund to \$13 million charge



Note: Amounts include allocated interest

Compliance filing included process for settlement of Module C adjustments

- Post loss factors and related information.
- Post Module C adjustments.
- Opportunity to submit payment plan applications.
- Issue preliminary statements at least 30 days after posting loss factors.
 - 5th business day of month
- Issue final statements.
 - 15th business day of month
- Financial settlement at least 60 days after final statements.
 - 20th business day of month
- Invoicing would be delayed if additional time was required to address questions or concerns raised by stakeholders.

Validation report based on 2016 simulation is nearing completion

- Report describing implementation issues and their resolution has been delayed due to focus on data validation and process improvements
- Report will be posted before invoices are issued.

Remaining Module C work is progressing on schedule

- More robust data validation processes have been implemented.
- Additional resources have been assigned within AESO and at Teshmont.
- Loss factors for 2013 and 2012 have been recalculated and are being validated.
- Loss factors for 2011 and 2010 are in calculation workflow
- Data preparation and validation for 2009 has been completed.
- Data preparation and validation for 2008 and 2007 is underway.

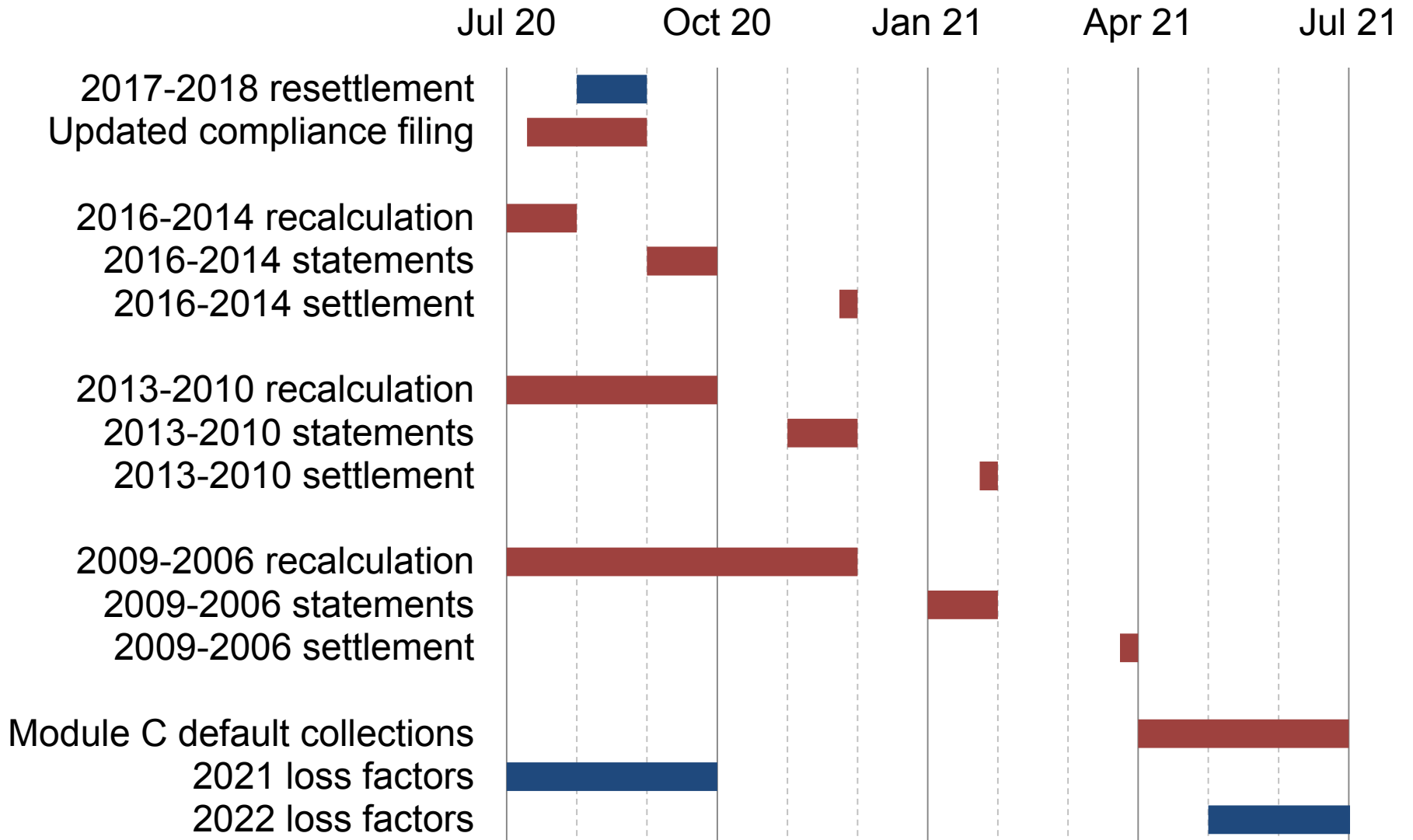
Decision 25150-D02-2020 established three periods for Module C settlement

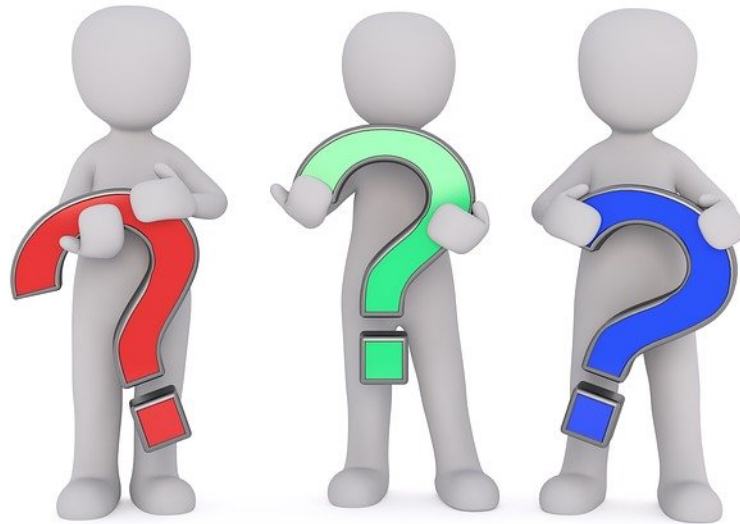
- Decision 790-D06-2017 was varied to divide settlement into three periods.
 - 2016 to 2014, 2013 to 2010, and 2009 to 2006
- Settlement of 2016 to 2014 should occur as soon as possible.
- AESO is directed to assign necessary resources to implement three-period approach.
 - Incremental cost to be recovered through energy market trading fee.
- AESO to submit updated payment plan compliance filing by August 17.
- AESO considers that preliminary invoices cannot be issued until compliance filing is approved.

2021 loss factor development has been initiated

- Historical merit order and load data from 2019 has been prepared.
- Changes and additions to historical data have been identified.
- Input data expected to be finalized and validated in August.
- Loss factors expected to be calculated in September.
 - Possibility that October 1 “best efforts” publishing deadline will not be achieved.

Module C settlements tentatively planned for Nov 2020, Jan 2021, and Mar 2021





- John Martin
Senior Special Projects Advisor
john.martin@aeso.ca
403-539-2465
- Milton Castro-Núñez
Senior Engineer, Transmission Program Support
milton.castro-nunez@aeso.ca
403-539-2537
- Loss factors, stakeholder consultation information, and related documents are posted on AESO website
 - Grid ► Loss factors ► 2020 loss factors
 - Grid ► Loss factors ► Stakeholder engagement
 - Grid ► Loss factors ► Loss factors recalculation for 2006-2016



- **Twitter:** @theAESO
- **Email:** milton.castro-nunez@aeso.ca
- **Website:** www.aeso.ca
- Subscribe to our stakeholder newsletter

Thank you