

Audit & Finance Committee Meeting

May 9, 2022

Agenda

- Call to Order / Roll Call
- Public Comment (for items not on the Agenda)
- Action to set the Agenda and Approve Consent Items
- Chair Report
- Staff Report – None
- Regular Agenda

FY2021-2022

Q3 Financial Review

Ending March 31, 2021



Revenue – Quarterly Trend

Revenue by Quarter as of

March-22

Quarter	Revenue Comparison vs Budget		
	Actual	Budget	Var Fav/(Unf)
Q1-FY2020/21	75.1	69.3	5.8
Q2-FY2020/21	62.9	41.2	21.7
Q3-FY2020/21	46.3	49.7	(3.4)
Q4-FY2020/21	43.9	55.6	(11.7)
Total YTD 2020/21	\$228.1	\$215.7	\$12.4

Q1-FY2021/22	58.4	61.0	(2.6)
Q2-FY2021/22	45.1	52.5	(7.5)
Q3-FY2021/22	43.8	50.3	(6.5)
Q2-FY2021/22	0.0		0.0
Total YTD FY2021/22	\$147.2	\$163.8	(\$16.6)

Quarterly

- **Q3** Revenue was \$6.5 MM below Budget
 - Revenue was 12.9% below Budget while Load was 7.5% below Budget
 - Residential load was 9.6% below Budget
 - Rates and usage were lower than planned – more significantly in Residential use

YTD

- **Q3-YTD** Revenue is \$16.6 MM below Budget
 - Revenue is 10.1% below Budget while Load is 4.6% below Budget
 - Residential load is 8.2% below Budget.

Revenue – Monthly Trend

Revenue (Last 13 months)

March-22

Month	Revenue Comparison vs Budget		
	Actual	Budget	Var Fav/(Unf)
Mar-21	\$13.8	\$17.2	(\$3.4)
Apr-21	\$12.7	\$15.0	(\$2.2)
May-21	\$13.9	\$17.2	(\$3.4)
Jun-21	\$17.3	\$23.4	(\$6.1)
Jul-21	\$19.0	\$19.4	(\$0.3)
Aug-21	\$20.0	\$21.0	(\$0.9)
Sep-21	\$19.3	\$20.7	(\$1.4)
Oct-21	\$14.6	\$20.1	(\$5.5)
Nov-21	\$14.5	\$15.3	(\$0.8)
Dec-21	\$16.0	\$17.1	(\$1.1)
Jan-22	\$15.1	\$17.6	(\$2.5)
Feb-22	\$14.1	\$16.0	(\$1.9)
Mar-22	\$14.7	\$16.8	(\$2.1)

Cost of Energy – Quarterly Trend

Cost of Energy by Quarter as of

March-22

Quarter	COE Comparison vs Budget		
	Actual	Budget	Var Fav/(Unf)
Q1-FY2020/21	66.7	55.3	(11.4)
Q2-FY2020/21	51.2	51.0	(0.1)
Q3-FY2020/21	49.4	46.7	(2.8)
Q4-FY2020/21	46.5	44.4	(2.0)
Total YTD 2020/21	\$213.8	\$197.4	(\$16.4)

Q1-FY2021/22	56.5	57.6	1.1
Q2-FY2021/22	51.1	53.9	2.8
Q3-FY2021/22	56.2	52.9	(3.4)
Q2-FY2021/22	0.0		0.0
Q2-FY2021/22	\$163.8	\$164.4	\$0.6

Quarterly

- **Q3** Cost of Energy was \$3.4 MM above Budget
 - Cost was 6.4% above Budget despite lower Load than planned
 - Energy market prices were significantly higher than prior periods and higher than Budgeted levels
 - ~100% hedged position mitigated most of the higher prices throughout the quarter

YTD

- Cost of energy is slightly less than Budget for YTD as higher prices have been offset by lower usage levels

Cost of Energy – Monthly Trend

Cost of Energy (Last 13 months)

March-22

Month	COE Comparison vs Budget		
	Actual	Budget	Var Fav/(Unf)
Mar-21	\$15.9	\$15.2	(\$0.7)
Apr-21	\$15.4	\$14.1	(\$1.3)
May-21	\$16.9	\$14.5	(\$2.4)
Jun-21	\$14.1	\$15.8	\$1.7
Jul-21	\$18.4	\$17.9	(\$0.6)
Aug-21	\$20.6	\$20.4	(\$0.1)
Sep-21	\$17.5	\$19.3	\$1.8
Oct-21	\$17.4	\$18.0	\$0.6
Nov-21	\$15.0	\$16.7	\$1.7
Dec-21	\$18.8	\$19.3	\$0.5
Jan-22	\$20.3	\$18.8	(\$1.5)
Feb-22	\$17.6	\$17.2	(\$0.4)
Mar-22	\$18.4	\$16.9	(\$1.5)

Financial Statement vs. Budget – Quarter and YTD

	Quarter ending March 2022					
	Current Quarter			Year-to-date		
	Actual	Budget	Var Fav/(Unf)	Actual	Budget	Var Fav/(Unf)
OPERATING REVENUES						
Electricity Sales, net	43,206,075	49,690,391	(6,484,316)	145,147,054	161,850,672	(16,703,618)
Green electricity premium	633,665	644,905	(11,240)	2,101,242	1,982,977	118,265
Total Operating Revenues	43,839,740	50,335,296	(6,495,556)	147,248,296	163,833,649	(16,585,353)
OPERATING EXPENSES						
Cost of energy	56,225,928	52,856,863	(3,369,066)	163,831,443	164,383,966	552,523
Staff compensation	1,681,337	1,628,177	(53,160)	4,600,725	4,836,098	235,373
Data Manager	845,856	855,000	9,144	2,539,479	2,565,000	25,521
Service Fees - PG&E	313,248	315,000	1,752	928,290	945,000	16,710
Consultants & Professional Services	270,160	263,692	(6,468)	795,417	1,017,512	222,095
Legal	213,921	398,250	184,329	866,278	1,221,000	354,722
Marketing and Noticing	186,159	476,693	290,534	1,065,897	1,592,311	526,414
General and Administrative	571,247	582,929	11,683	1,539,589	1,685,327	145,738
Community Energy Programs	655,825	1,133,602	477,777	1,581,437	5,422,533	3,841,096
Depreciation	20,352	29,044	8,691	61,505	80,381	18,876
Total Operating Expenses	60,984,034	58,539,250	(2,444,784)	177,810,059	183,749,128	5,939,069
Operating Income (Loss)	(17,144,294)	(8,203,954)	(8,940,340)	(30,561,763)	(19,915,479)	(10,646,284)
Total Nonoperating Income/(Expense)	(4,194,768)	225,000	(4,419,768)	(4,515,493)	675,000	(5,190,493)
CHANGE IN NET POSITION	(21,339,061)	(7,978,954)	(13,360,108)	(35,077,256)	(19,240,479)	(15,836,777)
CHANGE IN NET POSITION						
Net Position at the beginning of period	166,605,204	173,009,695	(6,404,491)	180,343,399	184,271,220	(3,927,821)
Change in Net Position	(21,339,061)	(7,978,954)	(13,360,108)	(35,077,256)	(19,240,479)	(15,836,777)
Net Position at the end of period	145,266,143	165,030,742	(19,764,599)	145,266,143	165,030,742	(19,764,599)
Ending Total Cash (Restricted/Unrestricted)	138,837,795	168,264,090	(29,426,295)	138,837,795	168,264,090	(29,426,295)

YTD Results

- **Revenues**
 - \$16.6 MM below Budget for YTD
- **Expenses**
 - YTD - \$5.9 MM below Budget
 - All categories under Budget
 - Program expenses well-below Budget for YTD, but could be significant \$2MM catch-up payment before year-end
 - Losses in investment portfolio which is heavily dependent of fixed income markets that have been volatile and troublesome
- **Change in Net Position**
 - Q3 was negative \$21.3 MM, \$13.4 MM worse than Budget
 - YTD is negative \$35.1 MM, but expected to recover most of this shortfall before year-end as rates are expected to be significantly higher (more on this later in presentation)

Change in Net Position (Year-to-date)

Change in Net Position - YTD as of

March-22

Accounts	Year-to-date vs Budget		
	Actual	Budget	Var Fav/(Unf)
Revenues	\$147.2	\$163.8	(\$16.6)
Cost of Energy	163.8	164.4	0.6
Other Opex	14.0	19.4	5.4
Non-Opex/(Income)	4.5	(0.7)	(5.2)
Net Position	(\$35.1)	(\$19.2)	(\$15.8)

YTD

- CINP is \$15.8 MM worse loss than budgeted due to lower revenues than Budget

Change in Net Position - Year-over-year

March-22

Accounts	Year-over-year Comparison (YTD)		
	YTD 2021-22	YTD 2020-21	Var Fav/(Unf)
Revenues	\$147.2	\$184.2	(\$37.0)
Cost of Energy	163.8	167.4	3.5
Other Opex	14.0	13.8	(0.2)
Non-Opex/(Income)	4.5	0.4	(4.1)
Net Position	(\$35.1)	\$2.6	(\$37.7)

vs: Prior Year

- YTD of \$35.1 MM loss versus \$2.6 MM gain in prior year
- Revenues significantly lower than prior year

Cash and Investment Summary – Quarterly Trend

	Jun-19	Jun-20	Jun-21	Sep-21	Dec-21	Mar-22
Investment Account - USBank (Combined PFM/FRB)						
Asset Summary						
Cash & Equivalents	\$ 4,507,825	\$ 58,937,363	\$ 2,785,233	\$ 297,110	\$ 236,618	\$ 91,568
Fixed Income	\$ 90,743,561	\$ 105,343,286	\$ 153,947,396	\$ 138,960,485	\$ 138,137,049	\$ 129,037,454
Accrued Income		\$ 546,170	\$ 520,977	\$ 519,812	\$ 470,045	\$ 480,040
Ending Balance	\$ 95,251,385	\$ 164,826,819	\$ 157,253,606	\$ 139,777,407	\$ 138,843,713	\$ 129,609,062
Other Accounts (Unrestricted)						
Unrestricted - M&T LockBox			\$ 758,192	\$ -	\$ -	\$ -
Unrestricted - Wilmington LockBox	\$ 5,632,155	\$ 5,030,087	\$ 2,465,340	\$ 4,922,087	\$ 3,979,987	\$ 5,200,816
Operating Account - First Republic	\$ 3,299,345	\$ 5,834,142	\$ 4,340,702	\$ 6,123,653	\$ 2,585,297	\$ 1,953,448
Savings Account - First Republic	\$ 9,885,949	\$ 2,484,545	\$ 1,354,942	\$ 6,604,575	\$ 10,066,905	\$ 1,571,650
Other Accounts	\$ 573	\$ -	\$ -	\$ 36	\$ (13,570)	\$ 2,819
Subtotal Unrestricted (non-Investment accounts)	\$ 18,818,022	\$ 13,348,775	\$ 8,919,176	\$ 17,650,351	\$ 16,618,619	\$ 8,728,733
Other Accounts (Restricted)						
Restricted Cash - Wilmington LockBox	\$ 1,500,000	\$ 1,000,000	\$ 500,000	\$ 500,000	\$ 500,000	\$ 500,000
Restricted Cash - First Republic	\$ 11,665,799	\$ 31,386,560	\$ 3,949,194	\$ 3,308,546	\$ -	\$ -
Subtotal Restricted (non-Investment accounts)	\$ 13,165,799	\$ 32,386,560	\$ 4,449,194	\$ 3,808,546	\$ 500,000	\$ 500,000
Total Cash	\$ 127,235,206	\$ 210,562,154	\$ 170,621,976	\$ 161,236,304	\$ 155,962,332	\$ 138,837,795
Unrestricted Cash	\$ 114,069,407	\$ 178,175,594	\$ 166,172,782	\$ 157,427,758	\$ 155,462,332	\$ 138,337,795

Note: \$7.9 MM of cash is on deposit with CAISO and not reflected in this summary

Investment Manager balances at 03/31/2022:

- PFM = \$64.9 MM
- FRB = \$64.7 MM

Cash Reserves – Days Cash on Hand

	Actual March 31, 2022	Forecast June 30, 2022
Total Cash/Investments Balance	\$138,837,795	\$162,372,061
Restricted by Term/Covenant	500,000	
Unrestricted Cash (per Approved Reserve Policy)	\$138,337,795	\$162,372,061
Days Cash on Hand (per Approved Reserve Policy)	213	243
<u>Approved Reserve Policy (Days Cash on Hand)</u>	180	180
Unrestricted Operating Reserve Requirement (180 Days)	120,479,766	120,509,709
Unrestricted Cash in Excess of Current Reserve Policy	\$17,858,029	\$41,862,353

Financial Statement – Forecast Full Year FY2022

FY 2021-2022 Budget & Forecast	FY 2022	FY 2022	Variance	Variance
	Approved Budget	Forecasted Full Year FY2021-2022	Forecast \$ vs. FY21/22 Budget Fav/(Unf)	Forecast % vs. FY21/22 Budget Fav/(Unf)
OPERATING REVENUES				
Electricity Sales, net	219,619,107	236,757,514	17,138,407	7.8%
ECO100 Premium	2,621,034	2,764,175	143,141	5.5%
Total Operating Revenues	222,240,141	239,521,689	17,281,547	7.8%
OPERATING EXPENSES				
Cost of electricity	216,705,953	222,412,656	(5,706,703)	-2.6%
Personnel	6,464,275	6,132,735	331,540	5.1%
Data Manager	3,420,000	3,397,930	22,070	0.6%
Service Fees - PG&E	1,260,000	1,243,780	16,220	1.3%
Professional Services	1,351,204	1,060,014	291,190	21.6%
Legal	1,615,500	1,328,611	286,889	17.8%
Marketing and Noticing	2,068,197	1,710,255	357,942	17.3%
General and Administrative	2,259,391	2,106,435	152,956	6.8%
Community Energy Programs	6,555,671	4,887,752	1,667,919	25.4%
Depreciation	111,675	86,741	24,934	22.3%
Total Operating Expenses	241,811,865	244,366,909	(2,555,044)	-1.1%
Operating Income/(Loss)	(19,571,724)	(4,845,220)	14,726,504	75.2%
Total Non-operating Income/(Expense)	900,000	(1,983,245)	(2,883,245)	-320.4%
CHANGE IN NET POSITION	(18,671,724)	(6,828,465)	11,843,259	63.4%
CHANGE IN NET POSITION				
Net Position at the beginning of period	184,271,220	180,343,399	(3,927,821)	
Inc/(Dec) in Net Position	(18,671,724)	(6,828,465)	11,843,259	
Net Position at the end of period	165,599,497	173,514,934	7,915,437	
Approx. Cash & Cash Equivalents	168,332,845	162,372,061		
DCOH (Per Policy)	250	243		

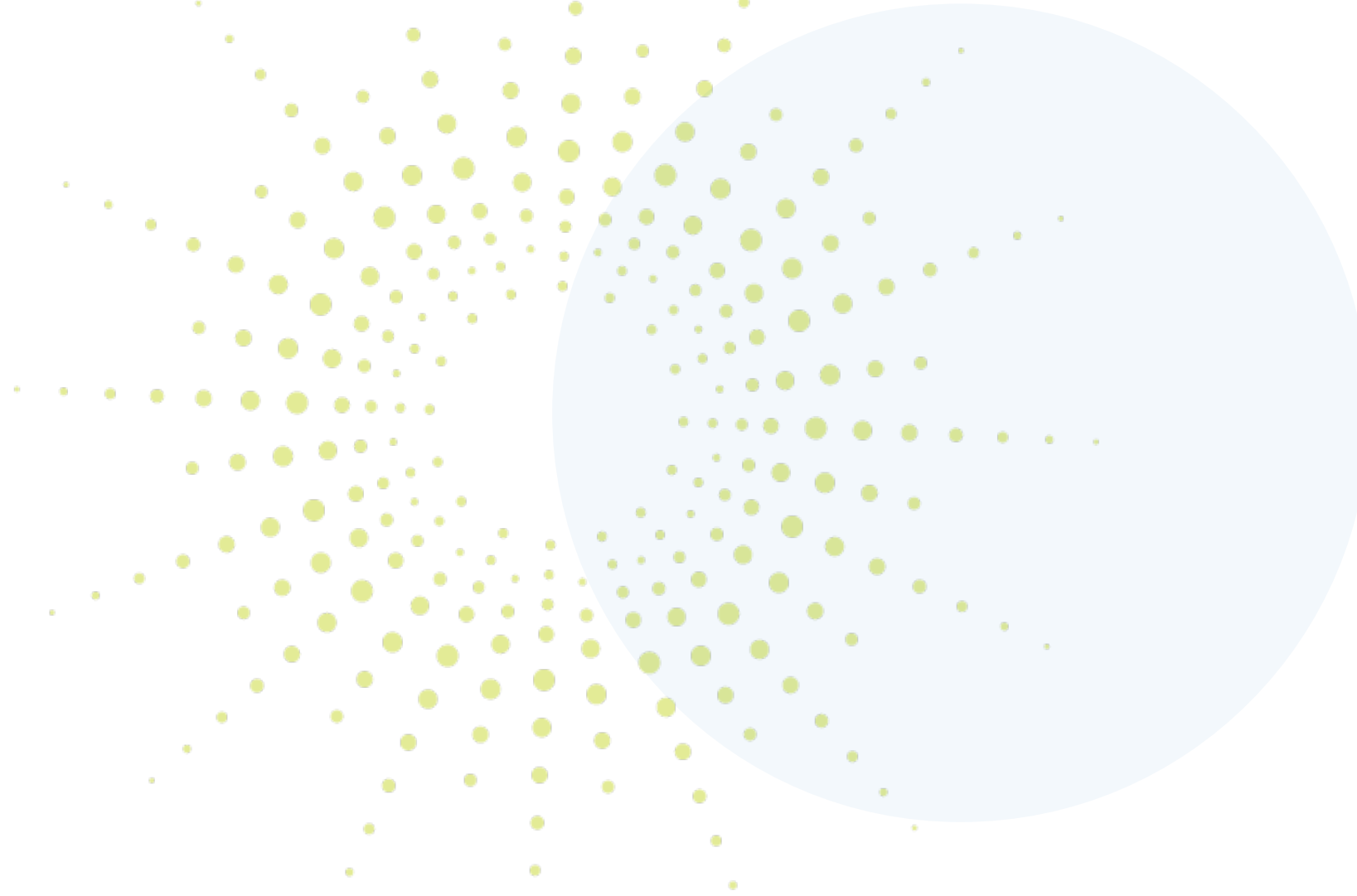
Substantial Improvement expected in Q4

- March YTD Change in Net Position is a loss of \$35.1 MM. Expect to end year at loss of just \$6.8 MM, a \$28.3 MM improvement
- PCE rates effective as of April 1 are expected to be more than double the prior level. Costs to ratepayers went up 33% on average. And the PCIA dropped significantly which will shift payments by ratepayers from PG&E to PCE (more on this in Draft Budget discussion section)

FY 2022-2023
(July 1, 2022 – June 30, 2023)

Budget Review

Initial Draft



Schedule – Budget Review and Approval

- May 9, 2022 – Review Initial Draft Budget with Audit & Finance Committee
- May 9, 2022 – Review Initial Draft Budget with Executive Committee
- May 26, 2022 – Review Current Draft Budget with Board of Directors
- June 13, 2022 – Review Revised Draft Budget with Audit & Finance Committee
- June 23, 2022 – Approve Final Budget by Board of Directors

Draft Budget FY2022-2023 – Key Assumptions

PG&E Generation Rates – significant rise in rates

- April 1, 2022 – increase 33%
- January 1, 2023 – decrease 10%
- Net change of up 20% as of 1/1/23 compared to 3/31/22
- San Mateo County and Los Banos rates are the same

PCIA Rates – significant decrease in rates

- April 1, 2022 – decrease 59%
- January 1, 2023 – increase 65%
- Net change of down 32% as of 1/1/23 compared to 3/31/22
- Los Banos PCIA rate is higher than SMC starting April 1, 2022. Lower starting on 1/1/23. Then, comparable after 1/1/24

Rates to PCE – up more than 100% through Jan 1, 2023 (although customers only pay an additional 33% in total)

Load – FY23 forecasted to be 3.2% higher than FY22 forecast – FY22 includes only 3 months of Los Banos load

Cost of Energy –

- Budgeted to increase 18% over FY22 forecast to \$263 million (includes \$15 million conservatism adder)
- Increase of 11% without conservatism adder

PG&E and PCIA Rate Change Summary

	1/1/2021	4/1/2021	4/1/2022	1/1/2023	1/1/2024	1/1/2025	1/1/2026
		Actual	Actual	Forecast	Forecast	Forecast	Forecast
PG&E Generation Rate	0.112	0.109	0.144	0.130	0.126	0.124	0.126
Generation Rate Change (Percent)			33%	-10%	-3%	-1%	1%
Cumulative % Change from 1/1/22			33%	20%	16%	15%	16%
PCIA (System Average)							
<u>San Mateo County</u>	0.032	0.047	0.019	0.032	0.033	0.031	0.028
PCIA Change (Percent)			-59%	65%	3%	-6%	-8%
Cumulative % Change from 1/1/22			-59%	-32%	-30%	-34%	-39%
PCE Rate to Ratepayers							
<u>San Mateo County</u>							
PCE Rate (net of PCIA and 5% Discount)	0.075	0.056	0.118	0.092	0.087	0.087	0.092
Net PCE Rate Change (Percent)			109%	-22%	-5%	0%	5%
Cumulative % Change from 1/1/22			109%	63%	55%	55%	62%
<u>Los Banos</u>		0.028	0.025	0.028	0.032	0.030	0.028
PCIA Change (Percent)			-11%	13%	16%	-6%	-9%
Cumulative % Change from 1/1/22			-11%	0%	16%	9%	-1%

Draft Budget FY23 – Summary



Current Fiscal Year FY22

Budget and Forecast	2022	2022	Variance - Fav/ (Unf)
Items	Approved Budget	Forecast	\$ Variance
OPERATING REVENUES			
Electricity Sales, net	219,619,107	236,757,514	17,138,407
Green electricity premium	2,621,034	2,764,175	143,141
	222,240,141	239,521,689	17,281,547
OPERATING EXPENSES			
Cost of energy	216,705,953	222,412,656	(5,706,703)
Staff compensation	6,464,275	6,132,735	331,540
Data Manager	3,420,000	3,397,930	22,070
Service Fees - PG&E	1,260,000	1,243,780	16,220
Consultants & Professional Services	1,351,204	1,060,014	291,190
Legal	1,615,500	1,328,611	286,889
Communications and Noticing	2,068,197	1,710,255	357,942
General and Administrative	2,259,391	2,106,435	1,152,272
Community Energy Programs	6,555,671	4,887,752	1,667,919
Depreciation	111,675	86,741	24,934
Total Operating Expenses	241,811,865	244,366,909	(1,555,728)
Operating Income (Loss)	(19,571,724)	(4,845,220)	15,725,820
NON-OPERATING REVENUES (EXP.)			
Total Nonoperating Income/(Expense)	900,000	(1,983,245)	(2,883,245)
CHANGE IN NET POSITION	(18,671,724)	(6,828,465)	12,842,575
Net Position at the beginning of period	184,271,220	180,798,537	(3,472,684)
Net Position at the end of period	165,599,497	173,970,072	9,369,891

2023	Variance Initial Budget vs. Prior Year Forecast	
Initial Budget	\$ Change - Inc/(Dec)	% Change
364,961,141	128,203,627	54%
2,822,550	58,375	2%
367,783,691	128,262,002	54%
262,900,760	40,488,104	18%
8,249,693	2,116,958	35%
3,600,000	202,070	6%
1,350,000	106,220	9%
1,431,813	371,799	35%
1,474,000	145,389	11%
2,686,208	975,953	57%
2,359,806	253,371	12%
8,640,000	3,752,248	77%
96,000	9,259	11%
292,788,280	48,421,371	20%
74,995,411	79,840,631	
600,000	2,583,245	
75,595,411	82,423,876	
173,970,072		
249,565,483		

Total Cash & Cash Equivalents	168,332,845	162,964,482	(5,368,362)
Unrestricted Cash Days on Hand	250	243	

238,559,894		
297		

Draft Budget Detail - Revenues

Current Fiscal Year FY22

Budget and Forecast	
Items	2022
	Forecast
OPERATING REVENUES	
Electricity Sales, net	236,757,514
Commercial - Demand	19,060,125
Streetlight and Agr- Demand	258,039
Commercial - Gen	112,412,969
Residential - Gen	103,186,947
Street lighting and Agr - Gen	2,213,075
CAPP Proceeds	1,667,791
Bad Debt Expense	(2,041,432)
Green electricity premium	2,764,175
	239,521,689



Initial Fiscal Year Budget FY23

2023	Variance Initial Budget vs. Prior Year Forecast	
Initial Budget	\$ Change - Inc/(Dec)	% Change
364,961,141	128,203,627	54%
19,622,891	562,766	3%
155,461	(102,577)	-40%
176,626,802	64,213,833	57%
166,666,713	63,479,766	62%
3,723,249	1,510,174	68%
-	(1,667,791)	-100%
(1,833,976)	207,457	-10%
2,822,550	58,375	2%
367,783,691	128,262,002	54%

Draft Budget FY2022-2027 – Budget Summary & 5-year Plan

Current Fiscal Year FY22			Fiscal Year Projections				
Budget and Forecast	2022	2022	2023	2024	2025	2026	2027
Items	Approved Budget	Forecast	Initial Budget	Forecast	Forecast	Forecast	Forecast
OPERATING REVENUES							
Electricity Sales, net	219,619,107	236,757,514	364,961,141	315,583,351	310,221,811	321,390,127	334,096,231
Green electricity premium	2,621,034	2,764,175	2,822,550	2,973,323	3,132,849	3,301,644	3,480,252
	222,240,141	239,521,689	367,783,691	318,556,673	313,354,660	324,691,771	337,576,483
OPERATING EXPENSES							
Cost of energy	216,705,953	222,412,656	262,900,760	266,150,723	259,404,029	261,318,950	265,549,966
Staff compensation	6,464,275	6,132,735	8,249,693	8,742,875	9,265,647	9,819,786	10,407,173
Data Manager	3,420,000	3,397,930	3,600,000	3,708,000	3,819,240	3,933,817	4,051,832
Service Fees - PG&E	1,260,000	1,243,780	1,350,000	1,390,500	1,432,215	1,475,181	1,519,437
Consultants & Professional Services	1,351,204	1,060,014	1,431,813	1,454,973	1,453,785	1,450,217	1,449,390
Legal	1,615,500	1,328,611	1,474,000	1,505,320	1,538,876	1,574,838	1,613,390
Communications and Noticing	2,068,197	1,710,255	2,686,208	2,916,529	3,129,555	3,218,162	3,309,427
General and Administrative	2,259,391	2,106,435	2,359,806	2,420,600	2,485,030	2,553,341	2,625,797
Community Energy Programs	6,555,671	4,887,752	8,640,000	13,750,000	15,550,000	18,850,000	23,000,000
Depreciation	111,675	86,741	96,000	96,000	96,000	96,000	96,000
Total Operating Expenses	241,811,865	244,366,909	292,788,280	302,135,520	298,174,377	304,290,293	313,622,411
Operating Income (Loss)	(19,571,724)	(4,845,220)	74,995,411	16,421,154	15,180,283	20,401,478	23,954,072
NON-OPERATING REVENUES (EXP.)							
Total Nonoperating Income/(Expense)	900,000	(1,983,245)	600,000	618,000	636,540	655,636	675,305
CHANGE IN NET POSITION	(18,671,724)	(6,828,465)	75,595,411	17,039,154	15,816,823	21,057,115	24,629,377
Net Position at the beginning of period	184,271,220	180,798,537	173,970,072	249,565,483	266,604,637	282,421,460	303,478,574
Net Position at the end of period	165,599,497	173,970,072	249,565,483	266,604,637	282,421,460	303,478,574	328,107,951
Total Cash & Cash Equivalents	168,332,845	162,964,482	238,559,894	255,599,047	271,415,870	292,472,985	317,102,362
Unrestricted Cash Days on Hand	250	243	297	309	332	351	369

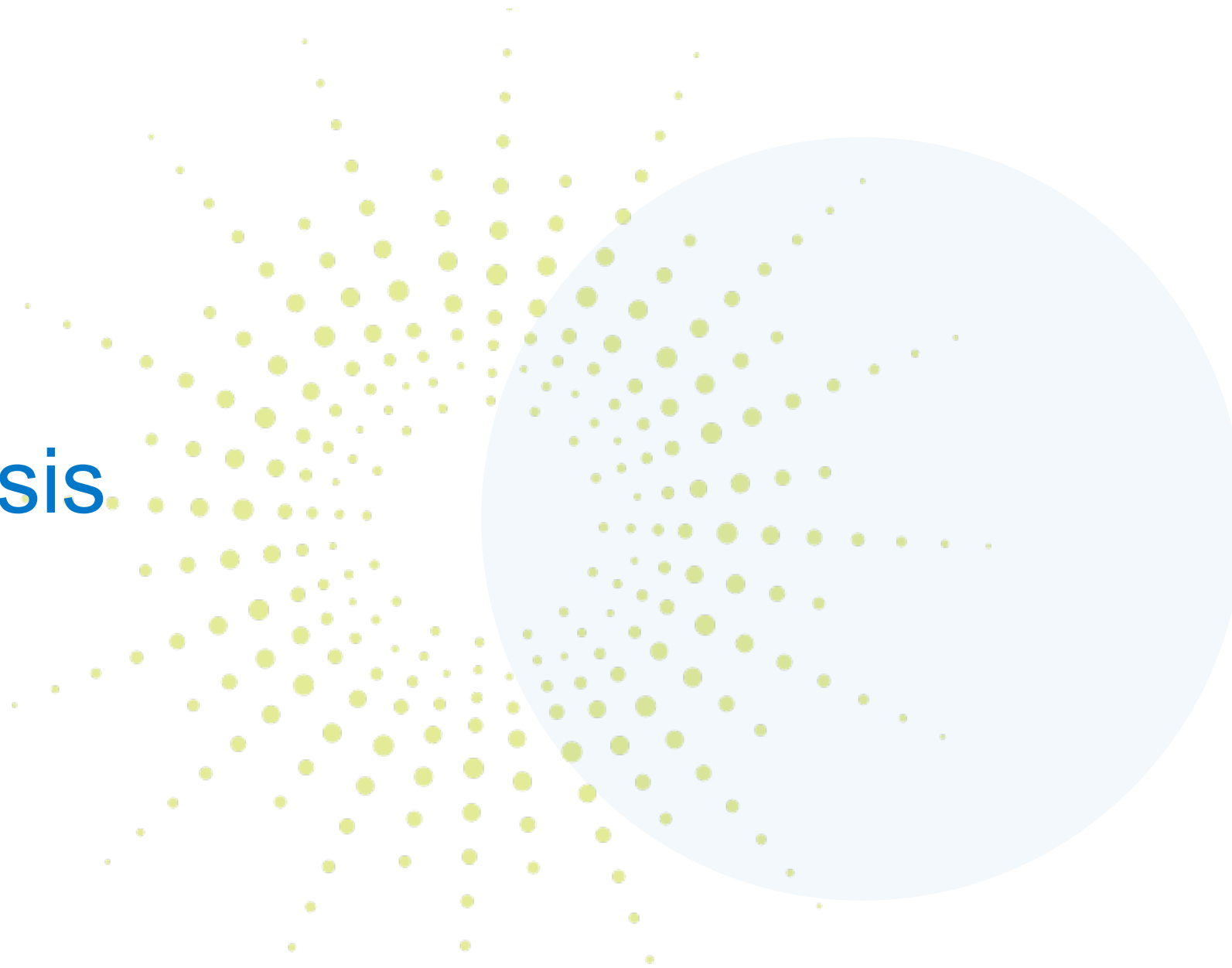
Overview of Stochastic Modeling to Evaluate and Measure Risk to Cost of Energy

5/9/2022

Agenda

- Stochastic Analysis
- Background
- Hourly Simulation Examples
- Cost of Energy
- Load

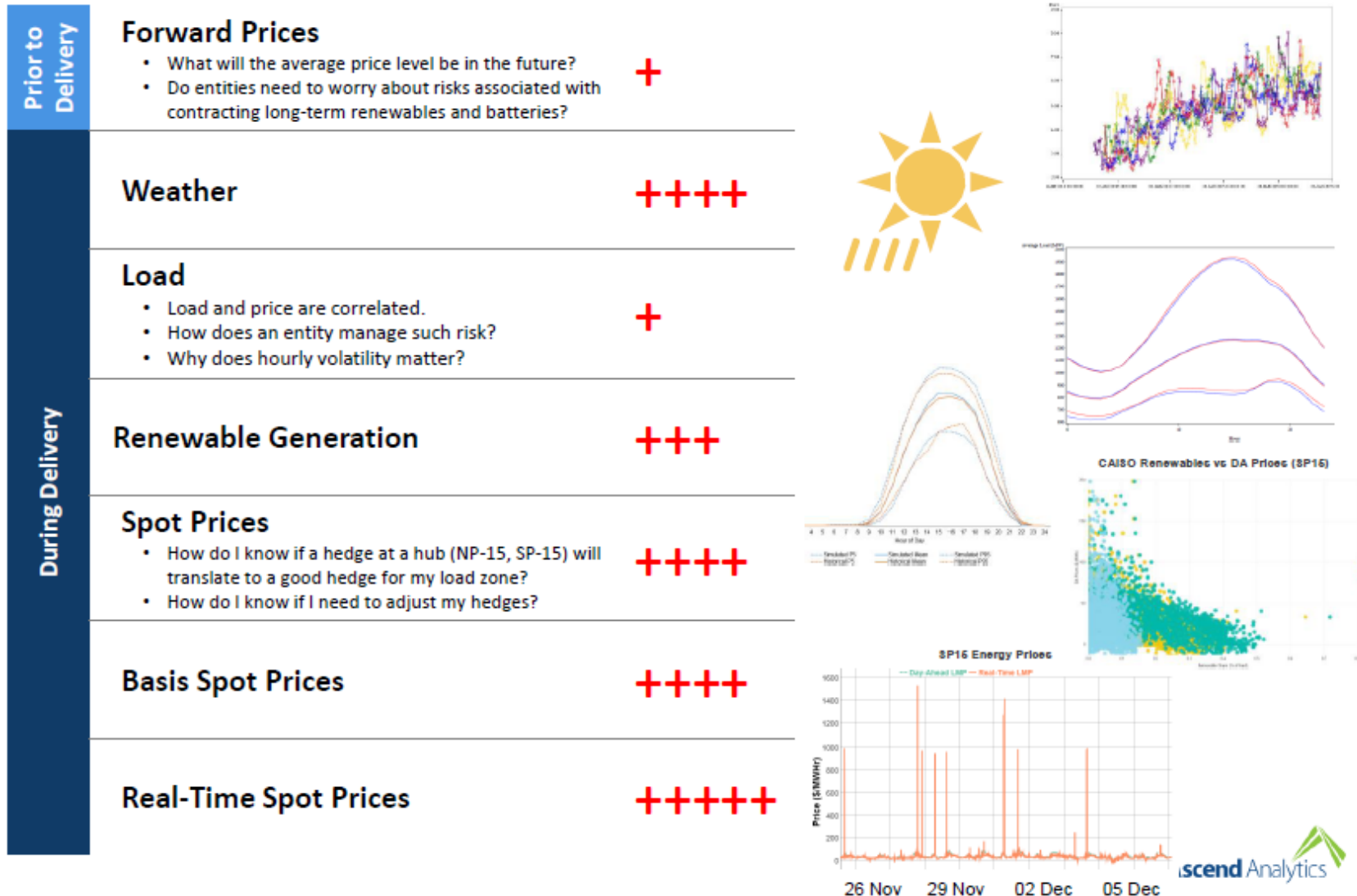
Stochastic Analysis



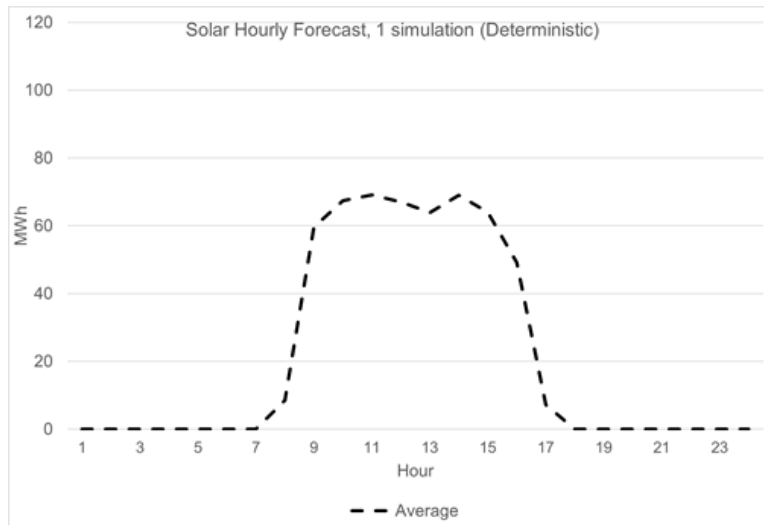
Modeling Risk/Uncertainty

- The current process for modeling the budgeted cost of energy is deterministic – there is one set of inputs and one output for the cost of energy
- However, there is uncertainty associated with a number of the inputs into the cost of energy – load, resource generation, market prices
- To model the impact of uncertainty in our forecasts, we can use a stochastic model to evaluate multiple simulations
- Stochastic modeling can help us to understand the risk associated with our budget due to uncertainty

Big Drivers of Risk

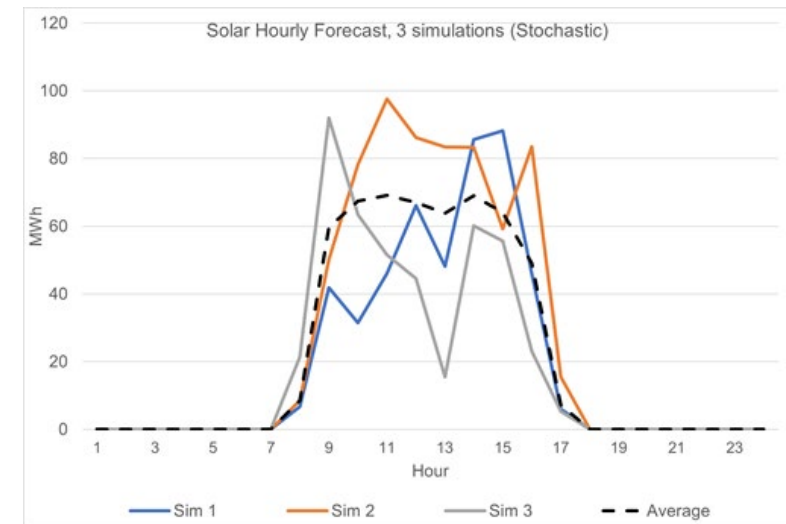


Deterministic vs Stochastic Simulation



Deterministic approach looks at 1 simulation without uncertainty.

Stochastic approach captures the uncertainty around renewable generation by looking at multiple simulations.



Importance of Stochastic Analysis

- Stochastic analysis helps us to better understand the risks associated with PCE's portfolio and find ways to manage and minimize risks
 - Co-simulation of load and prices (load and prices are correlated)
 - Simulate uncertainty around forecasts for:
 - Market prices
 - Load MWh
 - Renewable generation

Software for Stochastic Simulation

- Performing stochastic analysis is complicated and requires specialized knowledge and tools
 - We initially performed deterministic analyses using a variety of Excel and Python modeling tools mostly developed internally
 - As the complexity of our power portfolio has increased, the complexity of our analysis needs has increased as well.
 - 3rd party tools and services provide a more rigorous and sophisticated approach to modeling including the use of stochastic analysis tools which will better analyze the inherently incremental nature of renewable resources

Pilot for Stochastic Models

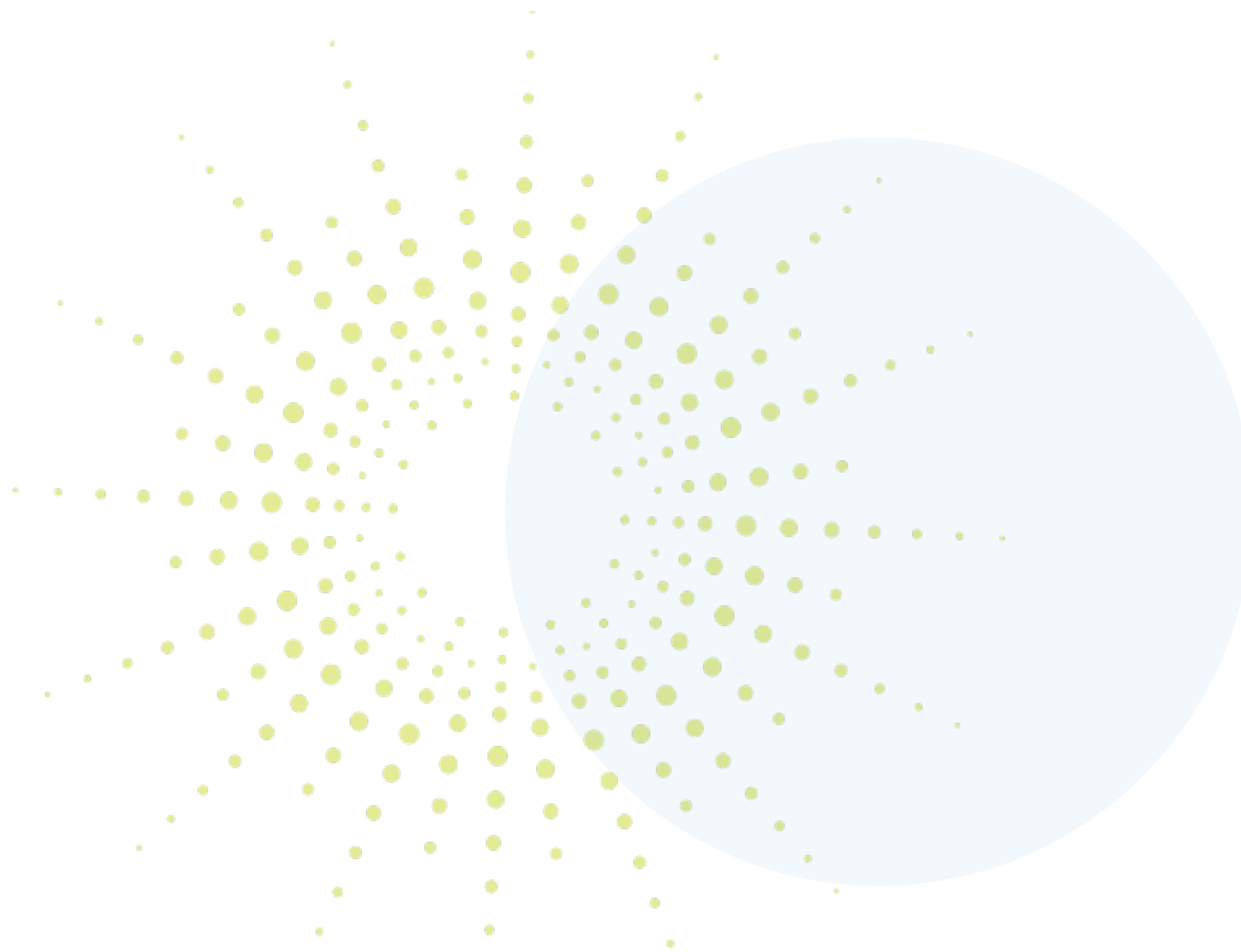
- PCE engaged in short-term pilots to test two tools that provide stochastic modeling functionality Ascend Analytics and cQuant.io
 - Both are software providers that can provide specialized services in portfolio analysis, budget planning, and long-term resource planning
 - We performed extensive analysis and modeling to test both options and concluded that Ascend's software (PowerSimm) includes features/capabilities that better suites our needs

Ascend Analytics

- Energy software company founded in 2002 in Boulder, CO – 20+ years experience
 - Software has been tested over many years and by many clients
- Several integrated software products for operations, portfolio analytics, and planning
- Provide custom analytical solutions and consulting
- Serves many CCA and utility clients -



Background



Motivation

- Provide a range of likely outcomes for cost of energy instead of just one single deterministic number
- Evaluate the risk associated with our portfolio and understands the biggest contributors

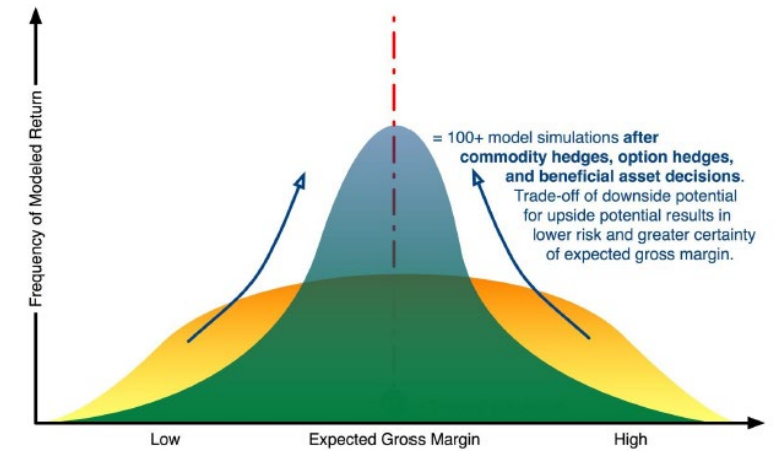
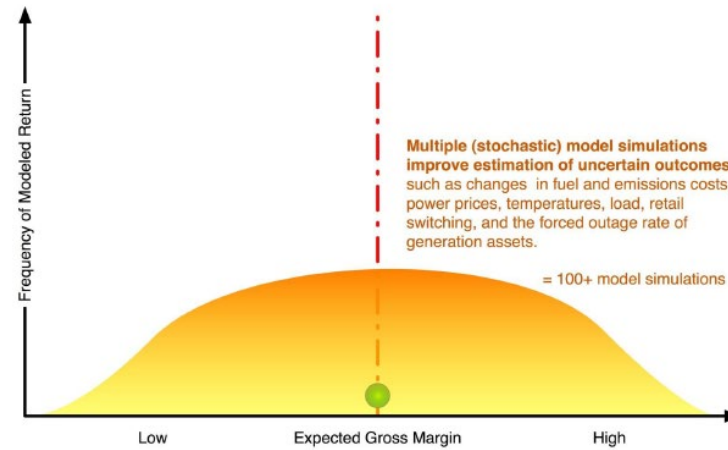
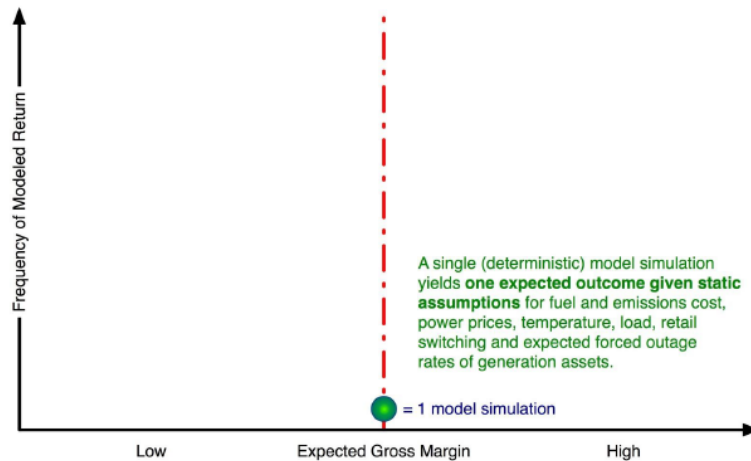
Budget Process

- Work with Finance team to develop our base budget using deterministic Excel model
- Run budget through PowerSimm
 - Use same inputs from our budget and evaluate in PowerSimm stochastic model to understand risks associated with the budget
- Main Differences
 - Excel model: 1 simulation for load, prices and renewable generation
 - PowerSimm: 50 simulations for load, prices, and renewable generation

Stochastic Simulation

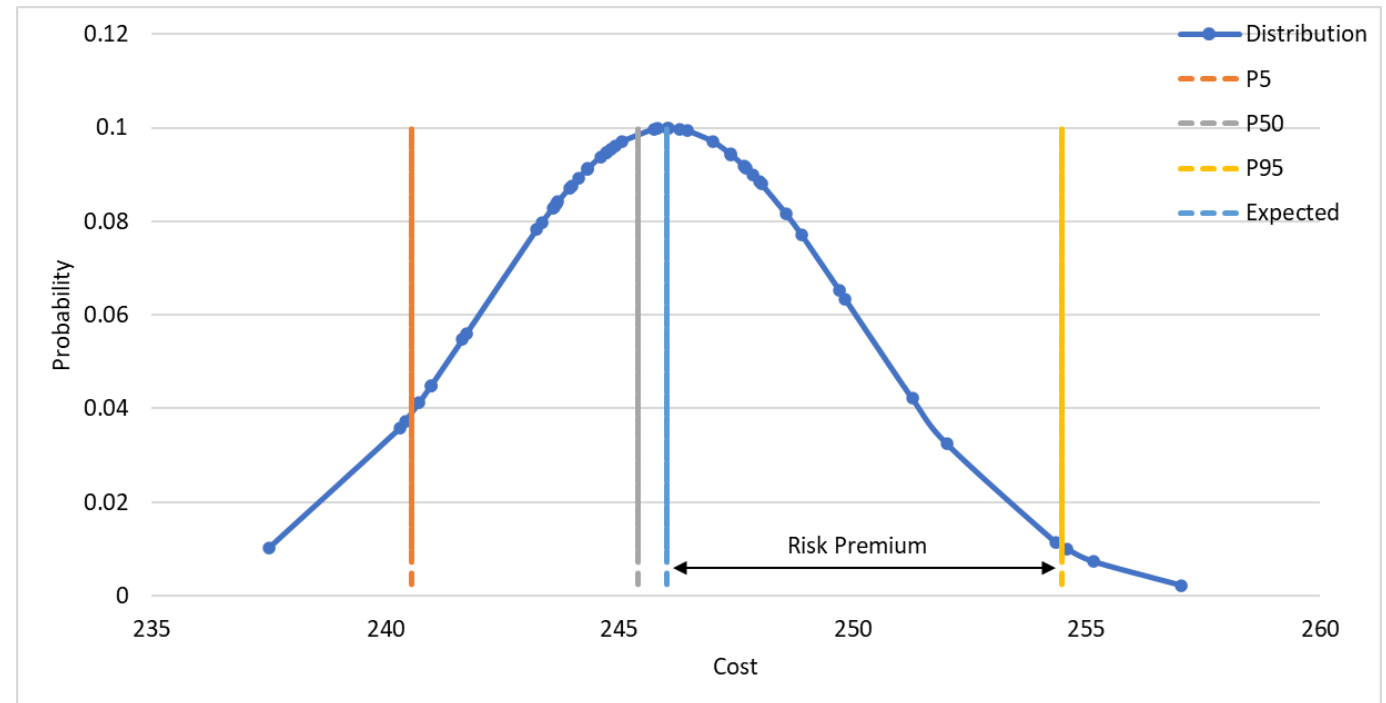
- 50 simulations for load, prices, and renewable generation in PowerSimm
 - Monthly load MWhs match monthly load MWhs in budget, but PowerSimm simulates 50 different hourly profiles based on our historical load data
 - Monthly renewable generation MWhs match Monthly MWhs in budget, but PowerSimm simulates 50 different hourly profiles based on historical renewable data
 - Average monthly prices match average monthly prices in budget, but PowerSimm simulates 50 different hourly profiles based on historical prices

Deterministic vs Stochastic

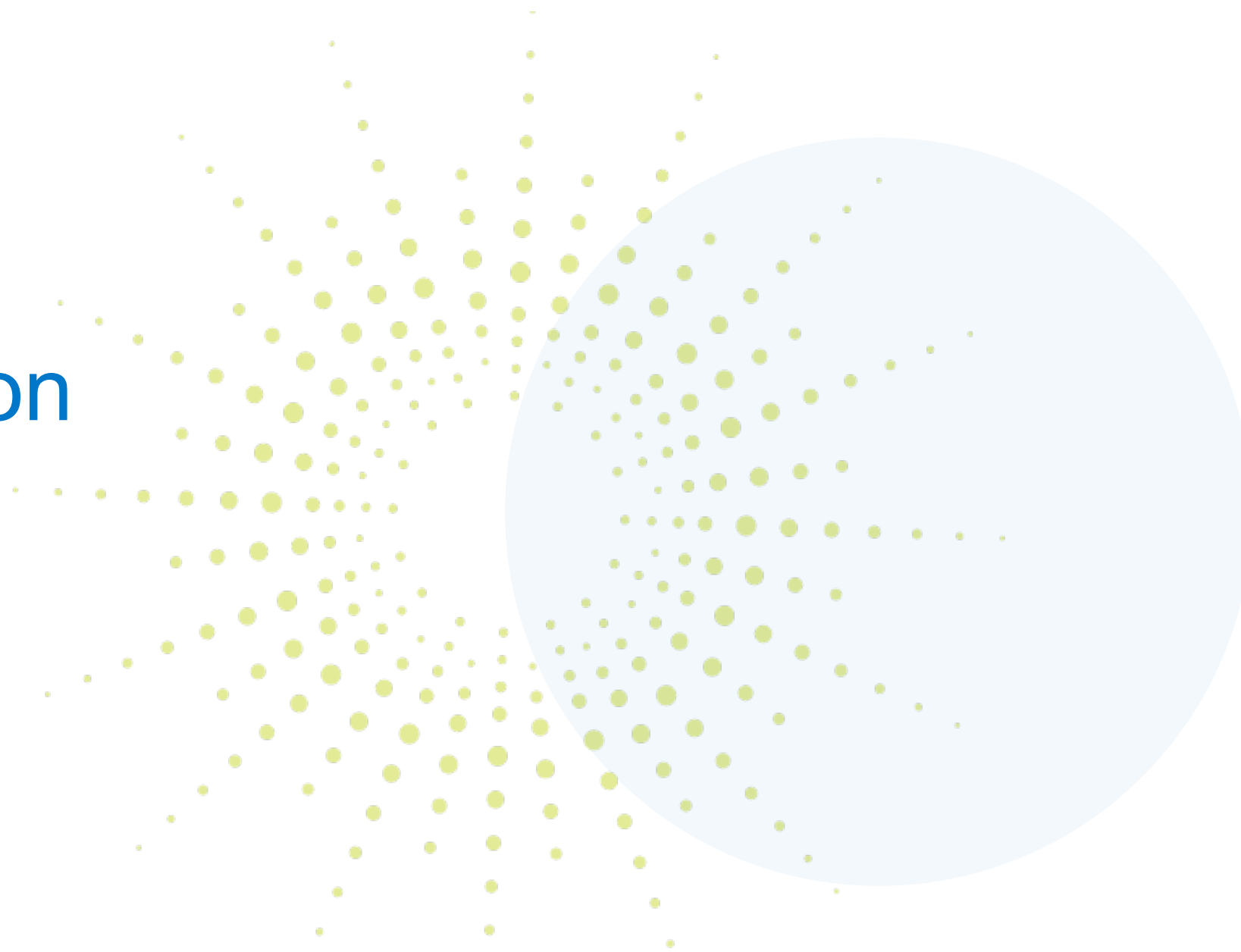


Stochastic Results

- There are several main metrics to look at in a stochastic analysis:
 - Expected: Average value across all simulations
 - P5 or 5th percentile: only 5 percent of values are smaller than P5
 - P50 or median: 50 percent of values are smaller and 50 percent are bigger than P50
 - P95: only 5 percent of values are bigger than P95
 - Risk Premium: The difference between P95 and P50 is referred to as risk premium

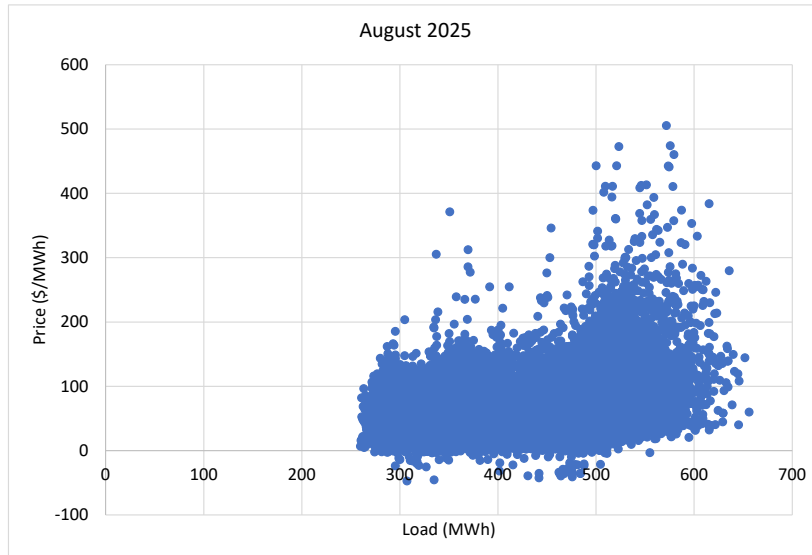


Hourly Simulation Examples

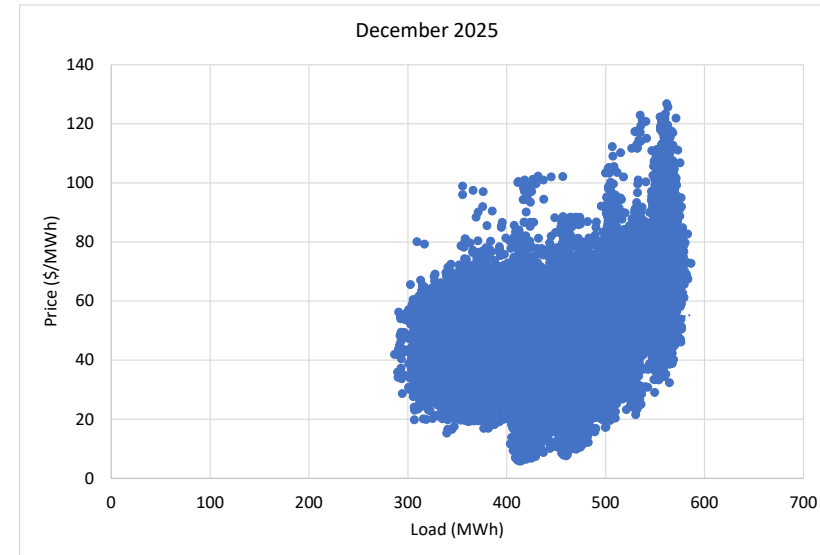


Price-Load Correlation

- In general, higher load results in higher prices but load is not the only driver behind prices



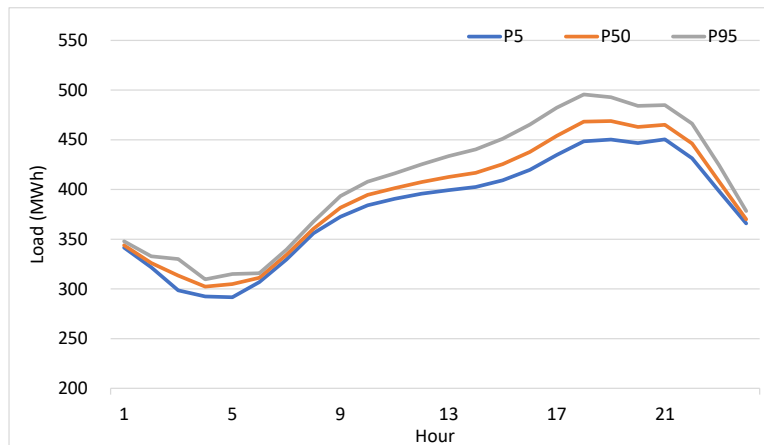
* Each dot, represent a single hour, hourly data for 50 simulations shown here



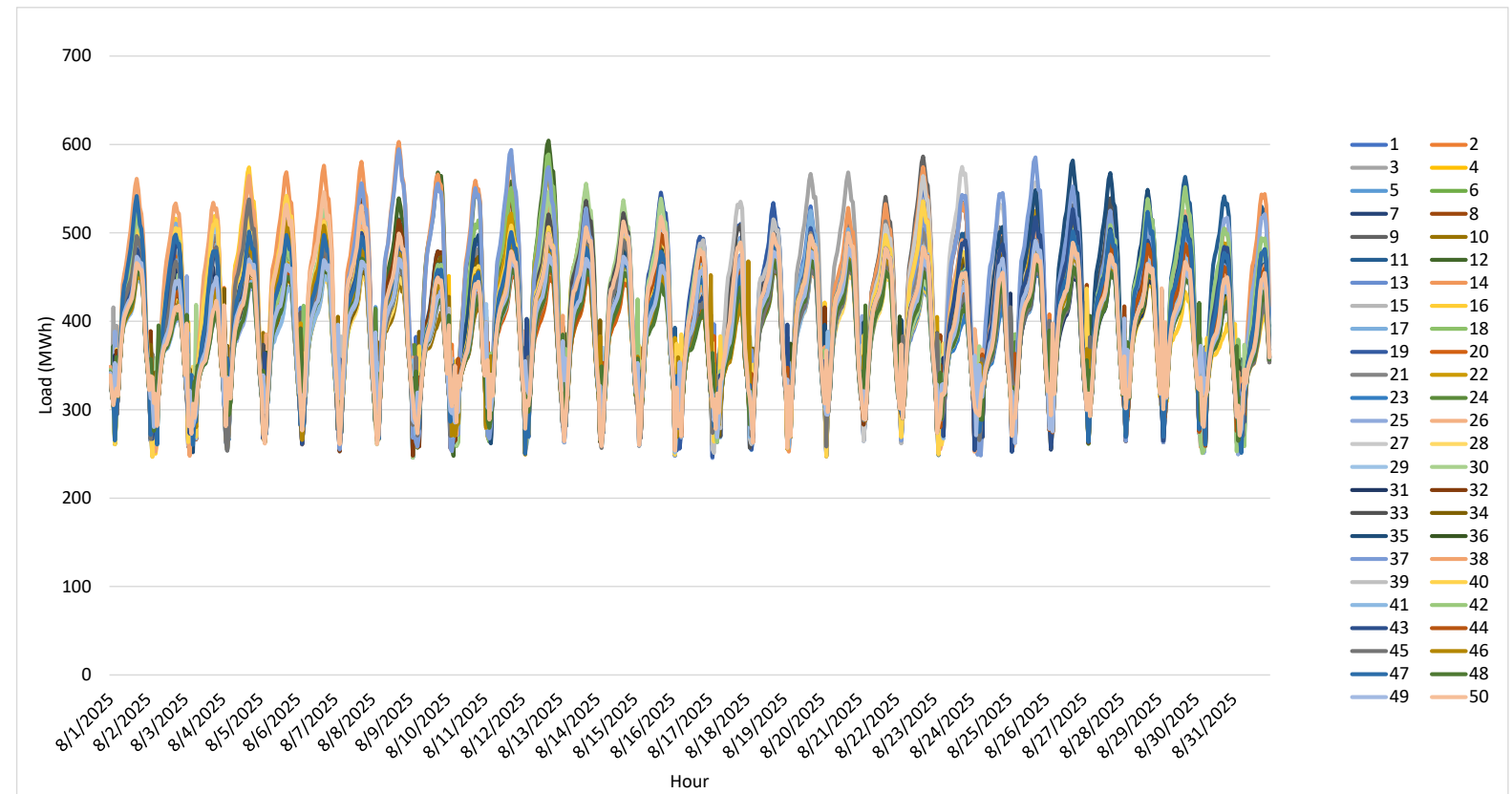
* Each dot, represent a single hour, hourly data for 50 simulations shown here

Hourly Load Simulation

- 50 hourly trends (simulations) for load. Shapes are created based on our historical load.



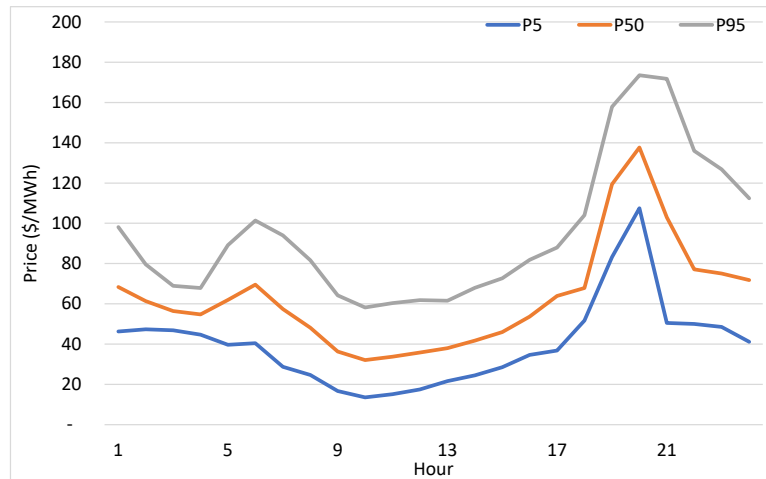
* P5, P50 and P95 of simulations, August of 2025, Month-Hour Average



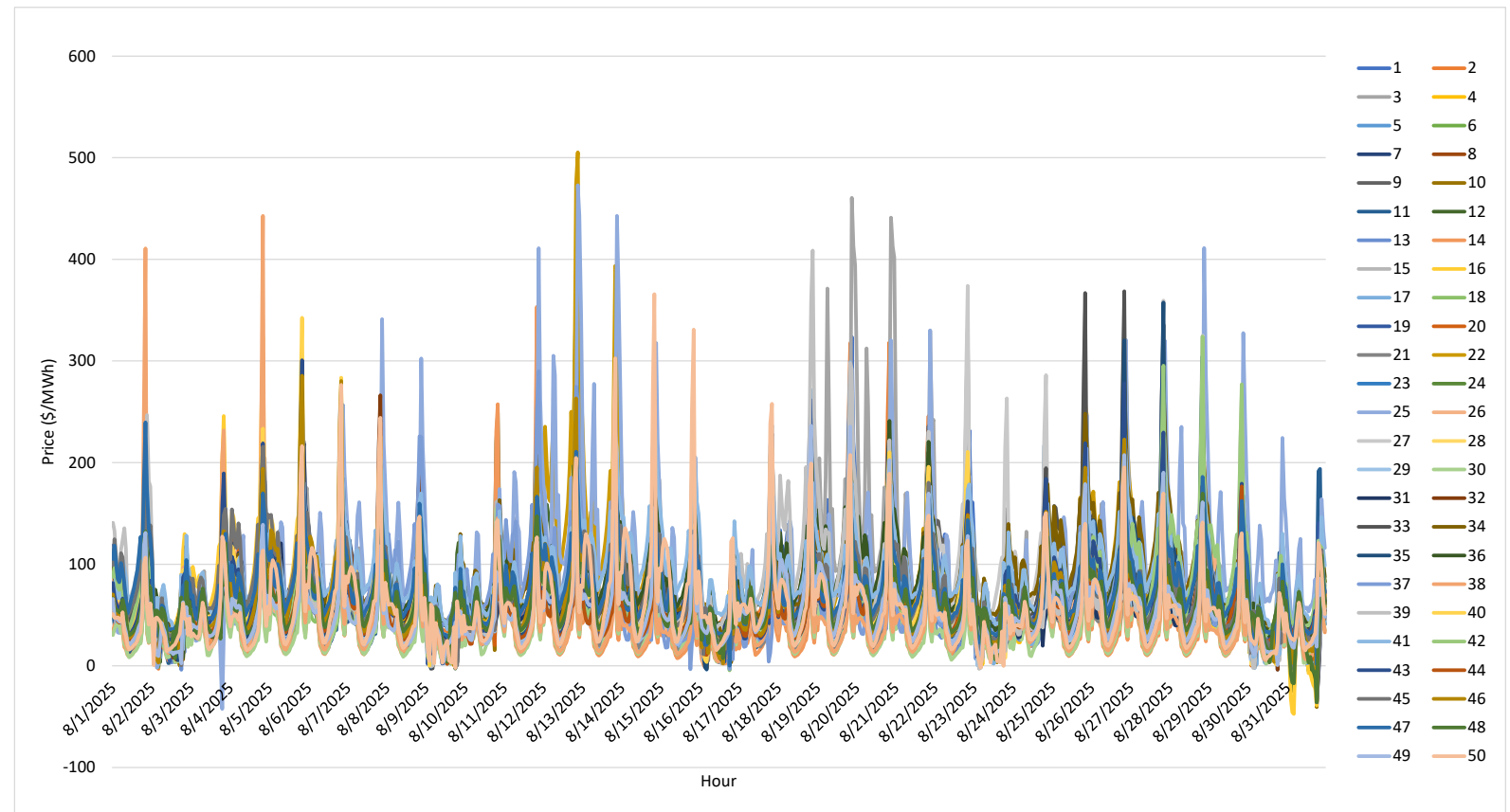
* 50 simulations, August of 2025

Hourly Price Simulation

- 50 hourly trends (simulations) for prices. Shapes are created based on forecasted future price shapes.



* P5, P50 and P95 of simulations, August of 2025, Month-Hour Average

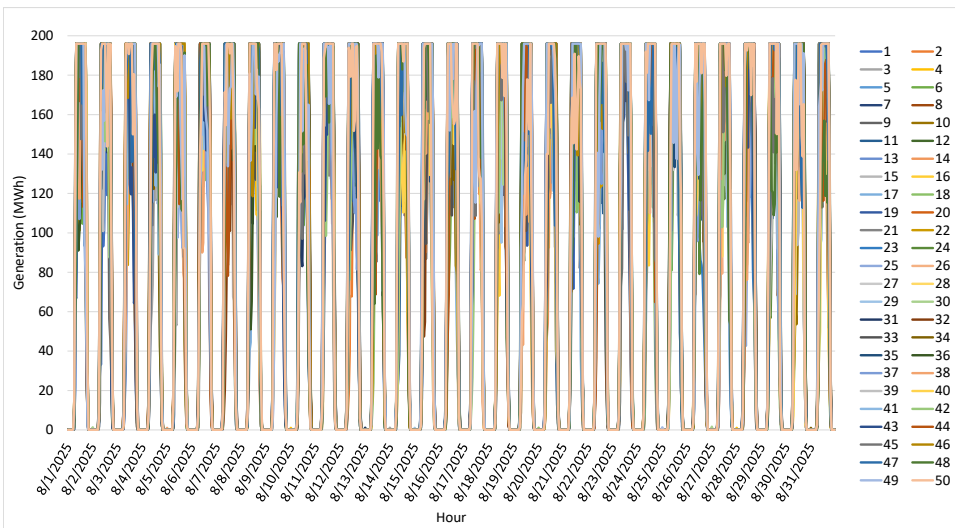


* 50 simulations, August of 2025

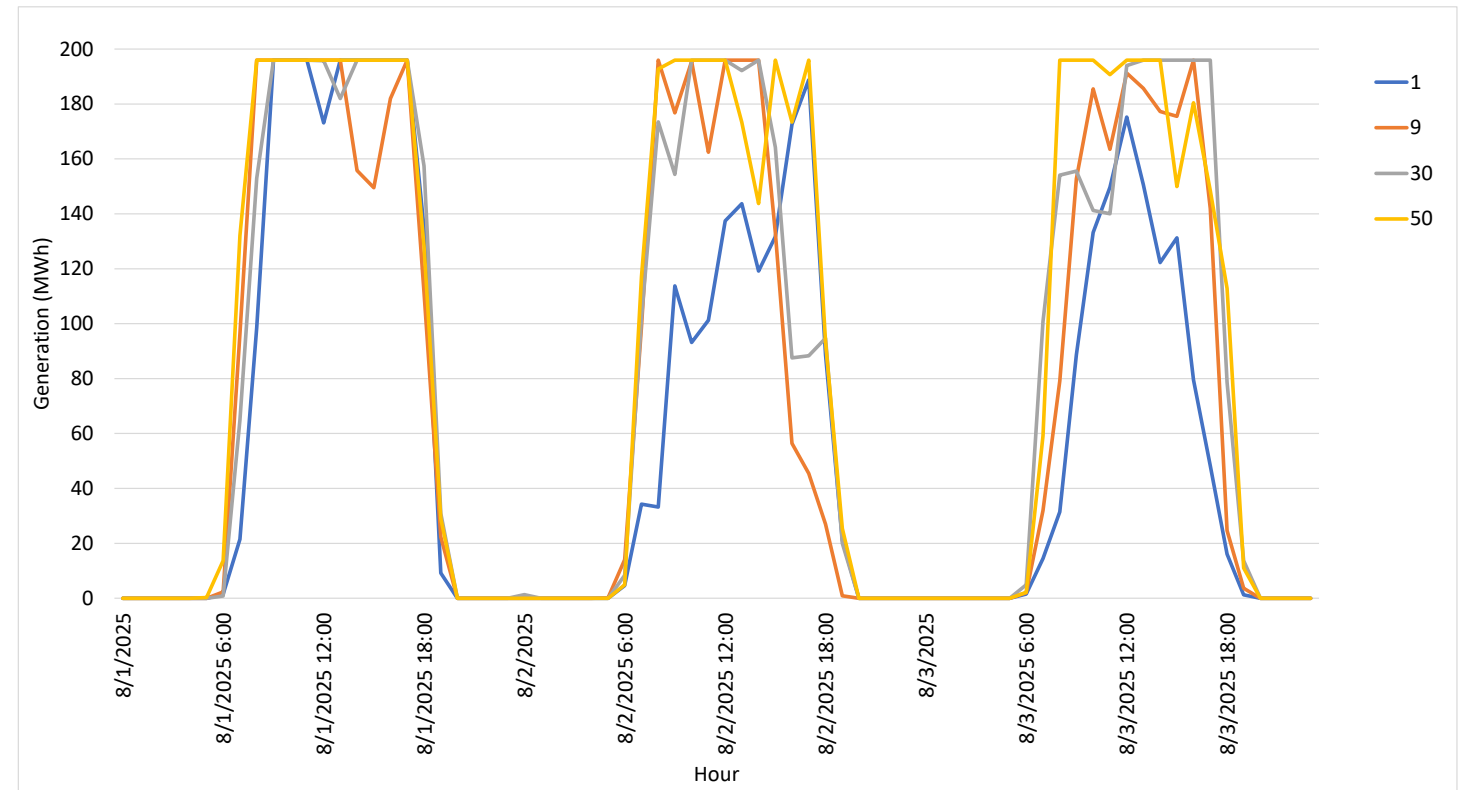
* Prices shown here are for DLAP-PG&E node

Hourly Solar Generation Simulation

- 50 hourly trends (simulations) for solar generation. Shapes are created based on historical solar generation.



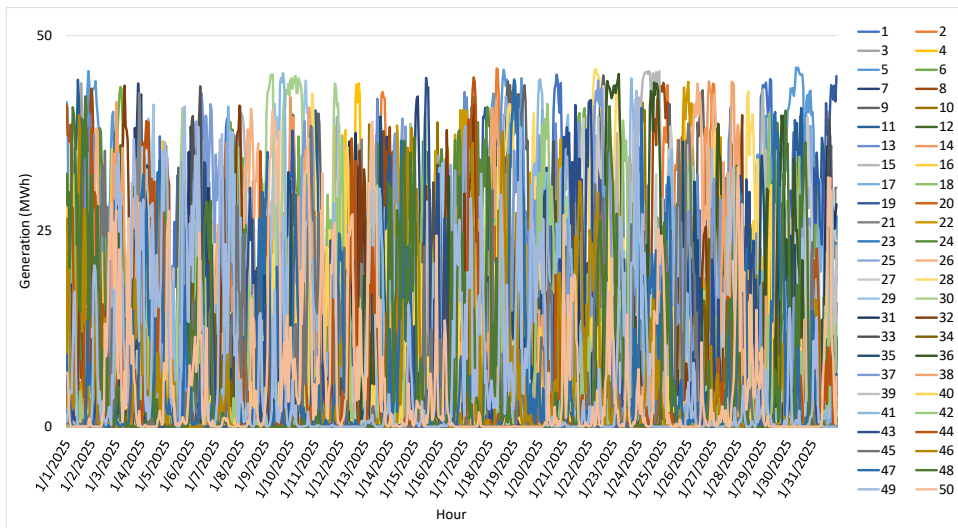
* 50 simulations, August of 2025



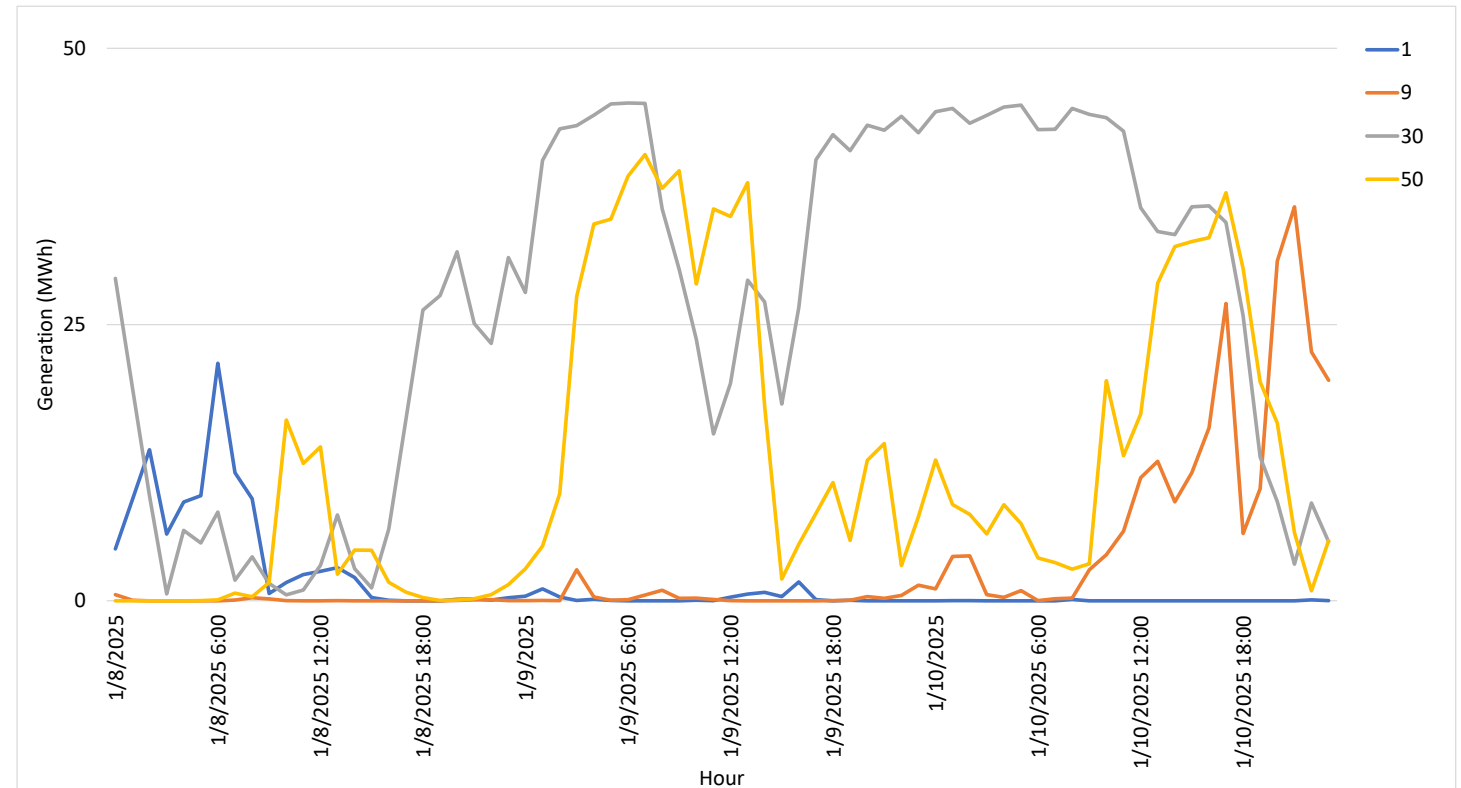
* 4 simulations, 8/1/2025-8/3/2025

Hourly Wind Generation Simulation

- 50 hourly trends (simulations) for wind generation. Shapes are created based on historical wind generation.

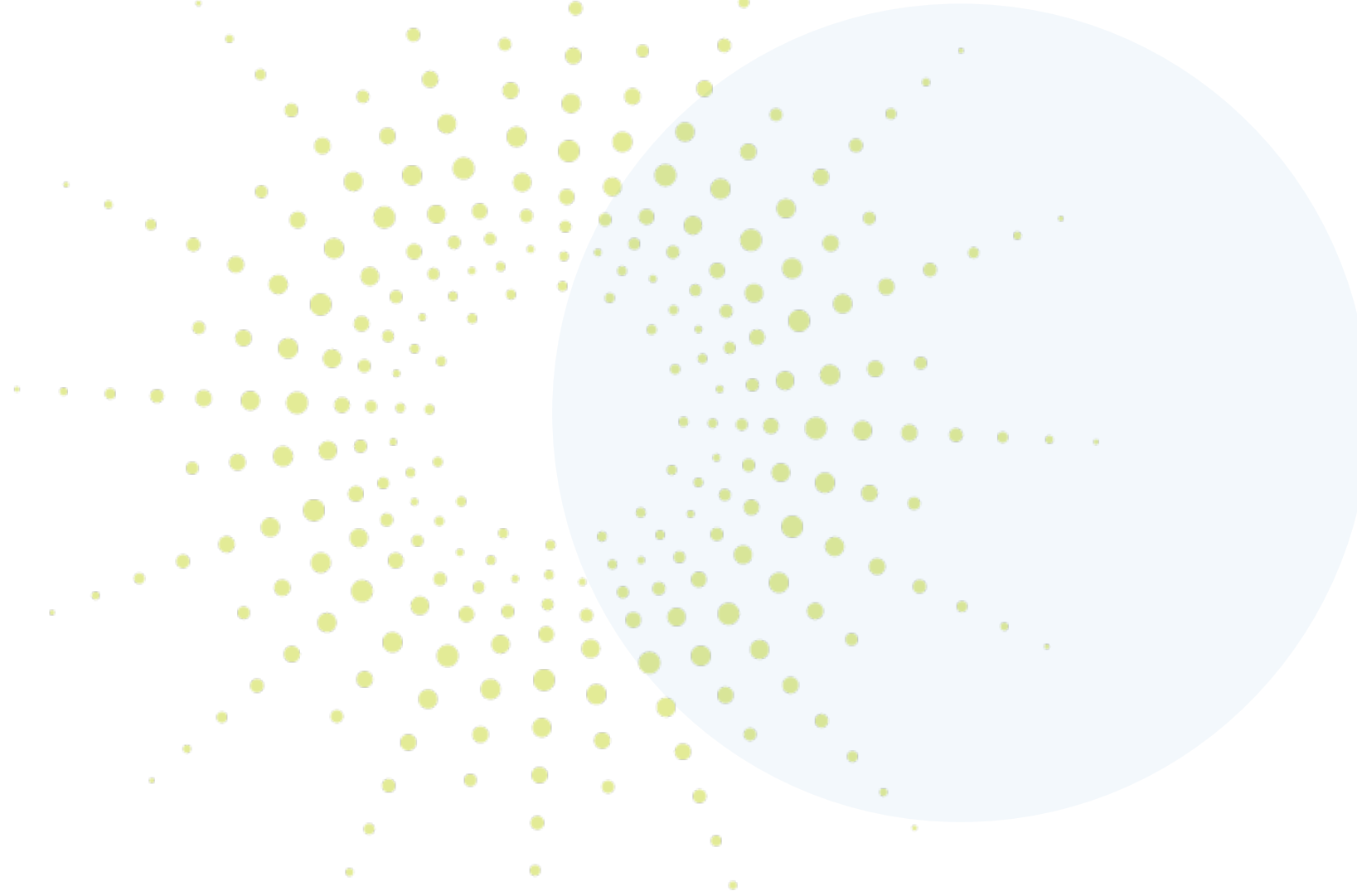


* 50 simulations, August of 2025



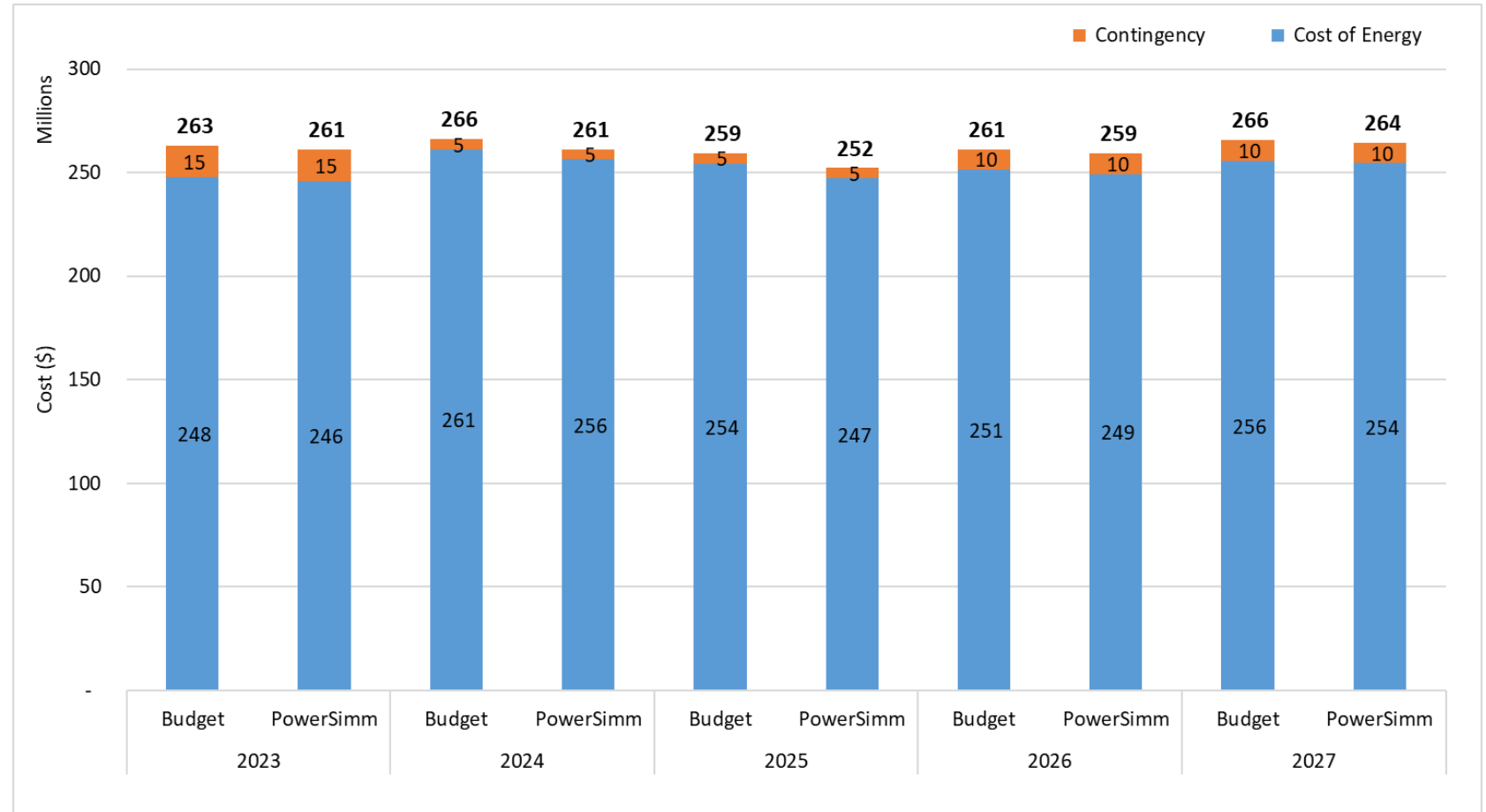
* 4 simulations, 1/8/2025-1/10/2025

Cost of Energy



Cost of Energy Summary

- PowerSimm values are averaged across 50 simulations
 - There are slight differences in how the models treat certain assumptions including resale of RECs/RA.
 - We are working with Ascend to update/modify modeling to more accurately reflect how these assumptions are treated in our budget

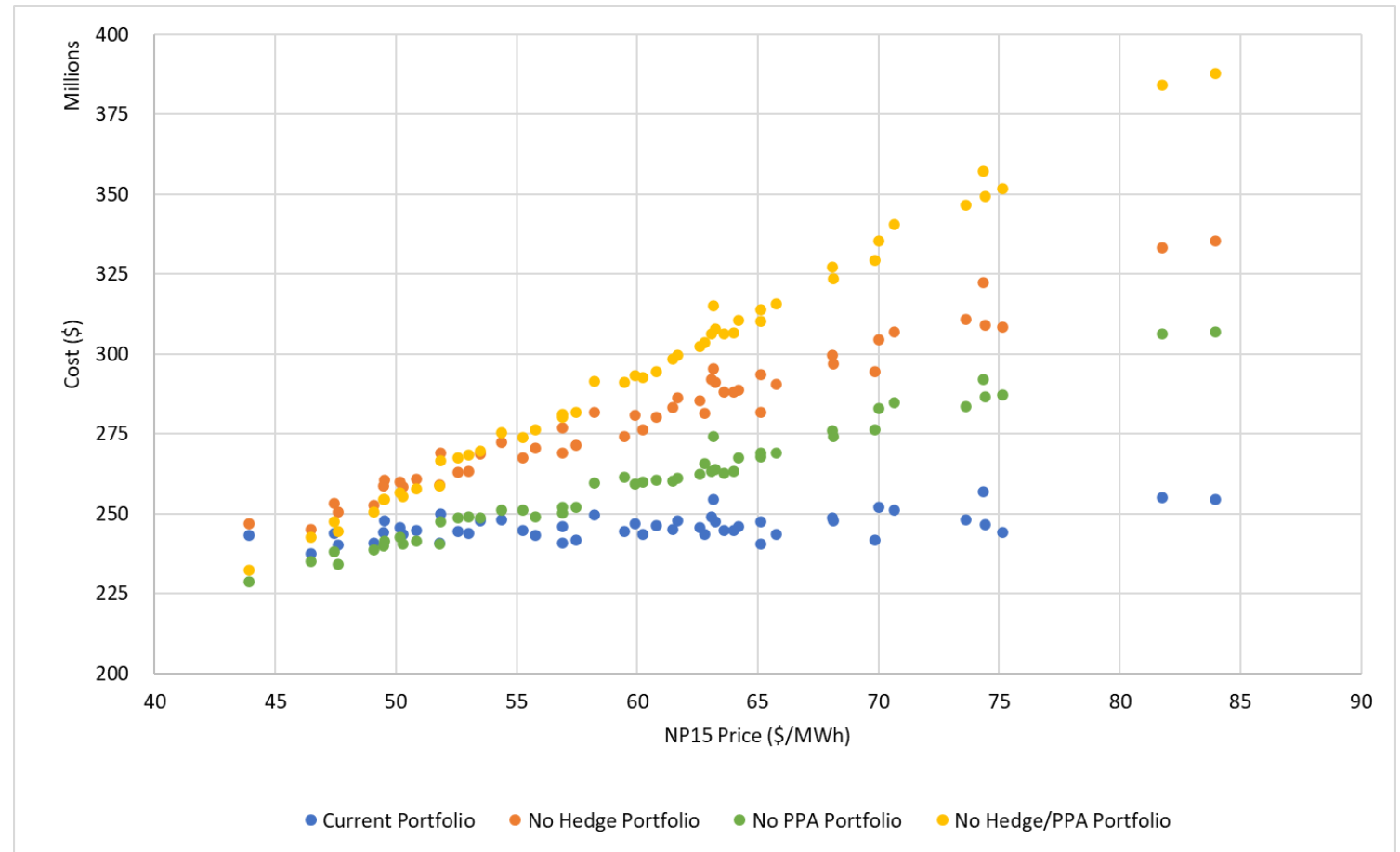


Cost of Energy, Risk of Exposure to Market (FY 2023)

- If we didn't have any hedge or PPA contracts (yellow dots), our cost of energy would increase significantly as market prices increase

Portfolio	At price of \$60/MWh	At price of \$70/MWh
Current Portfolio	\$244 million	\$252 million
No Hedge Portfolio	\$276 million	\$305 million
No PPA Portfolio*	\$260 million	\$283 million
No Hedge/PPA Portfolio*	\$293 million	\$335 million

* Not considering impacts on RA/REC costs
Peninsula Clean Energy

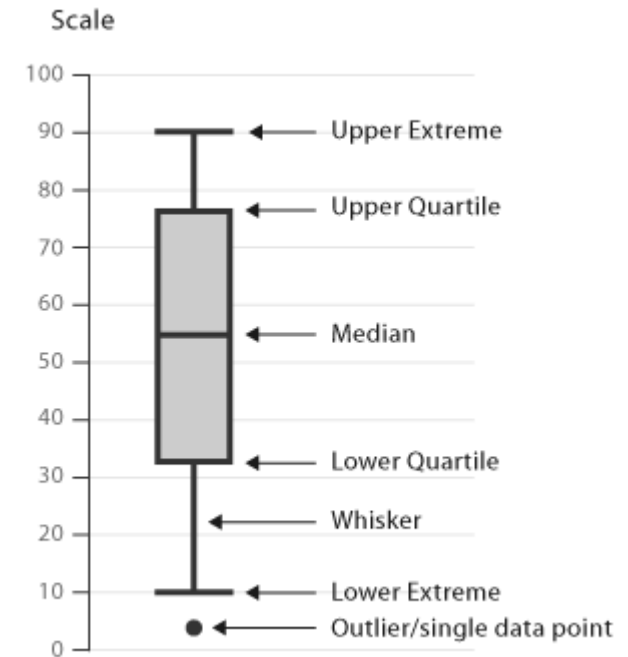


Box-Whisker Plot

- A box-whisker plot can show a range of values
 - The box shows the values between 25th and 75th percentiles
 - Any value lower than $Q1 - (1.5 \times IQR)$ or greater than $Q3 + (1.5 \times IQR)$ are considered outliers (values above upper extreme or below the lower extreme)

* IQR: Interquartile Range = $Q3 - Q1$

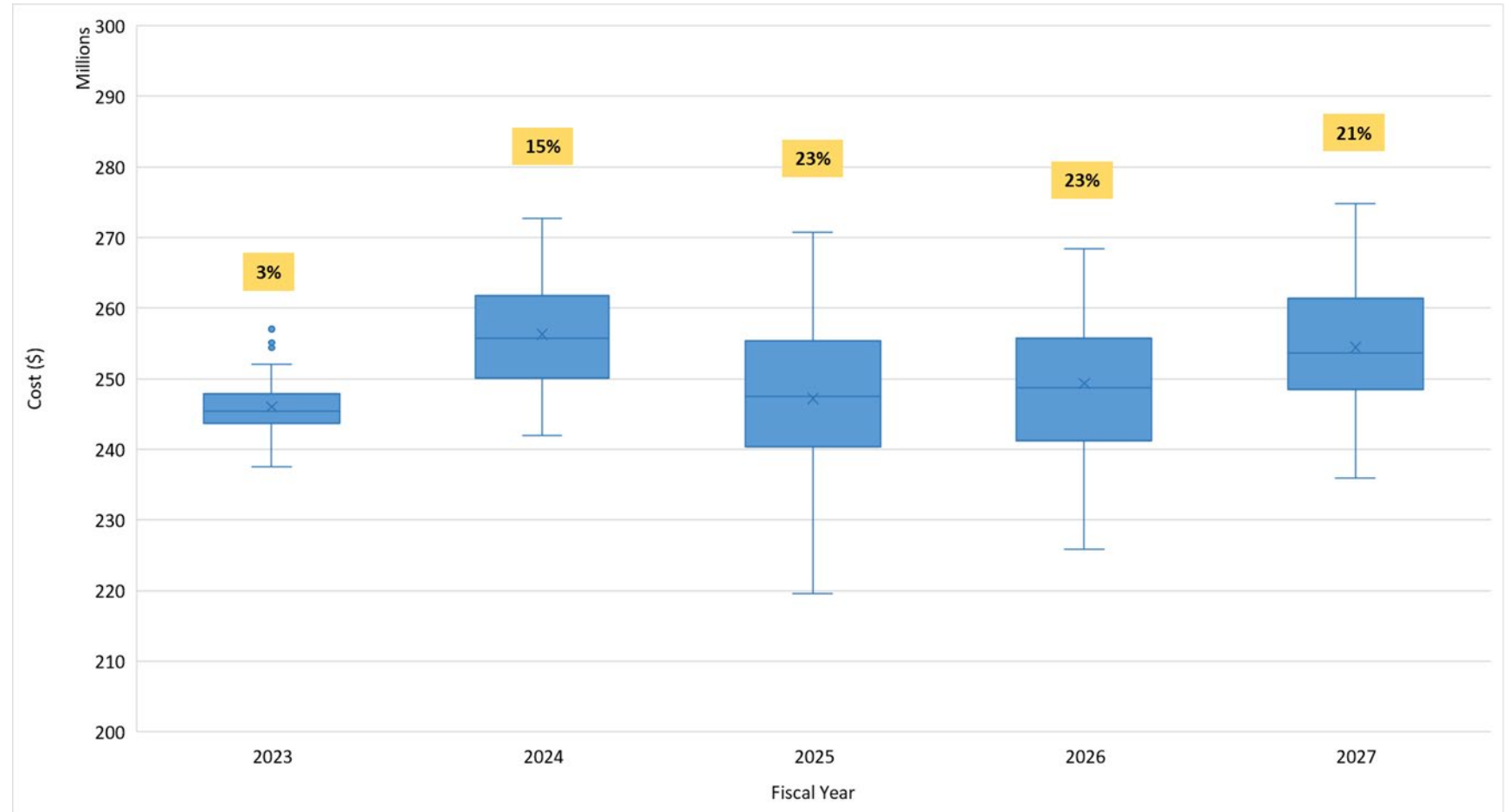
Q3: 75th percentile, Q1: 25th percentile



Cost of Energy

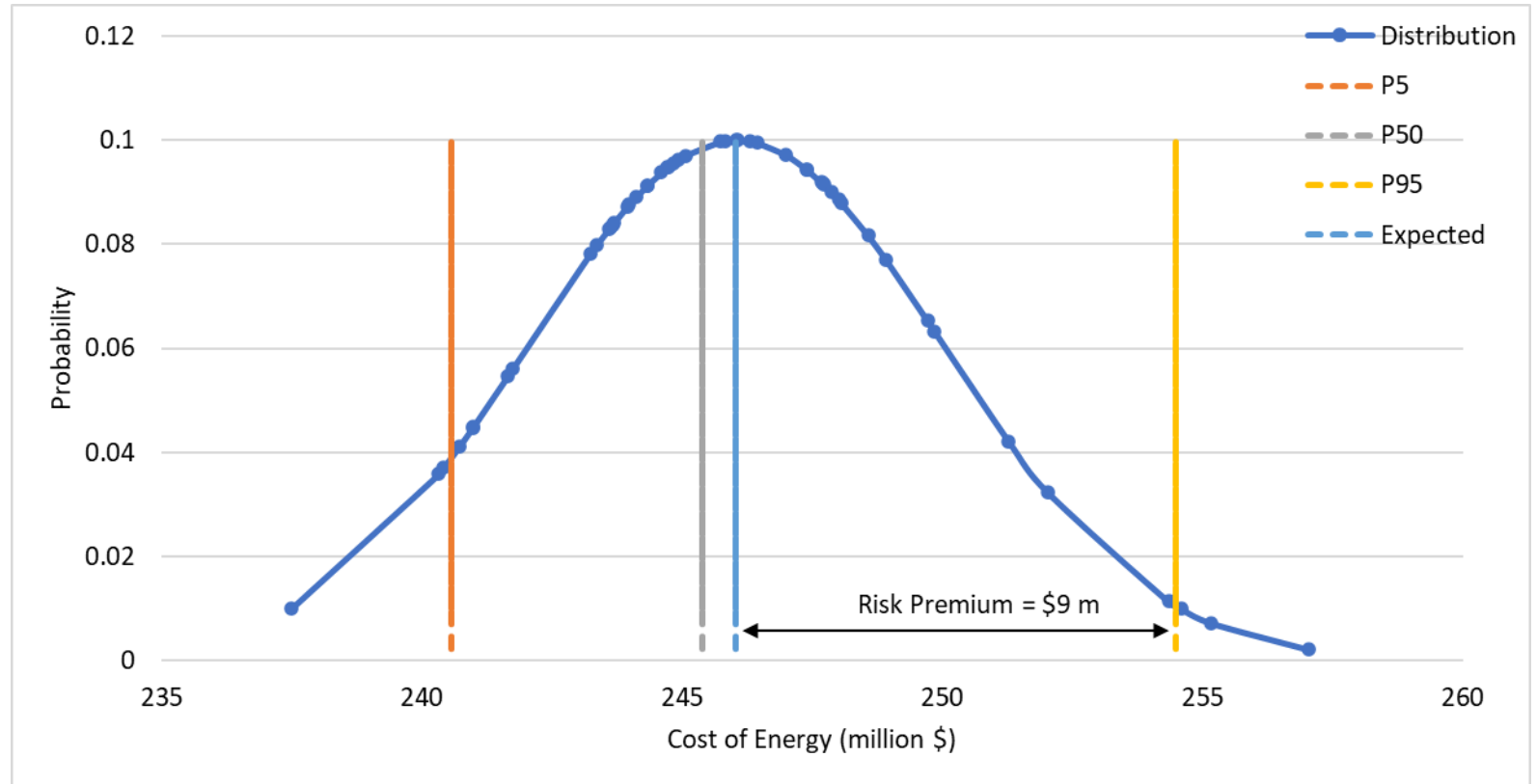
- Over time, range of likely outcomes becomes larger as we have a larger open position

* Yellow boxes show open position for each FY



Cost of Energy: Range of likely Outcomes (FY 2023)

- P95: \$254 million
- P50: \$245 million
- Risk Premium: \$9 million

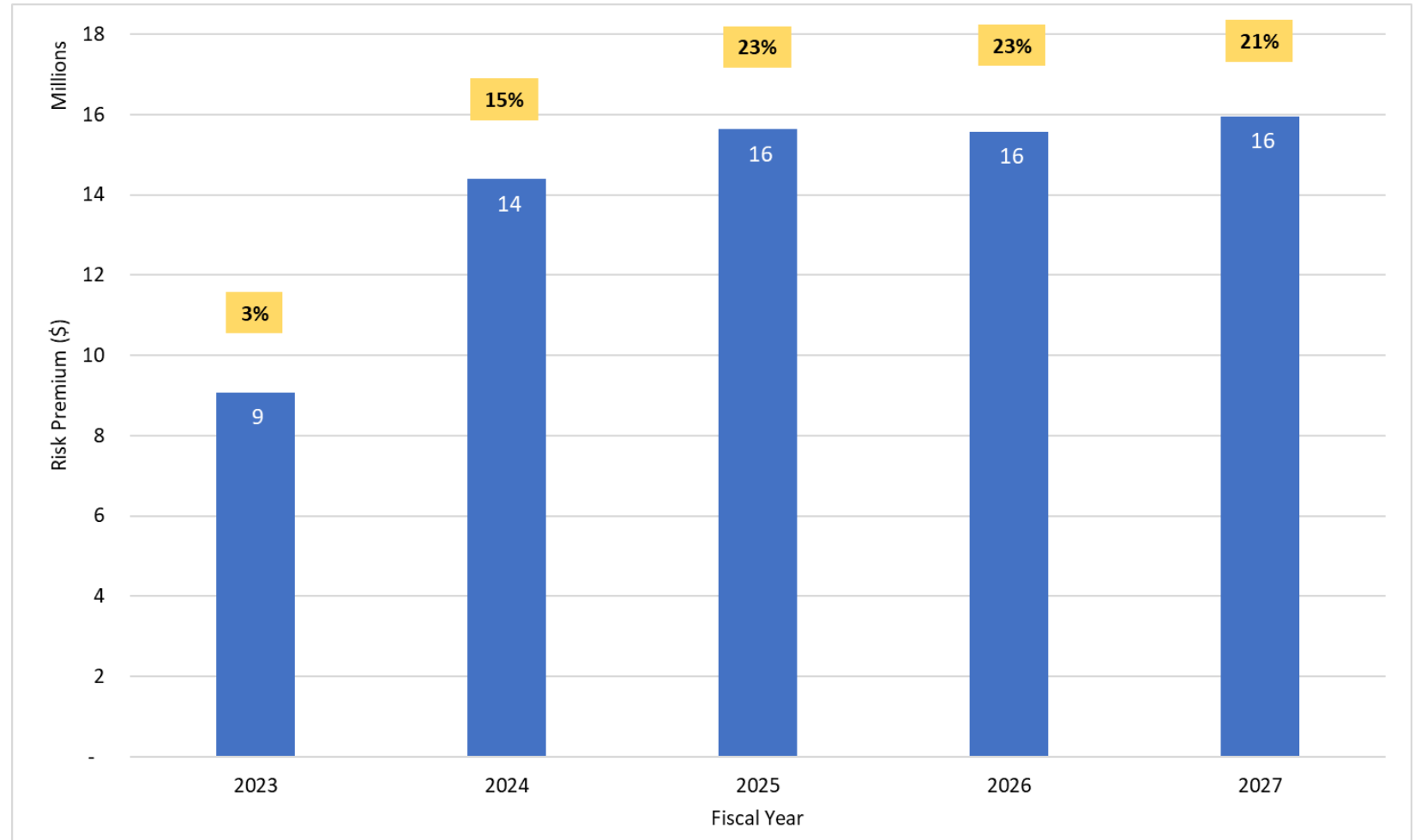


Risk Premium

- Over time, risk premium increases as our open position becomes larger

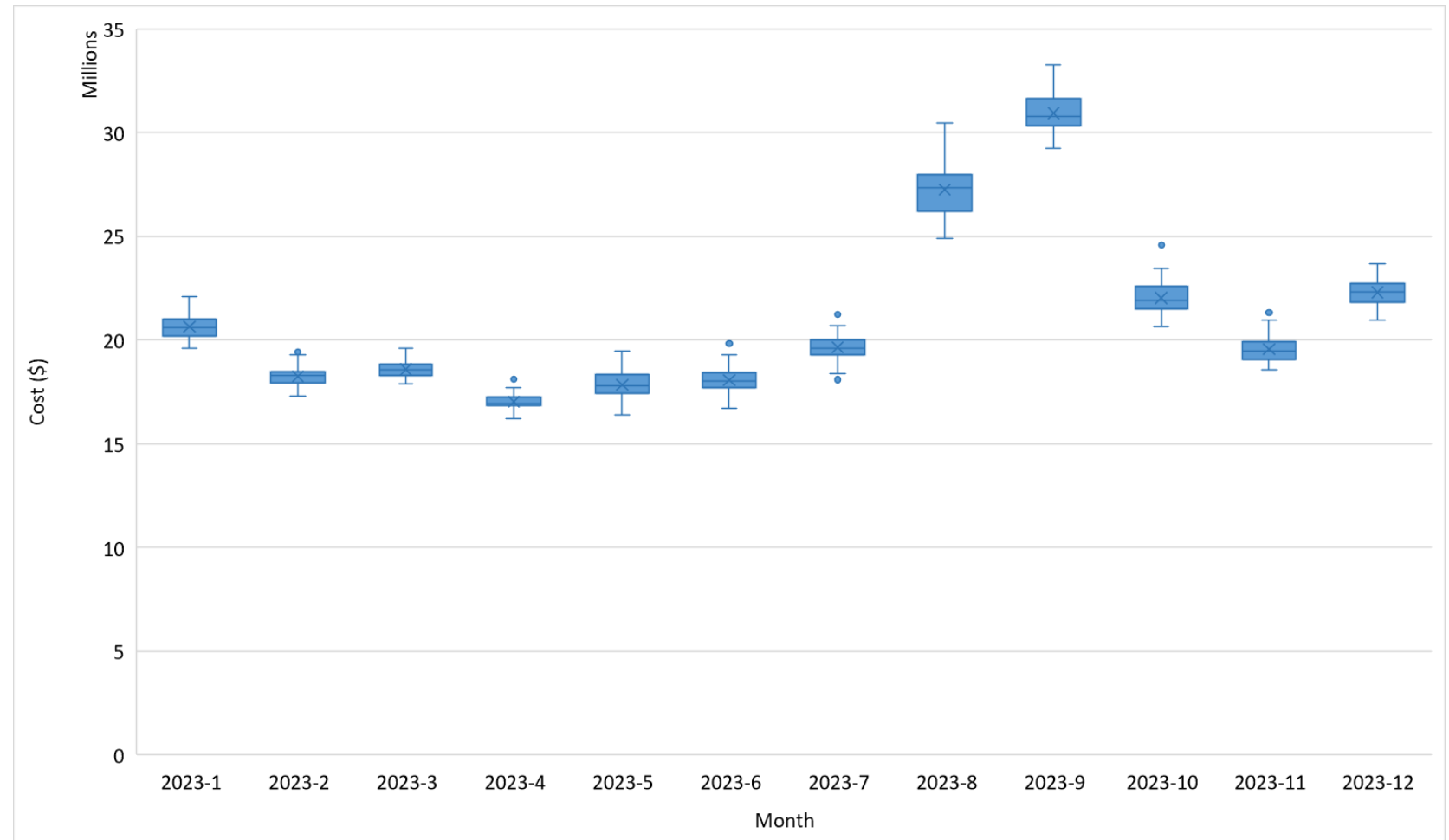
*Risk premium is defined as the difference between p95 of simulations and p50 of simulations

* Yellow boxes show open position for each FY

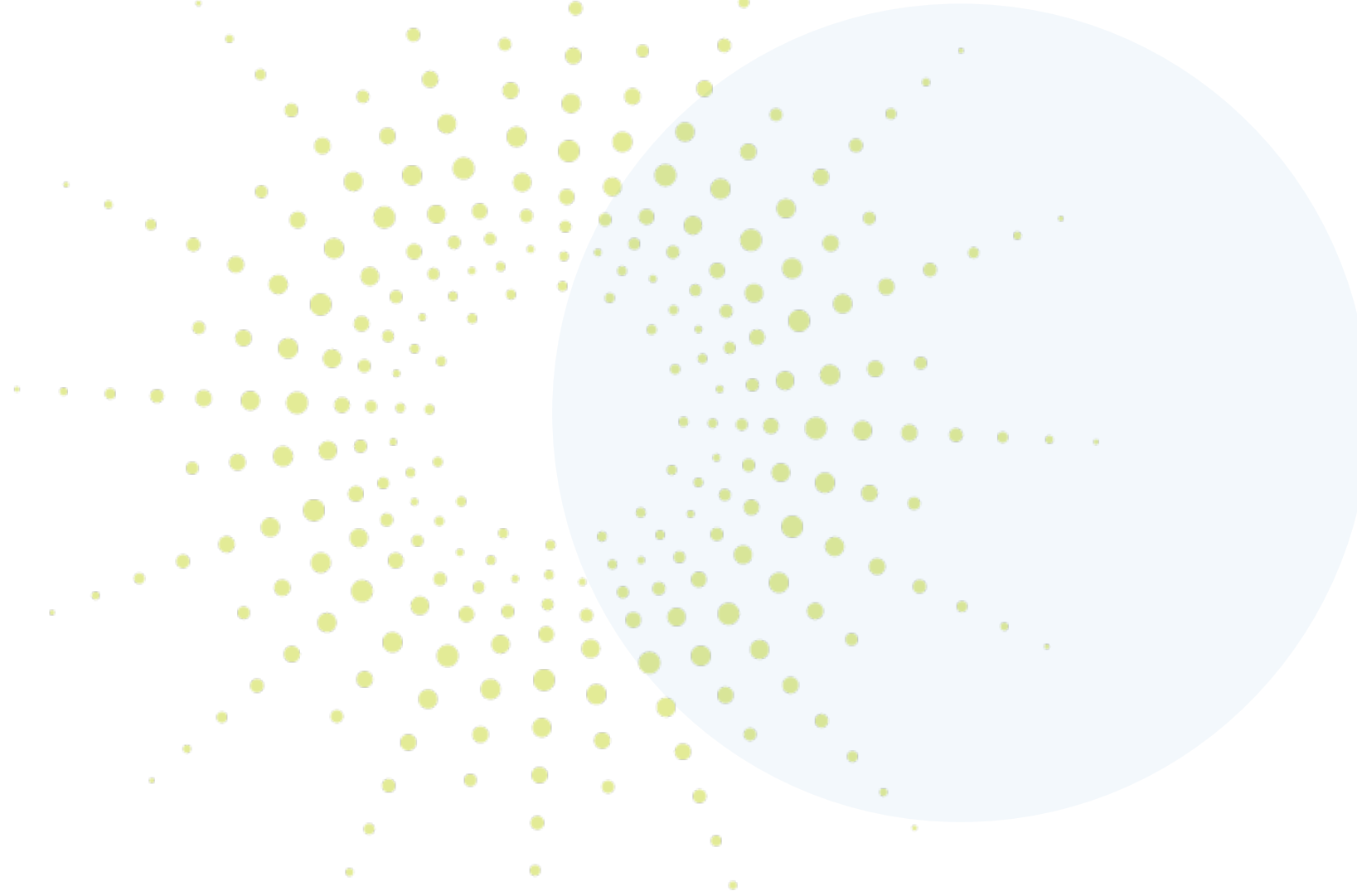


Monthly Cost of Energy

- Cost of energy varies month-to-month
- More uncertainty around cost of energy in Summer and Winter months due to higher volatility in load and prices
- Cost of energy in Spring has very low uncertainty

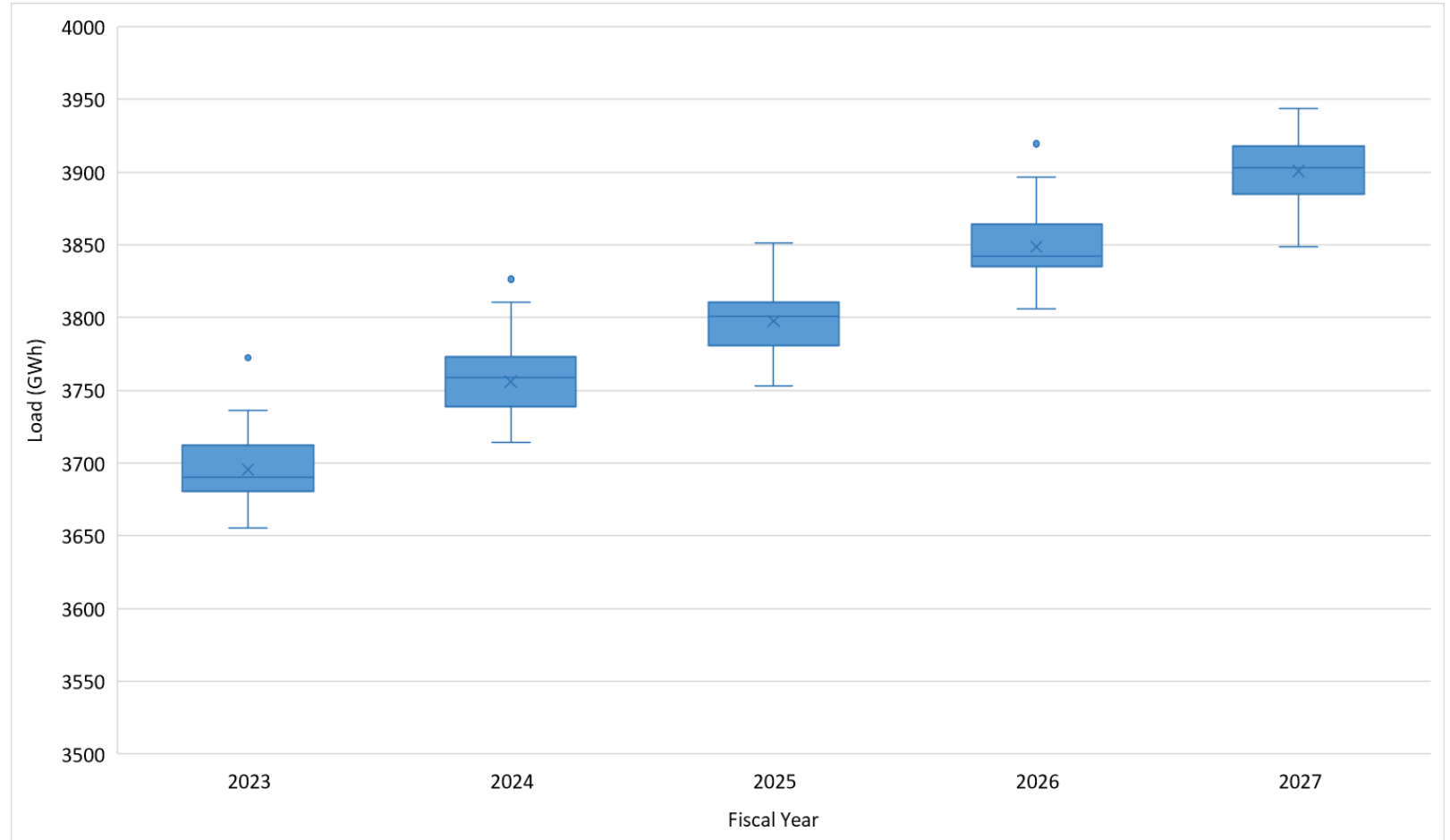


Load



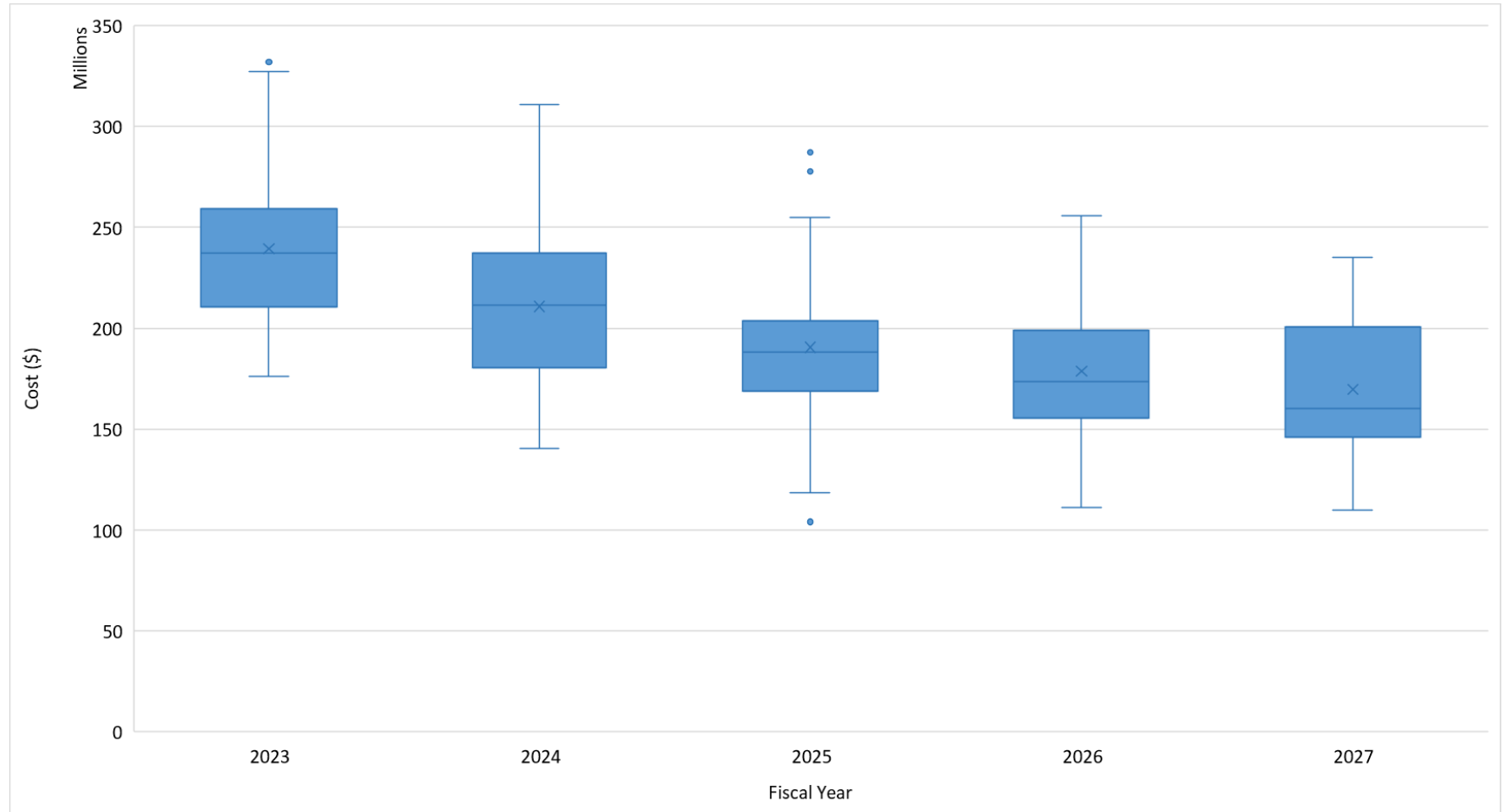
Load Simulation

- PowerSimm is capable to simulate a range of likely outcomes for our load
- In FY 2023, load could vary between 3,655 and 3,772 GWh



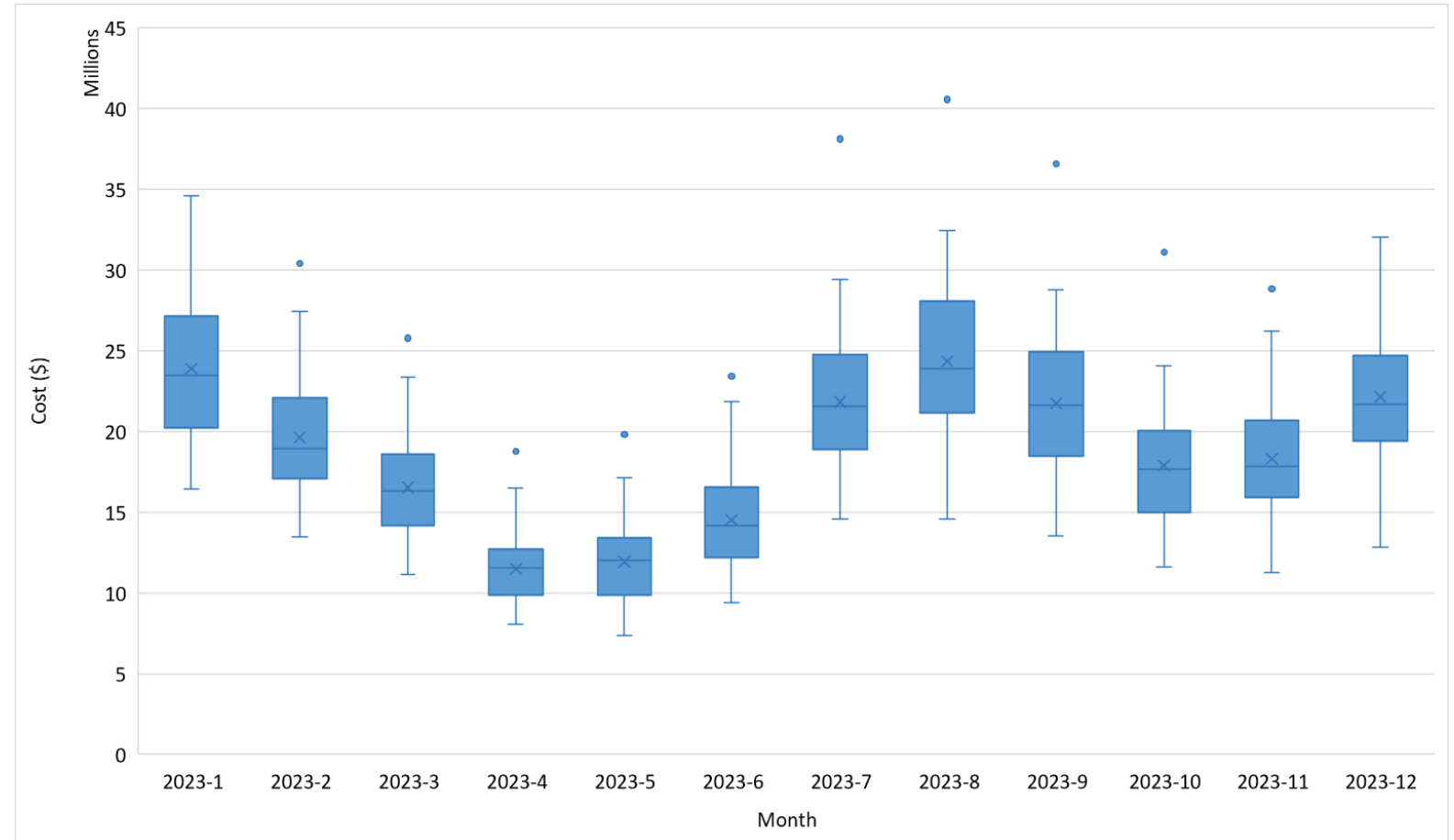
Load Cost

- Expected MWh of load * Expected price at DLAP
- Load cost decreasing over time due to expected lower prices
- Cost of Energy includes load cost as well as the cost of hedges and contracts to manage load cost

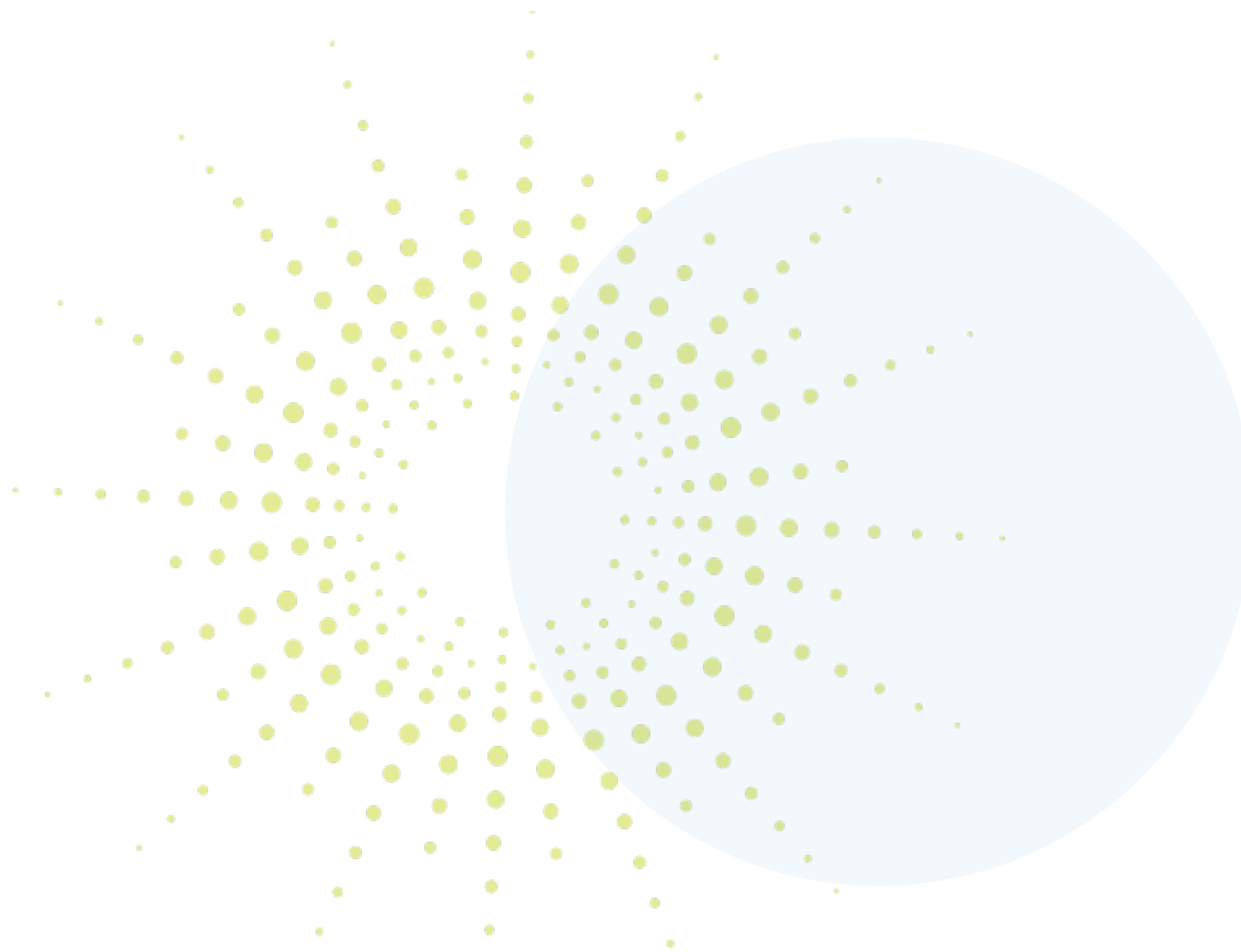


Load Cost, Monthly

- Larger uncertainty around load costs in Summer months due to possibility of heatwaves

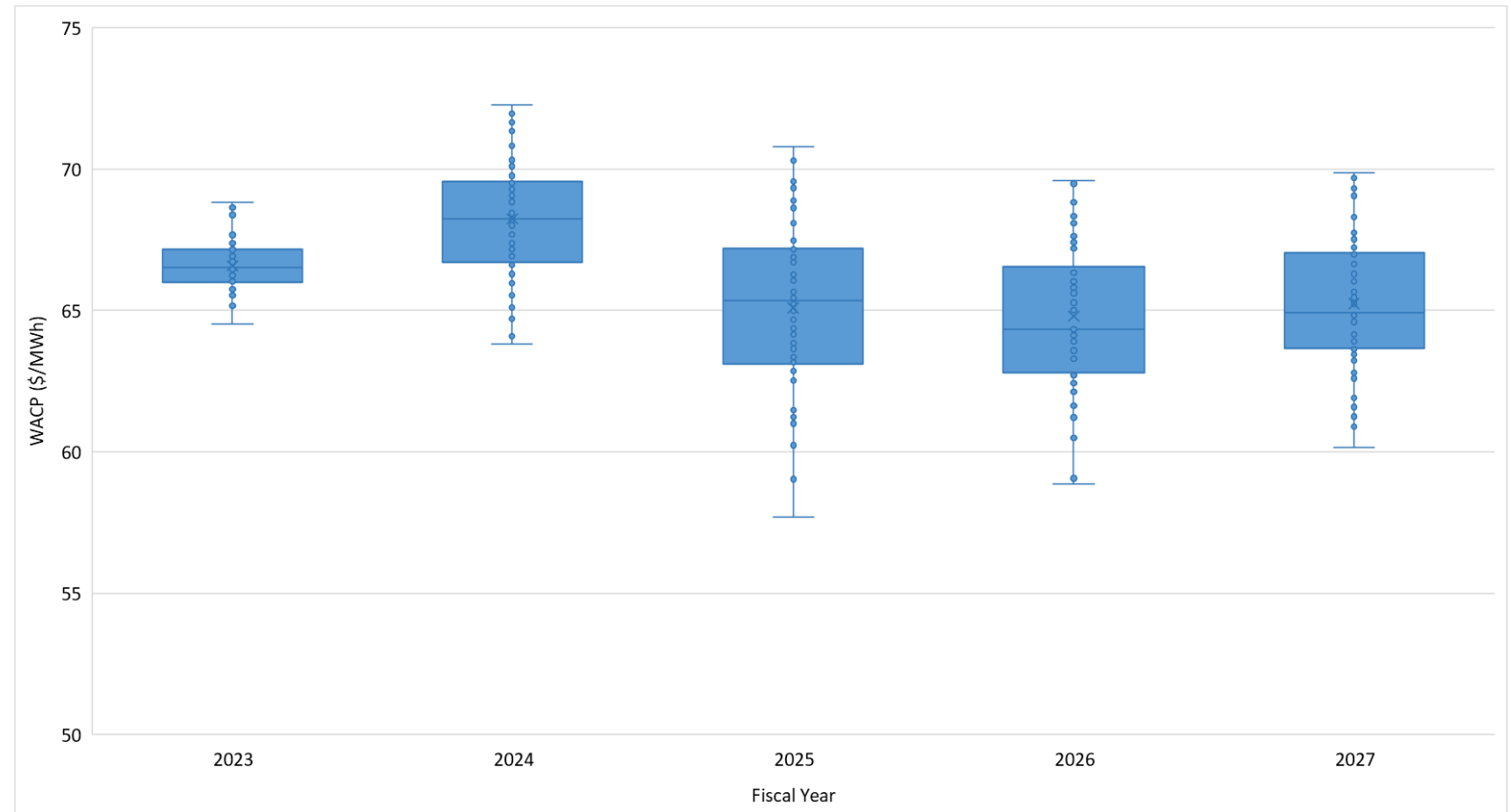


Appendix



WACP, Range of Likely Outcomes

- Over time, range of likely outcomes becomes larger as we have a larger open position

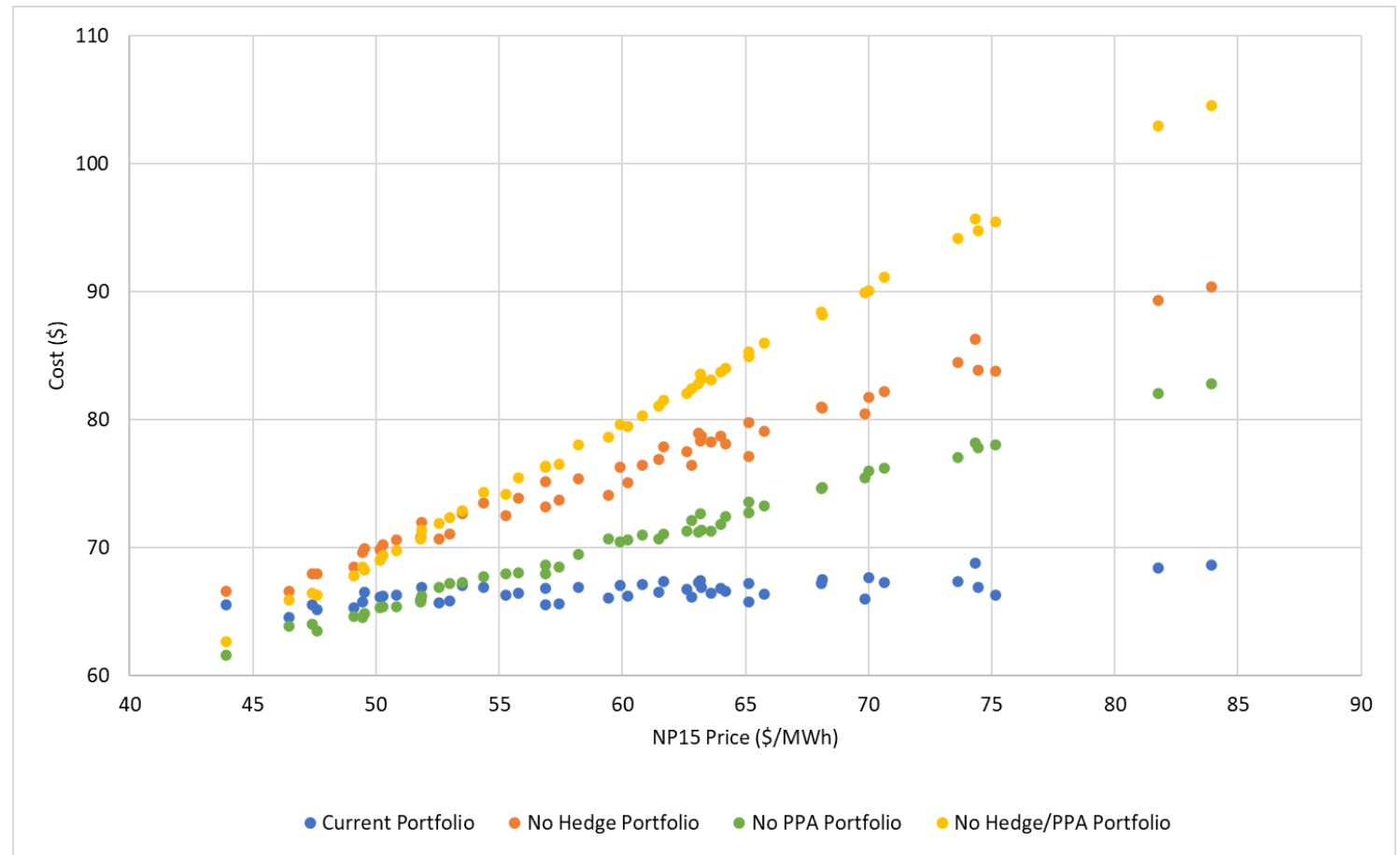


WACP, Risk of Exposure to Market (FY 2023)

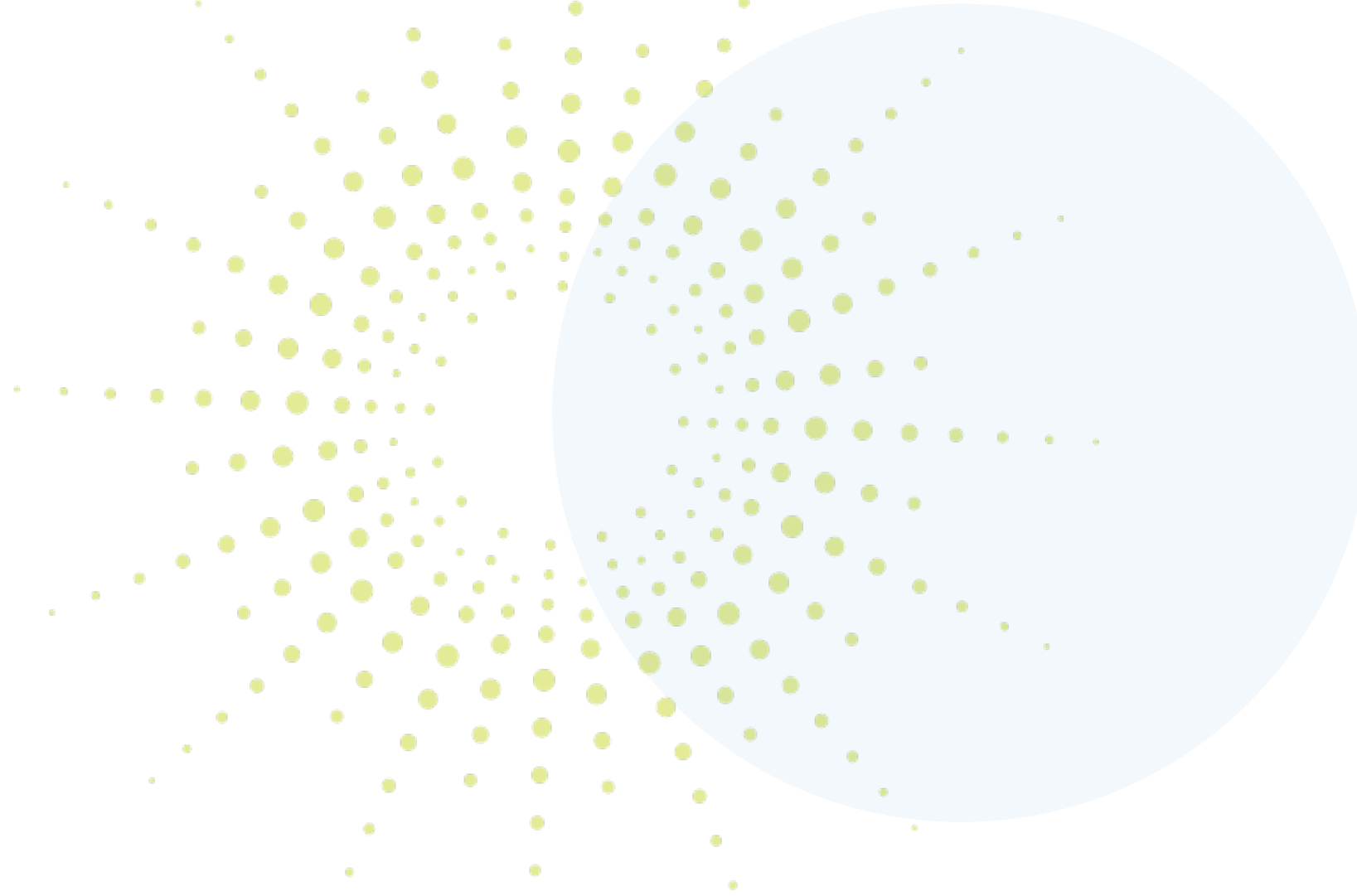
- If we didn't have any hedge or PPA contract (yellow dots), our cost of energy could have significantly increased with higher market prices

Portfolio	At price of \$60/MWh	At price of \$70/MWh
Current Portfolio	\$66.2/MWh	\$67.7/MWh
No Hedge Portfolio	\$75.1/MWh	\$81.8/MWh
No PPA Portfolio*	\$70.6/MWh	\$76.0/MWh
No Hedge/PPA Portfolio*	\$79.50/MWh	\$90.1/MWh

* Not considering impacts on RA/REC costs

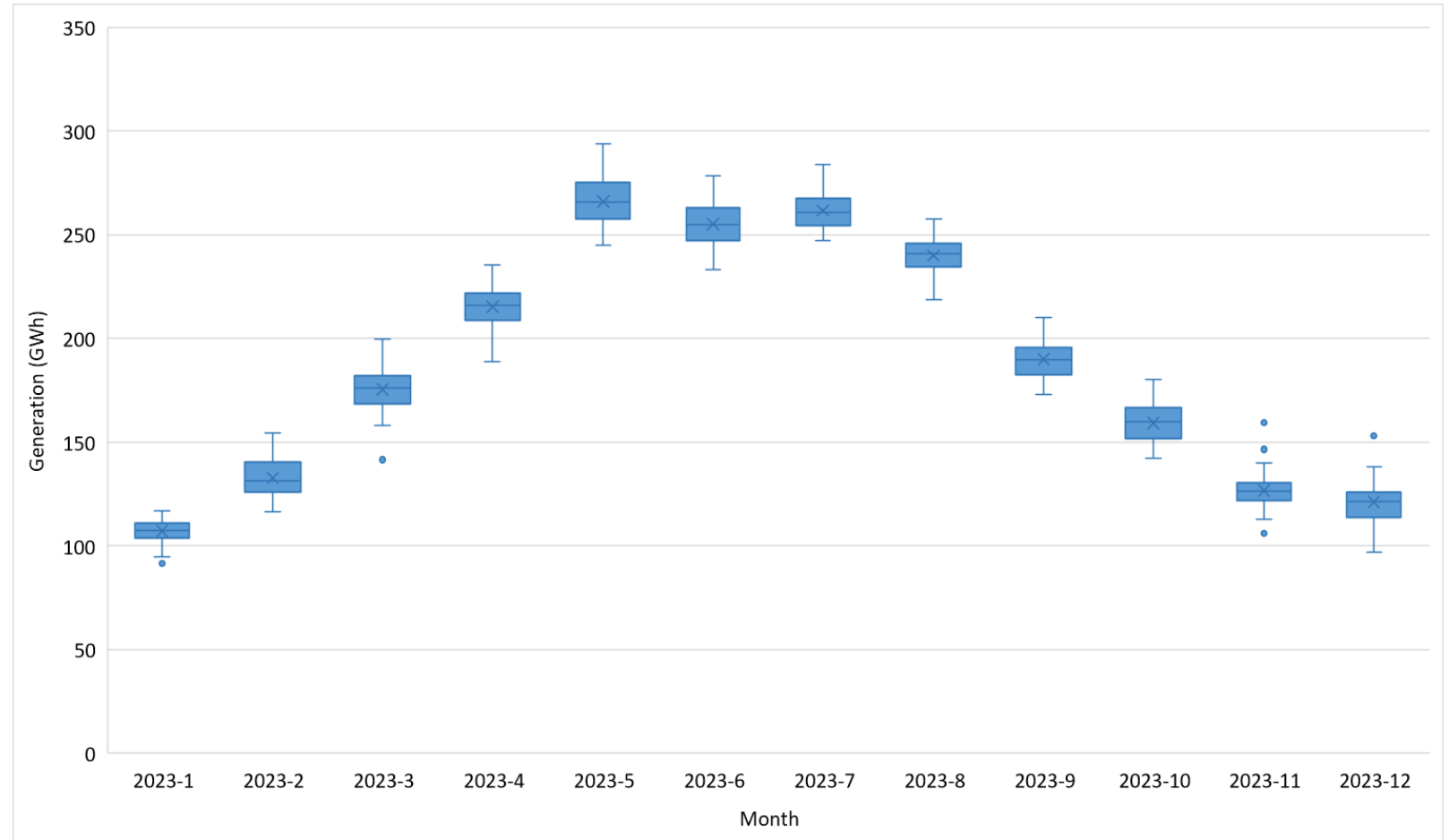
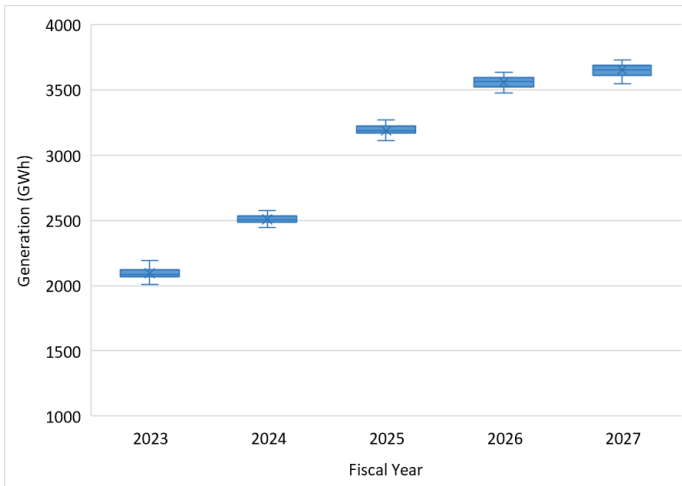


PPAs



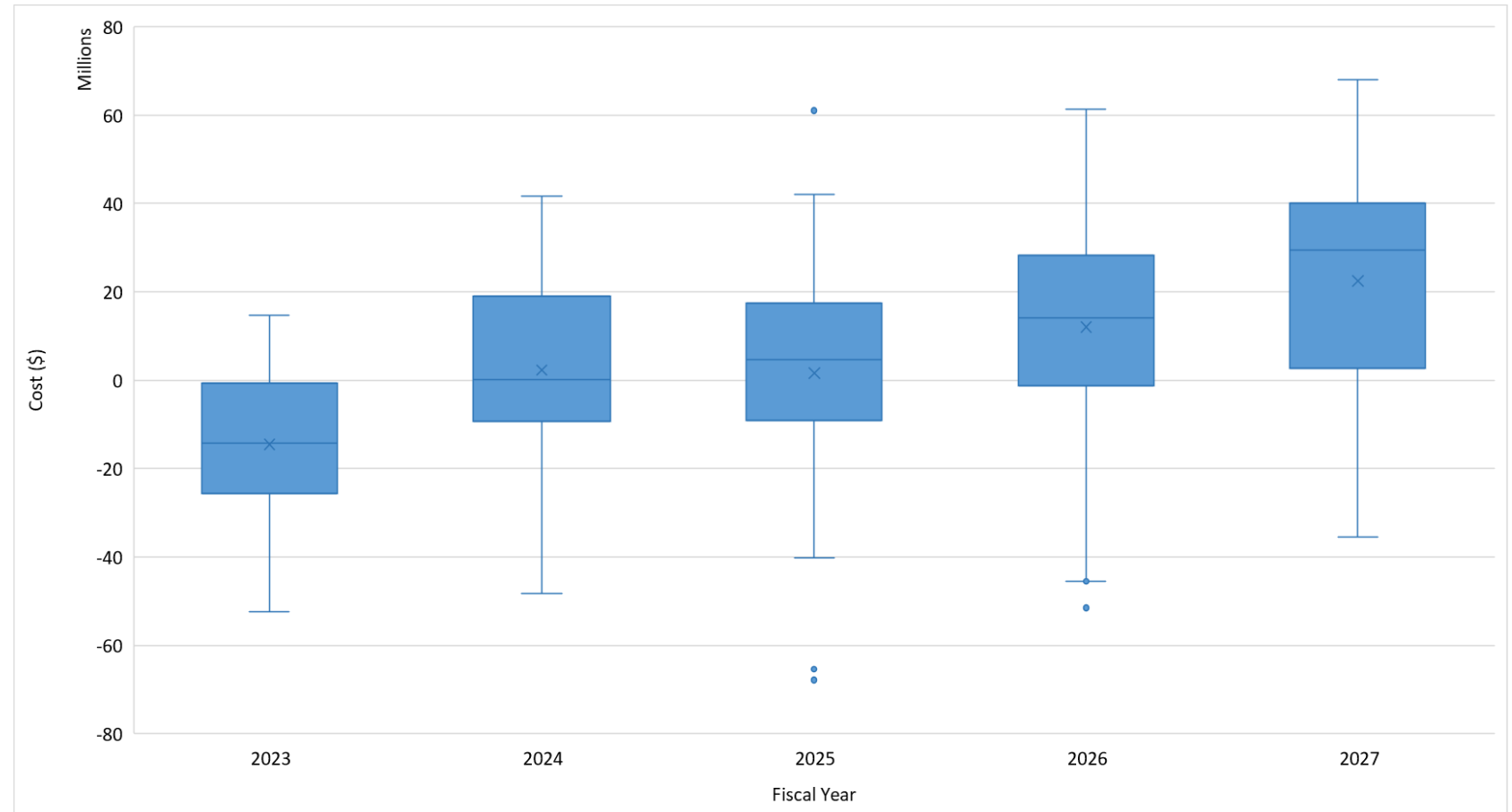
PPA MWh

- PowerSimm will simulate the uncertainty around renewable generation



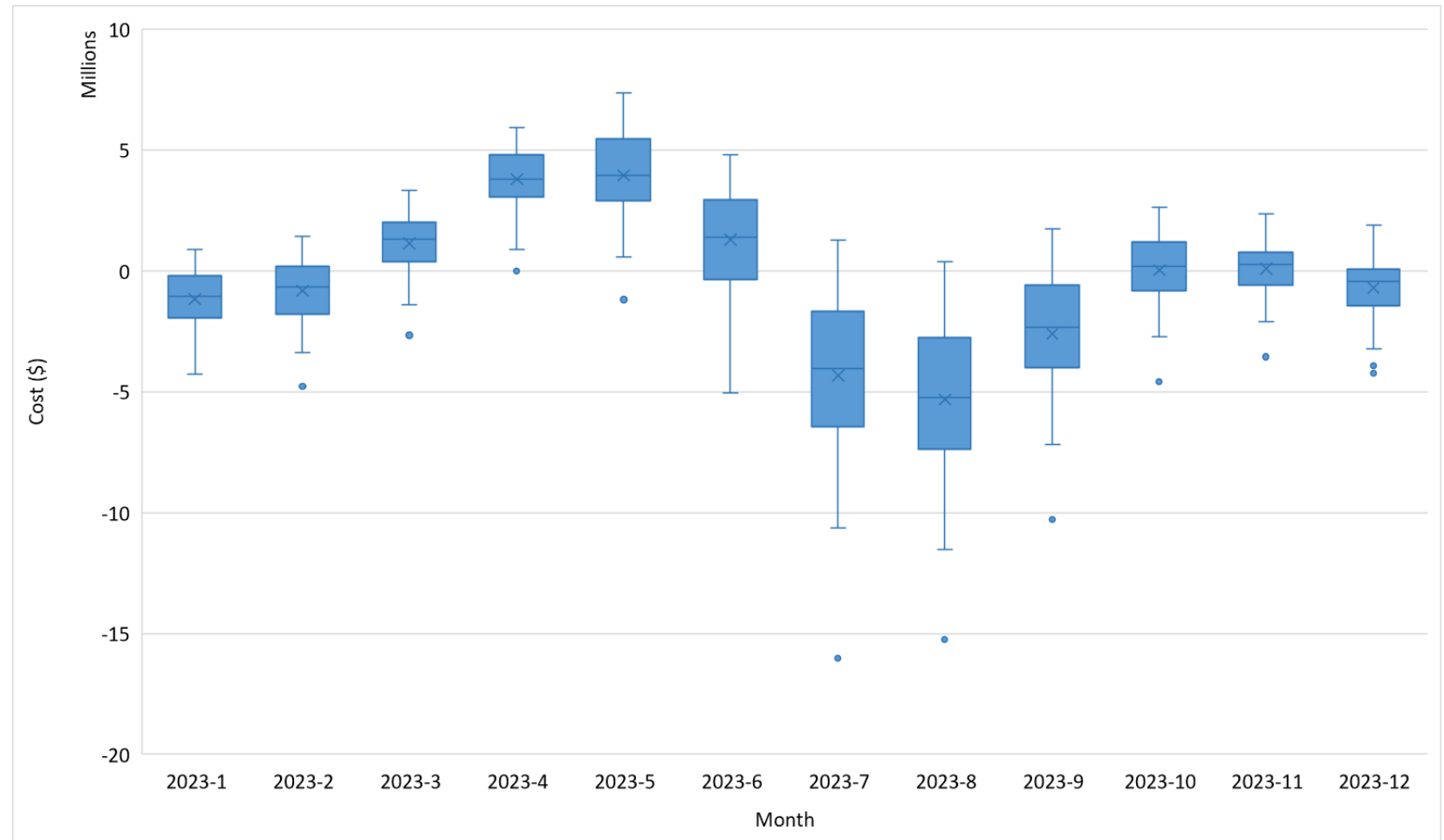
Net PPA Cost

- Net PPA Cost (PPA Cost – PPA revenue) could vary significantly based on market prices

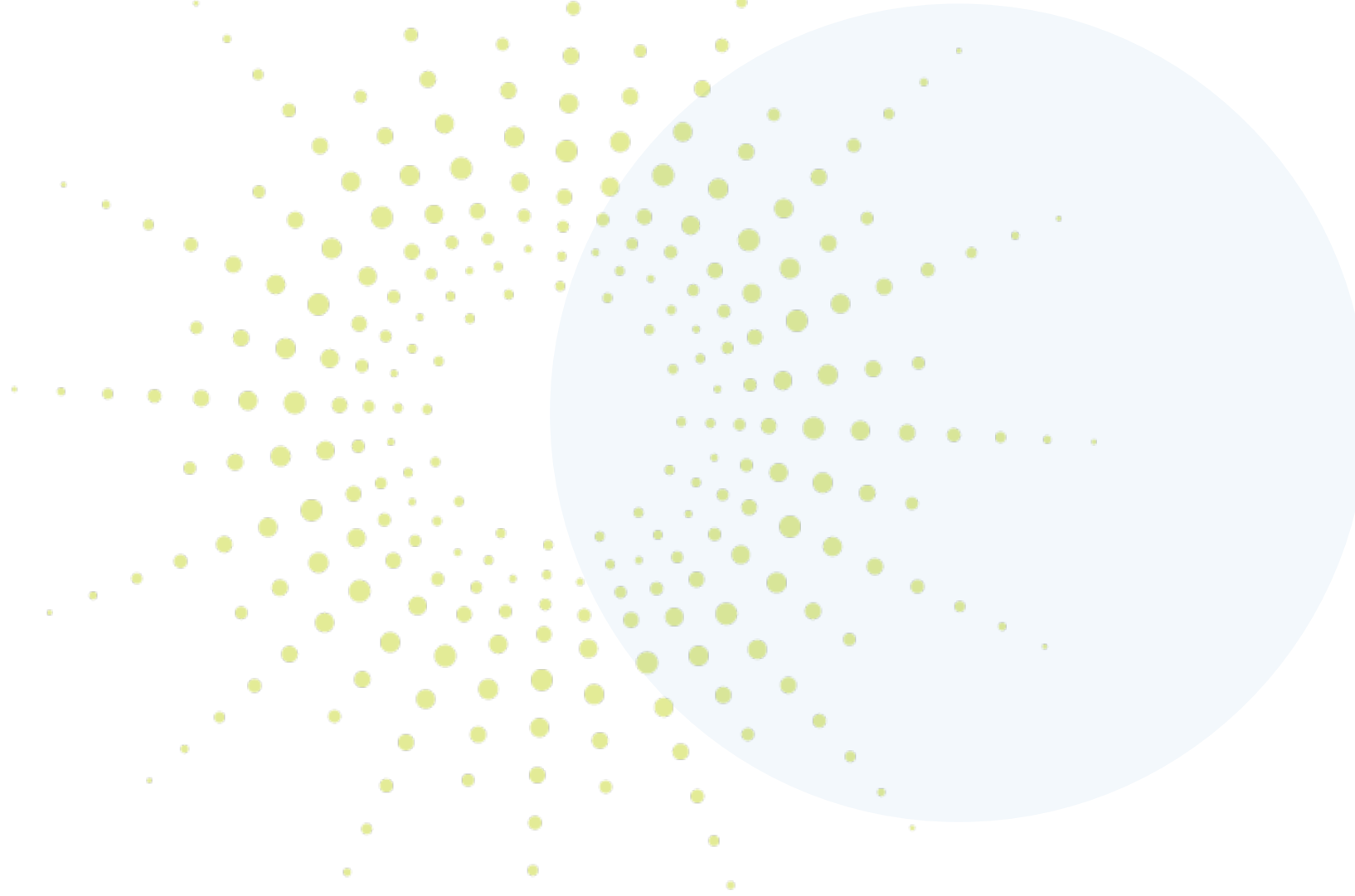


Net PPA Cost, Monthly

- Net PPA Cost (PPA Cost – PPA revenue) has much larger uncertainties in summer months

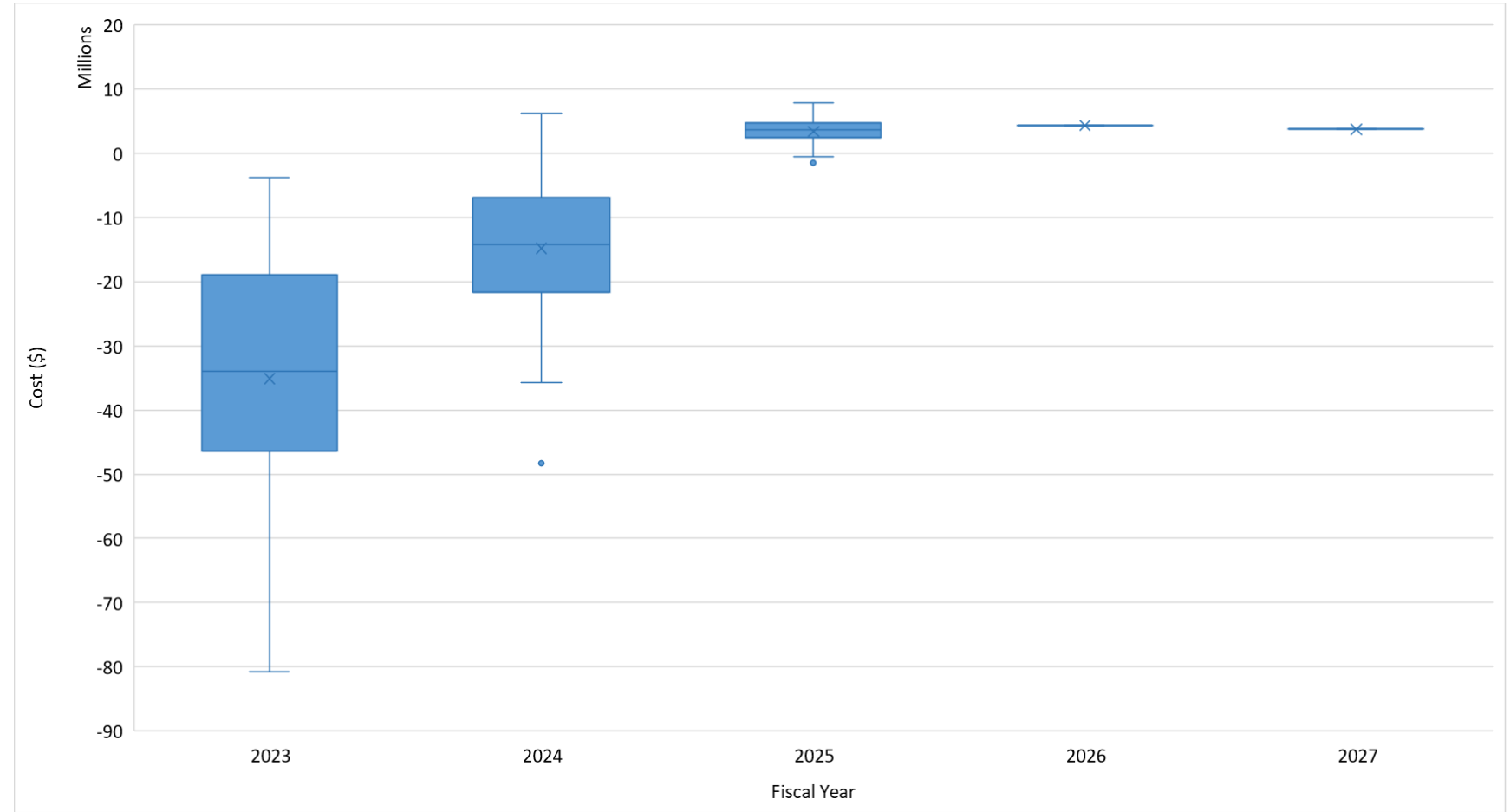


Hedges



Net Hedge Cost

- Net Hedge Cost (Hedge Cost – Hedge revenue) could vary significantly based on market prices



Net Hedge Cost, Monthly

- Net Hedge Cost (Hedge Cost – Hedge revenue) has much larger uncertainties in winter months due to larger volumes of hedges in these months

