Public Service Company of Colorado
Electric Department
Renewable Connect
Derivation of Avoided Capacity Credit - locked in for the term of the PPA

Derivation of Avoided Capacity Credit:

1. The capital and fixed O&M cost of a Combustion Turbine CT (1st) generic resource:

Based on Winter Capacity Ratings - 214MW		
Year		CT #1 ($/kW-mo)
2018		$ 5.70

Data Source: Company's 2011 ERP Table 2.8-3(a)

2. Adjust the $/kW-Mo. cost calculated in step 1 for the summer capacity rating:
(214/173)*5.25 = 6.49

Based on Summer Capacity Ratings - 173MW		
Year		CT #1 ($/kW-mo)
2018		$ 7.05

3. Escalate the 2018 $/kW-Mo. cost derived in step 2 to calculate the 2018 - 2027 $/kW-Mo. cost per year.

Year	Summer 1st CT ($/kW-mo)
2018	$ 7.05
2019	$ 7.25
2020	$ 7.45
2021	$ 7.66
2022	$ 7.87
2023	$ 8.09
2024	$ 8.32
2025	$ 8.55
2026	$ 8.79
2027	$ 9.04

Date Source: A 2.8% escalation factor is applied per year, escalation factor is the Company's construction escalation factor.
The Company assumes a 10-year term to quantify capacity credit as a mid-point.

4. Derive the adjustment amount, this takes into consideration the operational characteristics of a QF versus a CT.
A QF does not provide the operational benefits of a CT, therefore, an adjustment is made to reflect these characteristics.

Adjustment:	$/kW-Mo.
Sch.2 - Reactive Supply and Voltage Control	0.2320
Sch.3 - Regulation and Frequency Response	0.0981
Sch.5 - Operating Reserve-Spinning	0.3114
Sch.6 - Operating Reserve-Supplemental	0.0808
Total	$ 0.7223

Data Source: PSCo OATT, rates effective 6-16-16.

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5. Apply the adjustment amount derived in step 4 to the 2018 - 2027 $/kW-Mo. cost per year from step 3, to derive the Adjusted Summer 1st CT cost ($/kW-Mo).

Year	Summer 1st CT ($/kW-Mo.)	Adjustment $/kW-Mo.	Adjusted Summer 1st CT ($/kW-Mo.)
2018	$ 7.05	$ 0.7223	$ 6.33
2019	$ 7.25	0.7223	$ 6.53
2020	$ 7.45	0.7223	$ 6.73
2021	$ 7.66	0.7223	$ 6.94
2022	$ 7.87	0.7223	$ 7.15
2023	$ 8.09	0.7223	$ 7.37
2024	$ 8.32	0.7223	$ 7.60
2025	$ 8.55	0.7223	$ 7.83
2026	$ 8.79	0.7223	$ 8.07
2027	$ 9.04	0.7223	$ 8.32

6. Calculate the annual Adjusted Summer 1st CT cost on $/kW-Yr. basis for 2018 - 2027.

Year	Adjusted Summer 1st CT ($/kW-Mo.)	Number of Months/ Year	Adjusted Summer 1st CT ($/kW-Yr.)
2018	$ 6.33	12	$ 75.94
2019	$ 6.53	12	$ 78.31
2020	$ 6.73	12	$ 80.75
2021	$ 6.94	12	$ 83.25
2022	$ 7.15	12	$ 85.82
2023	$ 7.37	12	$ 88.47
2024	$ 7.60	12	$ 91.19
2025	$ 7.83	12	$ 93.99
2026	$ 8.07	12	$ 96.86
2027	$ 8.32	12	$ 99.81

7. Calculate the Surplus Capacity Credit ("Credit") on a $/kW-Yr. basis. First, years 2015 - 2018 of the Credit are escalated by 1.88 percent per year and then multiplied by four.

Year	Surplus Capacity Credit $/kW - per Mo.	Surplus Capacity Credit $/kW-Yr.
2015	$ 3.01	$ 12.02
2016	$ 3.06	$ 12.25
2017	$ 3.12	$ 12.48
2018	$ 3.18	$ 12.71

Data Source: 2015 Surplus Capacity Credit and 1.88% escalation factor are from the Company's 2011 ERP.

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Line No.

8. Substitute the Surplus Capacity Credit derived in step 7, for the Adjusted Summer 1st CT cost $/kW-Yr. derived in step 6 to derive the Value of Capacity for years 2018-2027.

Year		Value of Capacity $/kW-Yr.
2018	$	12.71
2019	$	78.31
2020	$	80.75
2021	$	83.25
2022	$	85.82
2023	$	88.47
2024	$	91.19
2025	$	93.99
2026	$	96.86
2027	$	99.81

9. Levelize the 2018 - 2027 cost derived in step 8 by using the WACC after taxes (7.14%, Docket No. 11AL-947E) over the ten year term.

$	77.49

10. Divide the levelized cost derived in step 9 by 12 to derive a montly cost.

Levelized Yearly Cost			Months/Year	Monthly Cost ($/kW-Mo.)	
$	77.49		12	$	6.46

11. Take the monthly cost $/kW-Mo. derived in step 10 and apply the technology specific Generation Capacity Credit ("GCC").

Applying the GCC adjusts the capacity cost value to take into consideration the technology's contribution to capacity need.

	PV - TRACKING
Capacity Value ($/kW-mo):	$ 6.46
GCC by technology:	47%
Resource Capacity Value ($/kW-mo):	$ 3.04
Data Source:	PV GCC based on 2011 ERP ELCC studies.

12. Apply the technology specific annual capacity factor ("CF") to the cost derived in step 11 and convert the cost to a $/MWh basis.

	PV - TRACKING
Resource Capacity Value ($/kW-mo):	$ 3.04
Annual CF:	23.5%
Resource Capacity Value ($/MWH):	$ 17.69
Data Source:	CF: PV Tracking - PVWatt-SLV

13. Apply the value of avoided Transmission and Distribution (T&D) Investment:

	PV - TRACKING
Resource Capacity Value with Losses: ($/MWH)	$ 17.69
Avoided T&D Investment ($/MWH):	$ -
Resource Capacity Value with Losses and T&D: ($/MWH)	$ 17.69

Avoided Capacity Credit ($/kWh):	**$**	**0.01769**