



# Proposed Firm Gas Adjustment May Overstate Accreditation of Remaining Non-Firm Resources

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April 9, 2024

# Concerns With the Core Gas Resource Accreditation Design Remain

Assuming incremental investment in gas supply capability for each increment of gas generating capability added is inconsistent with the calculation of Marginal Reliability Impact for other resources.

$$\frac{\Delta \text{EUE}}{\Delta \text{GC}_{\text{gas}} + \Delta \text{GS}} \neq \frac{\Delta \text{EUE}}{\Delta \text{GC}_{\text{rest}}}$$

EUE = Expected Unserved Energy

GC = Generating Capability

GS = Gas Supply

After a year of FirstLight and others expressing similar concerns (including the External Market Monitor's March presentation to the MC), it is unclear when or where the core deficiency in the proposed non-firm gas accreditation will be sufficiently engaged. Possibly through an approach that reflects the gas constraint in the capacity auction.

However, in the meantime, FirstLight now turns its focus to how well the firm gas election/Energy Capability (EC) adjustment under the ISO's winter gas accreditation design works. It may also be relevant to the anticipated approach that reflects the gas constraint in the capacity auction.

# ISO Proposed Adjustment for Firm Elections/Energy Capability

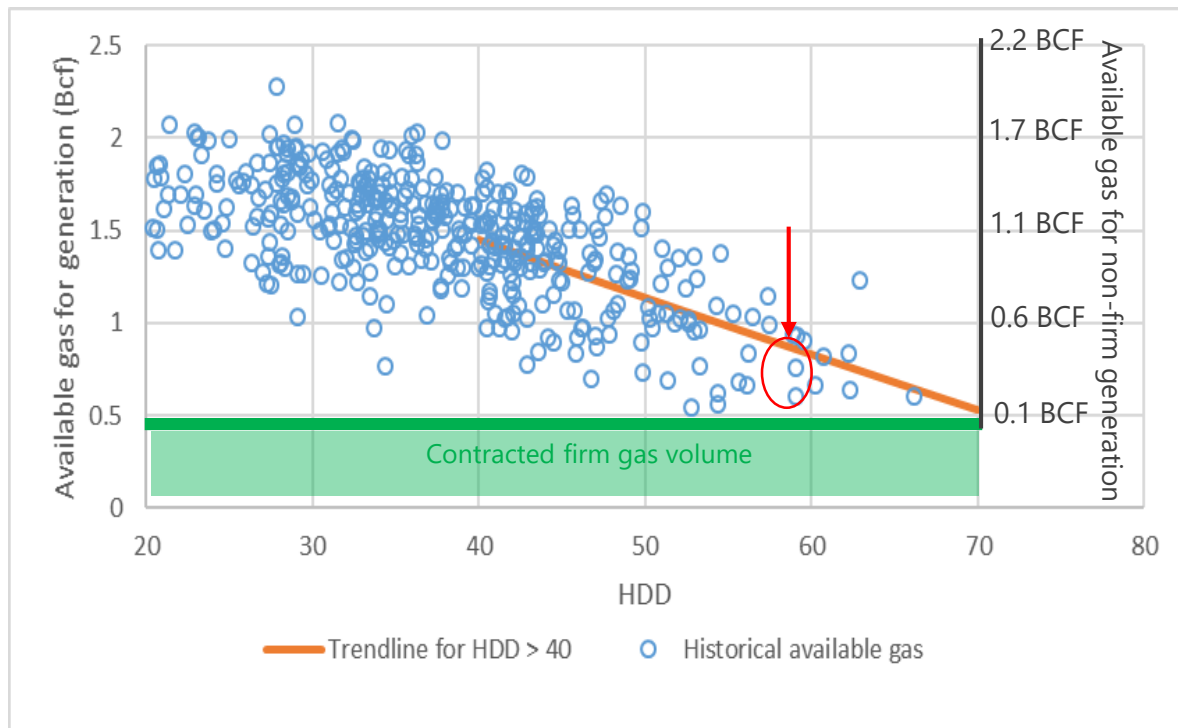
- ❑ As proposed, the aggregate non-firm gas winter Qualified Marginal Reliability Impact Capacity (QMRIC) would be reduced by each megawatt of firm gas QMRIC on a one-for-one basis.

$$Total\ QMRIC_{Winter}^{NonFirmGas} = \max(0, QMRIC_{Winter}^{TotalGas} - \sum_i QMRIC_{i,winter}^{FirmGas})^1$$

- ❑ While the change in nomenclature from firm elections to Energy Capability (EC) displays the interaction in terms of RAA MRI event-hours, it does not change this general one for one relationship.

<sup>1</sup> Slide 28 of November 7-8, 2023 ISO Presentation to the MC entitled Resource Capacity Accreditation in the Forward Capacity Market: Winter Gas and Oil Qualification, Modeling, and Accreditation" at <https://www.iso-ne.com/event-details?eventId=150038>

# Firm Elections Decrease the Level and Increase the Variability of Net Residual Gas Remaining for Non-Firm MWs



At the identified regression line point at ~0.8 BCF (~58 HDD), the two points below the curve are ~0.75 BCF (6.25% below regression line) and ~0.6 BCF (25% below regression line).

However, assuming 0.4 BCF of gas committed to firm elections, the same regression line location is now only 0.4 BCF at 58 HDD, with the two points below the curve at 0.35 BCF (12.5% below regression line) and 0.2 BCF (50% below regression line).

This impact does not seem to be accounted for in the MW-for-MW swap form of adjustment.

A closer look at the performance vs gas duration curve can provide better insight.

Original graph from slide 12 of ISO December 12, 2023 presentation to the NEPOOL MC entitled "Resource Capacity Accreditation in the Forward Capacity Market: Winter Gas and Oil Qualification, Modeling, and Accreditation". (Assumed firm gas volume, right-hand axis and labels and red arrow and oval added.)

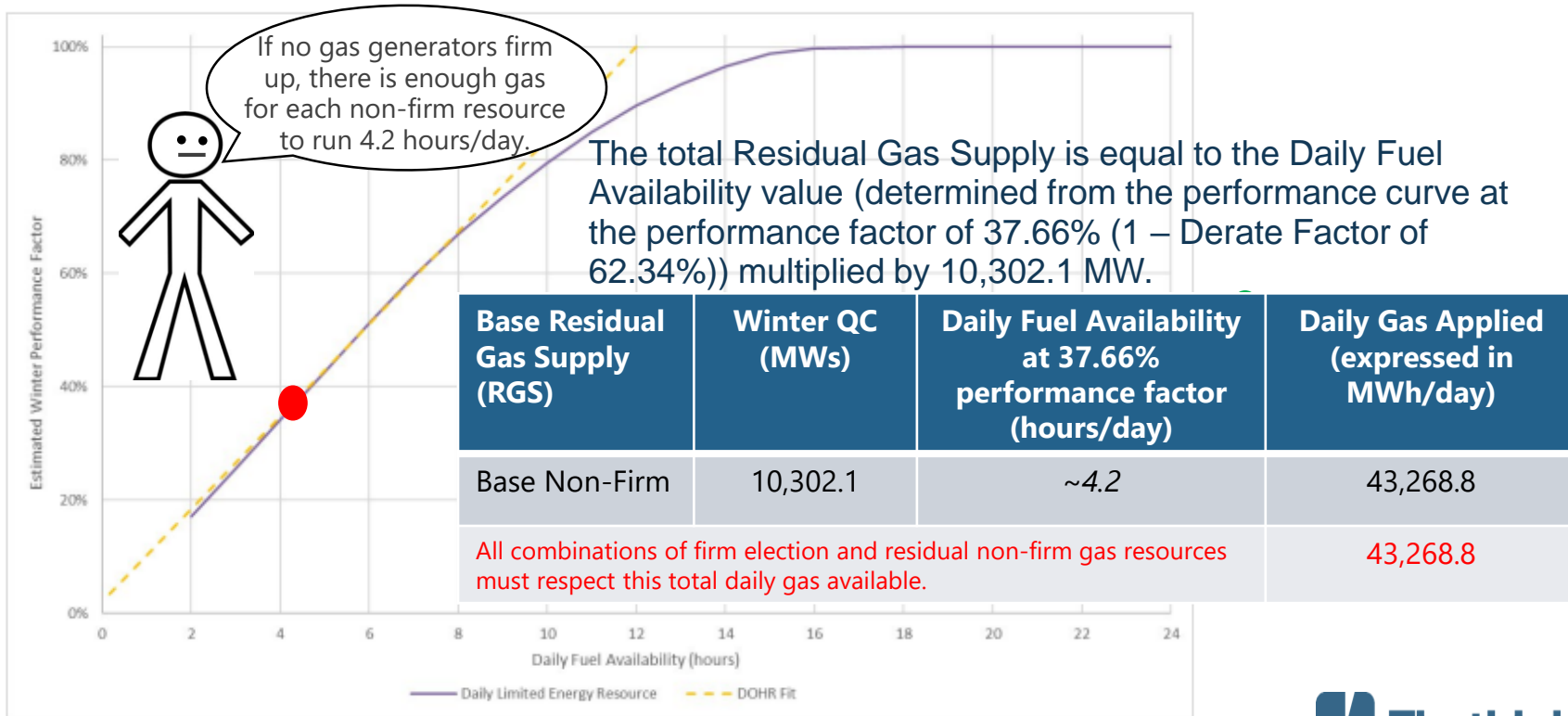
# Start with the Firm and Non-Firm MWs in ISO's February Impact Analysis

	Winter FCA 18 Qualified Capacity (MW)	Energy Capability Qualified Capacity (MW)	Remaining Winter Qualified Capacity (MW)	Winter Derating Factor (MW)	Winter FCA 18 QMRIC (MW)	Winter Firm Gas QC (MW)	Winter Non-Firm Gas QC (MW)	Total Gas QC (MW)
Dual Fuel (not op limited)	7,269.1	5,678.9	1,590.8	62.34%	6,278.0	0	1,590.8	1,590.8
Dual Fuel (operationally limited)	2,333.9	2,164.7	169.2	100%	2,164.7	0	169.2	169.2
Gas (not op limited)	7,873.3	929.5	6,943.8	62.34%	3,544.5	929.5	6,943.8	7,873.3
Gas (operationally limited)	668.8	0	668.8	100%	0	0	668.8	668.8
MWs considered for purposes of initially determining the 62.34% Derate Factor.								10,302.1

Values in columns identified by white font labels are taken from table on from slide 45 of the ISO-NE February 6, 2024 presentation entitled "Resource Capacity Accreditation in the Forward Capacity Market: FCA 18/19 Base Accreditation". V

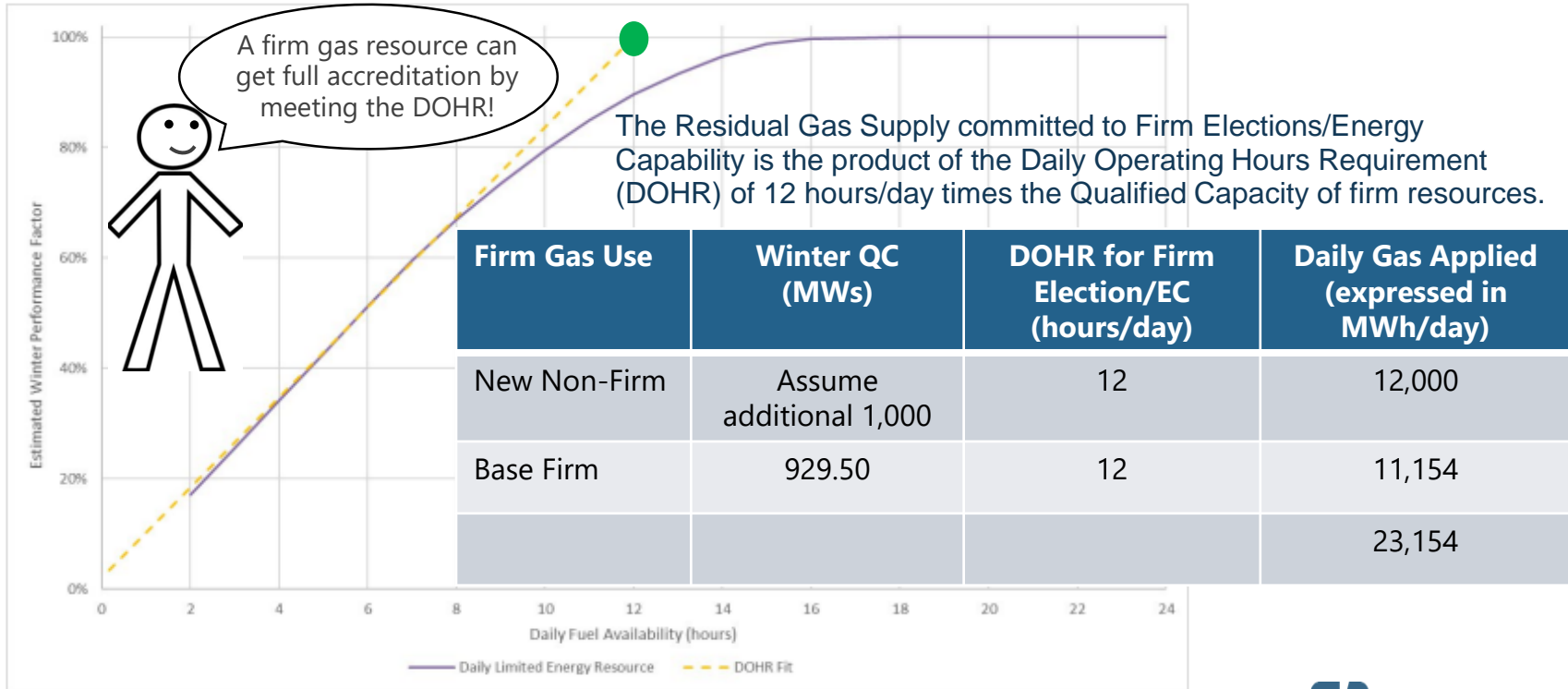
# Use that Information to Determine the Total Daily Residual Gas Supply

Performance Curve from slide 11 of the ISO-NE February 6, 2024 presentation entitled “Resource Capacity Accreditation in the Forward Capacity Market: FCA 18/19 Base Accreditation” (red circle added for emphasis)



# Then Determine the Quantity of Gas Used to Achieve Firm Status

Performance Curve from slide 11 of the ISO-NE February 6, 2024 presentation entitled “Resource Capacity Accreditation in the Forward Capacity Market: FCA 18/19 Base Accreditation” (*green circle added for emphasis*)



# The Gas Remaining for Non-Firm = Total RGS Minus Gas Used to Firm-Up

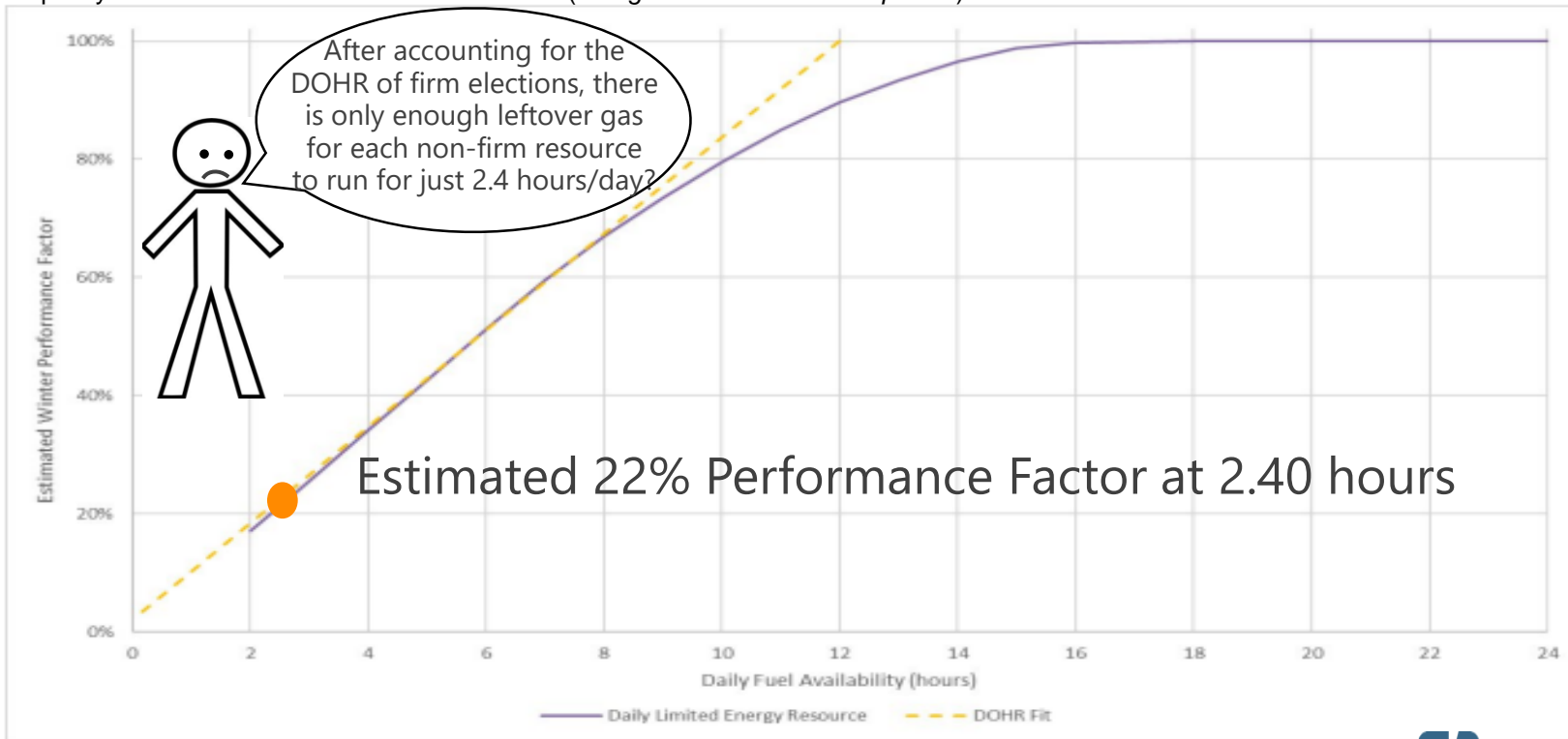
	Winter QC (MWs)  A	DOHR for Firm Election/EC, or Daily Gas Duration @ Performance Factor (PF) (hours/day)  B	Daily Gas Use (in MWh/day)  A * B (except underlined)
Base gas-only MWs	10,302.1 (i)	~4.2 @ 37.66% PF	<b>43,268</b>
		Total Residual Gas Supply (slide 6)	<b><u>43,268</u></b>
<b>Daily Gas contracted by Firm Elections/Energy Capability (Slide 7)</b>			
Additional 'New' Firm	Assume 1,000	12	<b>12,000</b>
Base Firm	929.5	12	<b>11,154</b>
	1,929.5 (ii)	RGS applied to Firm Elections	<b><u>23,154</u></b>
<b>Gas for remaining non-firm (Base RGS minus Gas contracted by Firm Elections)</b>			
Remaining non-firm	<b>8,372.6 ((i) – (ii))</b>	<b>2.40 (20,114/8372.6)</b>	<b><u>20,114</u></b>
<b>Resulting Performance Factor = 22% estimated from performance curve – next slide</b>			

Note: Orange Font reflects a calculated value. Red font reflects value derived from performance curve. Rest of values reflect values obtained in ISO presentation at the February 6-7, 2024 MC meeting entitled "Resource Capacity Accreditation: FCA 18/19 Base Case Accreditation".

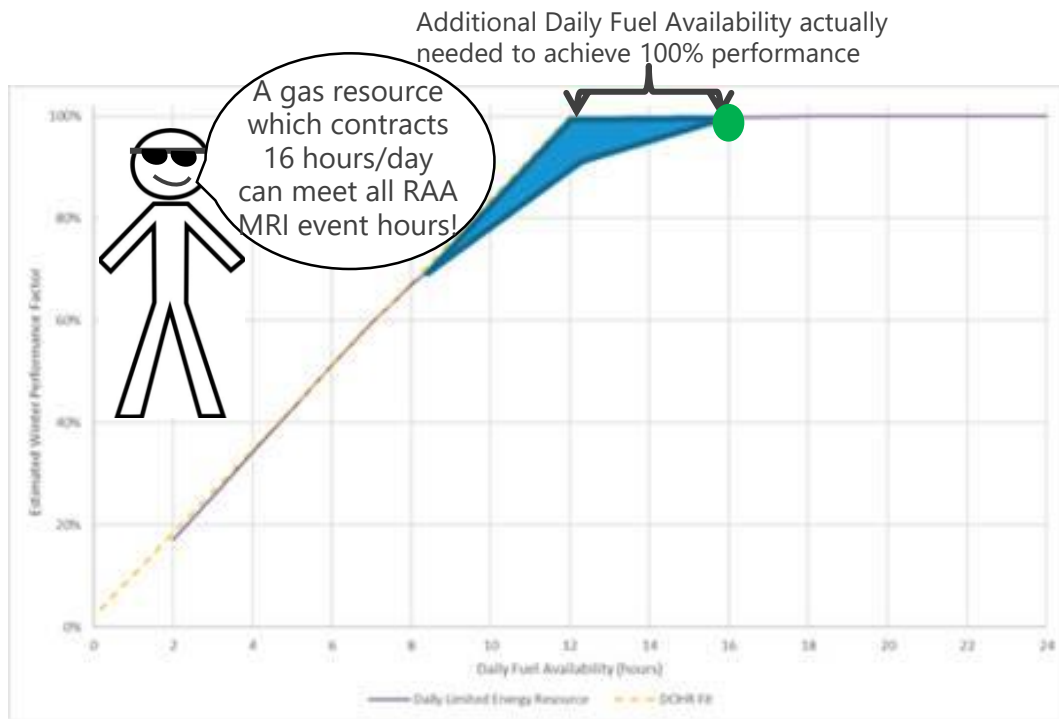


# ISO Gas Performance Curve vs. Daily Gas Duration (expressed in MWh)

Performance Curve from slide 11 of the ISO-NE February 6, 2024 presentation entitled “Resource Capacity Accreditation in the Forward Capacity Market: FCA 18/19 Base Accreditation” (*orange circle added for emphasis*)



# Yet, More Gas is Really Needed to Achieve 100% Performance



Performance Curve from slide 11 of the ISO-NE February 6, 2024 presentation entitled "Resource Capacity Accreditation in the Forward Capacity Market: FCA 18/19 Base Accreditation" (*blue area added for emphasis*)

**While the straight-line DOHR method gives 100% performance credit at 12-hours, the actual gas supply needed to achieve 100% performance is close to a 16-hour duration.**

**After removing the 16-hours/day of gas needed to achieve the 100% performance assigned to firm elections, the net remaining RGS now only supports a 1.48 hour/day duration for the remaining non-firm resources.**

**This yields a lower performance factor of 15% and a higher 85% Derate Factor.**

# Accounting for the Firm Gas Needed to Achieve 100% Performance Reduces the Performance Factor for Non-Firm MWs

	Winter QC (MWs) A	DOHR for Firm Election/EC, or Daily Gas Duration @ Performance Factor (PF) (hours/day) B	Daily Gas Use (in MWh/day) A * B (except underlined)
Base gas-only MWs	10,302.1 (i)	~4.2 @ 37.66% PF	43,268
		Total Residual Gas Supply	<u>43,268</u>
<b>Daily Gas contracted by Firm Elections/Energy Capability (Slide 11)</b>			
Additional 'New' Firm	Assume 1,000	16	16,000
Base Firm	929.5	16	14,872
	1,929.5 (ii)	RGS needed for Firm Elections to provide 100% performance	<u>30,872</u>
<b>Gas for remaining non-firm (Base RGS minus Gas contracted by Firm Elections)</b>			
Remaining non-firm	8,372.6 ((i) – (ii))	1.48 (12,396/8372.6)	<u>12,396</u>
<b>Resulting Performance Factor = 15% performance factor estimated from curve</b>			

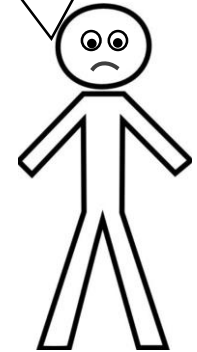
Note: Orange Font reflects a calculated value. Red font reflects value derived from performance curve. Blue value is gas duration needed to meet 100% performance. Rest of values either reflect values calculated in prior slide or values obtained in ISO presentation at the February 6-7, 2024 MC meeting entitled "Resource Capacity Accreditation: FCA 18/19 Base Case Accreditation".

# Honoring the Gas Constraint Yields a Lower Non-Firm QMRIC

## Result of ISO Adjustment for Firm Elections/Energy Capability

	Winter QC (MW)	Performance Factor	Winter QMRIC <sup>1</sup> (MW)
Starting Non-Firm	10,302.1	37.66%	3,879.8 (i)
Firm Elections	1,929.5	100%	1,929.5 (ii)
Remaining Non-Firm			1,950.3 (i)-(ii)

After accounting for the gas needed to achieve the 100% performance granted for just meeting the DOHR, there is really only enough leftover gas for non-firm resources to run for 1.48 hours/day ?



## Adjustment for Firm Elections/(EC) Respecting Gas Constraint

	Winter QC (MW)	Performance Factor	Winter QMRIC <sup>1</sup> (MW)
Starting Non-Firm	10,302.1	37.66%	
Firm Elections	1,929.5	100%	
Remaining Non-Firm	8,372.6	15%	<b>1,255.9</b>

Fully adjusted value is >35% lower

1 – The Winter QMRIC value here assumes all RAA MRI event hours occur in the Winter. While the absolute level of Winter QMRIC would be lower if the ratio of Winter MRI RAA event hours to Annual MRI RAA event hours was considered, the percentage difference would remain the same.

## Correction Needed

- ❑ The ISO proposed adjustment to reflect the impact of firm gas elections on remaining non-firm gas resource accreditation does not appear to honor the total Residual Gas Supply (RGS) constraint.
- ❑ Honoring the RGS constraint requires that the sum of the residual gas supply for remaining non-firm MWs plus the gas needed to support the 100% performance attributed to firm elections/Energy Capability does not exceed the total RGS.
- ❑ Similar consideration appears to be necessary in a solution that reflects the gas constraint as a market constraint in the Forward Capacity Auction.



**FirstLight**