

# Capacity Cost Allocation Analysis Work Group Meeting #2

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#### Agenda



- Review and discussion of analysis circulated by the AESO
  - Capacity Cost Rate Estimator Tool
  - Day-HE-Month Distribution of Expected Unserved Energy in the 2022-23 Capacity Obligation Year
  - Note: All analysis is in draft form; no decisions have been made or have been endorsed by the AESO
- Recommendations for the Tariff Design Advisory Group (TDAG) meeting on November 8
- Next steps



#### **Capacity Cost Rate Estimator Tool**

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#### Capacity cost rate estimator: Preliminary version



- The spreadsheet tool estimates the capacity cost rates that would apply to energy consumption based on:
  - A variety of user-provided assumptions
  - Embedded assumptions about cost allocation process
- Important disclaimers about the tool:
  - The tool is in a preliminary form and the AESO cautions against drawing conclusions based on its results.
  - The tool has not been audited for correctness.
  - The AESO does not:
    - Endorse any of the assumptions upon which the tool operates
    - Certify that these assumptions are consistent with policy decisions
    - Endorse the preliminary results that may be derived from the tool

## Assumptions built into the tool (not exhaustive)



- All weekdays that are not holidays in a calendar month are treated the same; all weekends and holidays in a calendar month are treated the same
  - i.e., all weekday, non-holiday HE 15 in July are assigned to the same time period (bin) and have the same weight
- Consumption data are 2016 hourly DTS quantity (8784 hours)
- No feedback of capacity costs on the level of hourly consumption

#### User inputs: Specification of the time periods



- The user must allocate the weekday/weekend-HE-month to a time period (bin)
  - Tool allows for up to 8 time periods to be specified
  - Insert numbers 1 through 8 into the yellow matrices (next slide)
  - Time period numbers themselves are arbitrary
- Based on these inputs the tool will:
  - Add up the number of hours of the obligation year that fall into each time period (8784 hours in total since the underlying data are from 2016)
  - Calculate the average demand in each time period
- To be clear, the tool does not determine how the time periods are to be specified

### Allocation of day-HE-month periods to (capacity) time periods



	WEEKDAY (Time Bin)																WEE	KENI	)/HC	DLID	AY (T	ime	Bin)			
뽀	January	February	March	April	May	June	July	August	September	October	November	December		믶	January	February	March	April	Мау	June	July	August	September	October	November	December
1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1		2	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1		3	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1		4	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1		5	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1		6	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1		7	1	1	1	1	1	1	1	1	1	1	1	1
8	2	2	2	2	2	2	2	2	2	2	2	2		8	1	1	1	1	1	1	1	1	1	1	1	1
9	2	2	2	2	2	2	2	2	2	2	2	2		9	1	1	1	1	1	1	1	1	1	1	1	1
10	2	2	2	2	2	2	2	2	2	2	2	2		10	1	1	1	1	1	1	1	1	1	1	1	1
11	2	2	2	2	2	2	2	2	2	2	2	2		11	1	1	1	1	1	1	1	1	1	1	1	1
12	3	3	3	3	3	3	3	3	3	3	3	3		12	1	1	1	1	1	1	1	1	1	1	1	1
13	3	3	3	3	3	3	3	3	3	3	3	3		13	1	1	1	1	1	1	1	1	1	1	1	1
14	3	3	3	3	4	4	4	4	3	3	3	3		14	1	1	1	1	2	2	2	2	1	1	1	1
15	3	3	3	3	4	4	4	4	3	3	3	3		15	1	1	1	1	2	2	2	2	1	1	1	1
16	3	3	3	3	4	4	4	4	3	3	3	3		16	1	1	1	1	2	2	2	2	1	1	1	1
17	4	4	3	3	4	4	4	4	3	3	3	4		17	2	2	1	1	2	2	2	2	1	1	1	2
18	4	4	3	3	3	3	3	3	3	3	3	4		18	2	2	1	1	1	1	1	1	1	1	1	2
19	4	4	3	3	3	3	3	3	3	3	3	4		19	2	2	1	1	1	1	1	1	1	1	1	2
20	4	4	3	3	3	3	3	3	3	3	3	4		20	2	2	1	1	1	1	1	1	1	1	1	2
21	2	2	2	2	2	2	2	2	2	2	2	2		21	1	1	1	1	1	1	1	1	1	1	1	1
22	2	2	2	2	2	2	2	2	2	2	2	2		22	1	1	1	1	1	1	1	1	1	1	1	1
23	1	1	1	1	1	1	1	1	1	1	1	1		23	1	1	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1	1	1		24	1	1	1	1	1	1	1	1	1	1	1	1
							en	ter v	alue	s bet	wee	n 1 a	and 8	ANE	ass)	ocia	ited I	oin w	eigh/	its						

## User inputs: Time period (bin) weights and the capacity revenue requirement



- For each time period (bin) to which a positive number of hours are allocated, the user must specify the time period (bin) weight
  - The restrictions set out in policy are not hard-coded as constraints in the tool
  - The user must check whether the relevant constraints are satisfied
  - Insert into the yellow column (next slide)
- The user must specify the capacity revenue requirement in dollars, i.e., the amount of money that must be raised by the WEM to fund capacity payments in the obligation period

#### Assumptions and estimated rates



Time Bin (from tables)	# Weekday Hours	# Weekend Hours	Total Hours in Bin	Bin Weight	Average Demand	Total Demand in Bin (TWh)	Weighted Demand	Capacity Price (\$/MWh)	Revenue from Bin (check)
1	2277	2448	4725	0	6,391	30.20	0.00	0.00	0.00
2	1518	264	1782	1	7,155	12.75	12.75	18.15	231.39
3	1685	0	1685	2	7,270	12.25	24.50	36.29	444.58
4	592	0	592	4	7,540	4.46	17.86	72.59	324.03
5	0	0	0	99999	n/a	n/a	n/a	n/a	n/a
6	0	0	0	99999	n/a	n/a	n/a	n/a	n/a
7	0	0	0	99999	n/a	n/a	n/a	n/a	n/a
8	0	0	0	99999	n/a	n/a	n/a	n/a	n/a
				enter any	positive va	lue			
Total	6072	2712	8784			59.66	55.11		1000.00
			Cap	acity Rever	nue Requir	ement (\$)	1,000,00	00.000.00	
			Unweight	ed Capacit	y Payment	(\$/MWh)		18.15	

#### Feedback



- WG discussion and feedback
- Usefulness and enhancements?
  - Source of user-provided inputs
    - Time periods
    - Time period weights
    - Capacity revenue requirement
  - Limitations of 2016 DTS data
    - Based on incentives and effects that were relevant in 2016
  - Feedback effect of capacity costs on consumption requires additional analysis



# Day-HE-Month Distribution of Expected Unserved Energy in the 2022-23 Capacity Obligation Year

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#### Description of data and analysis



- The table on the next slide show that fraction of Expected Unserved Energy (EUE) for the capacity obligation year 2022-23 broken down by:
  - Weekday / weekend
  - Hour-ending (HE)
  - Month
- Underlying capacity is minimum procurement volume necessary to satisfy the resource adequacy requirement
- Important caveat:
  - The minimum procurement volume and the methodology and assumptions underpinning it have not been approved by the Alberta Utilities Commission
  - Therefore, the results in the spreadsheets are subject to change

#### Visualization of Day-HE-Month distribution of EUE



		Weekday & Peak Day										Weekend Days															
Hour	Anuary	February	March	April	May	June	July	August	September	October	November	December	Total	Hour	January	February	March	April	May	June	ylut	August	September	October	November	December	Total
HE 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	HE 1	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
HE 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	HE 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HE 3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	HE 3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HE 4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.02%	HE 4	0.00%	0.01%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%
HE 5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.02%	HE 5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
HE 6	0.01%	0.00%	0.03%	0.01%	0.02%	0.00%	0.00%	0.00%	0.00%	0.08%	0.01%	0.01%	0.17%	HE 6	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.03%
HE 7	0.00%	0.01%	0.01%	0.02%	0.07%	0.00%	0.00%	0.00%	0.01%	0.23%	0.08%	0.00%	0.43%	HE 7	0.02%	0.00%	0.01%	0.02%	0.04%	0.00%	0.00%	0.00%	0.01%	0.11%	0.02%	0.00%	0.23%
HE 8	0.15%	0.13%	0.04%	0.10%	0.32%	0.00%	0.01%	0.00%	0.01%	0.28%	0.11%	0.06%	1.21%	HE 8	0.08%	0.07%	0.02%	0.07%	0.16%	0.01%	0.00%	0.00%	0.00%	0.23%	0.02%	0.07%	0.73%
HE 9	0.25%	0.16%	0.07%	0.19%	0.48%	0.03%	0.05%	0.02%	0.02%	0.68%	0.17%	0.21%	2.33%	HE 9	0.18%	0.09%	0.03%	0.09%	0.36%	0.03%	0.01%	0.01%	0.04%	0.24%	0.02%	0.11%	1.21%
HE 10	0.23%	0.15%	0.08%	0.29%	0.69%	0.07%	0.20%	0.17%	0.11%	0.79%	0.16%	0.11%	3.05%	HE 10	0.14%	0.12%	0.07%	0.11%	0.49%	0.04%	0.13%	0.03%	0.04%	0.32%	0.04%	0.11%	1.64%
HE 11	0.22%	0.16%	0.07%	0.38%	0.84%	0.16%	0.55%	0.24%	0.25%	0.87%	0.20%	0.22%	4.16%	HE 11	0.13%	0.14%	0.09%	0.13%	0.51%	0.05%	0.30%	0.13%	0.14%	0.32%	0.06%	0.09%	2.09%
HE 12	0.19%	0.21%	0.11%	0.43%	0.92%	0.21%	0.88%	0.40%	0.34%	0.81%	0.13%	0.19%	4.82%	HE 12	0.15%	0.10%	0.03%	0.09%	0.58%	0.03%	0.39%	0.14%	0.20%	0.29%	0.06%	0.10%	2.16%
HE 13	0.13%	0.17%	0.06%	0.36%	1.15%	0.25%	1.16%	0.66%	0.38%	0.84%	0.13%	0.18%	5.47%	HE 13	0.13%	0.18%	0.04%	0.10%	0.68%	0.14%	0.43%	0.15%	0.24%	0.31%	0.03%	0.05%	2.48%
HE 14					1.03%			0.73%						HE 14					0.62%								
HE 15	0.04%	0.18%	0.04%		0.95%									HE 15					0.59%								2.69%
HE 16			0.11%							1.00%				HE 16													3.04%
HE 17					1.04%									HE 17					0.58%								
HE 18					0.72%									HE 18					0.24%							0.56%	2.45%
HE 19			0.21%							1.31%		1.11%		HE 19					0.19%							0.32%	
HE 20					0.34%									HE 20					0.18%								
HE 21					0.38%									HE 21					0.15%								
HE 22					0.15%									HE 22					0.02%								0.44%
HE 23					0.08%									HE 23					0.02%								
HE 24					0.00%									HE 24	0.01%				0.01%								
Total	4.9%	4.8%	1.4%	3.5%	10.8%	2.4%	10.2%	6.6%	3.9%	11.7%	4.2%	6.2%	70.5%	Total	2.8%	2.2%	0.6%	1.0%	6.1%	0.6%	3.7%	1.9%	2.4%	4.5%	1.2%	2.5%	29.4%

#### Feedback



- WG discussion and feedback
- Use of data to specify WEM parameters:
  - Time periods
  - Time period weights
- Recommended extensions and additional analysis
  - Level of capacity?
- Consistency of input and potential integration with the Capacity Cost Rate Estimator Tool



## Thank you

