Resource Generation Plan Update

EUC Working Group Portfolios

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EUC Working Group Portfolios

Production Cost Modeling Key Results

S. Babu Chakka

Manager, Energy Market Analysis & Resource Planning

Portfolio A_2035 (Meet Load with Clean Energy, DR, EE & Batteries)

EE	DR	Renewable Goals	Local Solar	Batteries	Convention Gen
5% Summer Peak Reduction by 2027	150 MW by 2027	65% by 2027	500 MW with 200 MW behind the meter by 2030	4 Hr: 100 MW Local +25 MW Nonlocal Co-located by 2027 200 MW = 100 MW Local + 100 MW Nonlocal Co-located by 2035	FPP retire in 2030
10% Summer Peak Reduction by 2030	500 MW by 2035	70% by 2030	700 MW with 250 MW behind the meter by 2035	8 Hr: 100 MW Local +50 MW Nonlocal Co-located by 2027 200 MW = 100 MW Local + 100 MW Nonlocal Co-located by 2035	Natural Gas Plants retire in 2035
14% Summer Peak Reduction by 2035		80% by 2035		100 Hr: 10 MW Local by 2027 50 MW Local by 2030 100 MW Local by 2035	No Change to STP

Note:

- Energy Efficiency assumed existing programs and scaled to get the required the summer peak reduction
- 8 Hour Batteries were assumed for 4 to 12 Hour range
- 100 Hour Batteries were assumed instead of 72 Hour duration
- The technologies and the quantities of the options were modeled as per the request, but the feasibility and potential of these programs require detailed market research and market study.
- Decker GTs were retired in 2027 in Austin Energy portfolios where in these portfolios they are retired as per NG plants retirement timeline

Portfolio A_2030 (Meet Load with Clean Energy, DR, EE & Batteries)

EE	DR	Renewable Goals	Local Solar	Batteries	Convention Gen
5% Summer Peak Reduction by 2027	150 MW by 2027	65% by 2027	350 MW with 150 MW behind the meter by 2027	4 Hr: 100 MW Local +25 MW Nonlocal Co-located by 2027 200 MW = 100 MW Local + 100 MW Nonlocal Co-located by 2030	FPP retire in 2030
10% Summer Peak Reduction by 2030	500 MW by 2030	80% by 2030	500 MW with 200 MW behind the meter by 2030	8 Hr: 100 MW Local +50 MW Nonlocal Co-located by 2027 200 MW = 100 MW Local + 100 MW Nonlocal Co-located by 2030	Natural Gas Plants retire in 2030
14% Summer Peak Reduction by 2035			700 MW with 250 MW behind the meter by 2035	100 Hr: 10 MW Local by 2027 100 MW Local by 2030	No Change to STP

Note:

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Portfolio B_2035 (Meet Load with more storage, moderate DR/EE and moderate renewables)

EE	DR	Renewable Goals	Local Solar	Batteries	Convention Gen
3% Summer Peak Reduction by 2027	100 MW by 2027	65% by 2027	475 MW with 200 MW behind the meter by 2030	4 Hr: 150 MW with 75 MW Local by 2027 300 MW with 150 MW Local + 25 MW Nonlocal Co-located by 2035	FPP retire in 2030
8% Summer Peak Reduction by 2035	200 MW by 2030	Add 200 MW after 2027	575 MW with 250 MW behind the meter by 2035	8 Hr: 50 MW by 2027 100 MW with 25 MW Nonlocal Co-located by 2035	Natural Gas Plants retire in 2035
	300 MW by 2035			100 Hr: 100 MW Local by 2027 200 MW Local by 2035	No Change to STP

Note:

- Energy Efficiency assumed existing programs and scaled to get the required the summer peak reduction
- 8 Hour Batteries were assumed for 4 to 12 Hour range
- 100 Hour Batteries were assumed instead of 72 Hour duration
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Annual Additions

Wind Addition in MW

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Portfolio A_2035	0	0	0	50	50	50	200	200	150	150	100	950
Portfolio A_2030	0	0	0	300	150	200	50	50	50	50	100	950
Portfolio B_2035	0	0	0	100	0	100	0	0	0	0	0	200
Portfolio B_2030	0	0	0	100	0	100	0	0	0	0	0	200

Battery Addition in MW (4 Hour duration)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Portfolio A_2035	60	35	30	5	10	10	10	10	10	10	10	200
Portfolio A_2030	60	35	30	15	40	20	0	0	0	0	0	200
Portfolio B_2035	50	50	50	45	20	15	15	15	15	15	10	300
Portfolio B_2030	80	35	35	70	40	40	0	0	0	0	0	300

Battery Addition in MW (8 Hour duration)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Portfolio A_2035	70	45	35	10	10	10	10	10	0	0	0	200
Portfolio A_2030	70	45	35	10	20	20	0	0	0	0	0	200
Portfolio B_2035	10	20	20	30	5	5	5	5	0	0	0	100
Portfolio B_2030	30	10	10	35	10	5	0	0	0	0	0	100

Battery Addition in MW (100 Hour duration)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Portfolio A_2035	4	4	2	10	10	20	10	10	10	10	10	100
Portfolio A_2030	4	4	2	30	30	30	0	0	0	0	0	100
Portfolio B_2035	50	25	25	20	20	10	10	10	10	10	10	200
Portfolio B_2030	50	25	25	50	25	25	0	0	0	0	0	200

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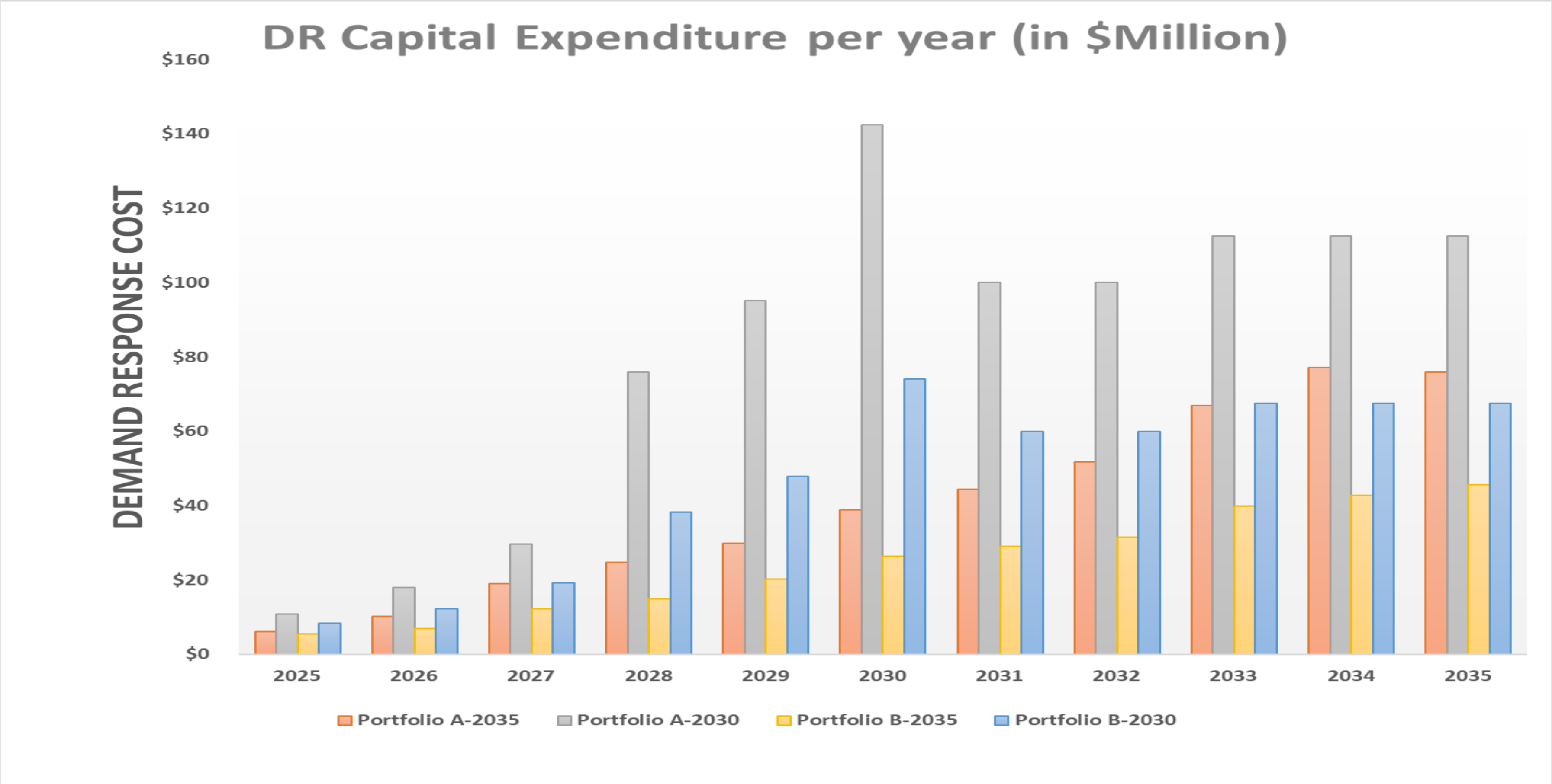
**Utility Scale Solar is included in the base case to achieve 65% renewable target*

Key Assumptions

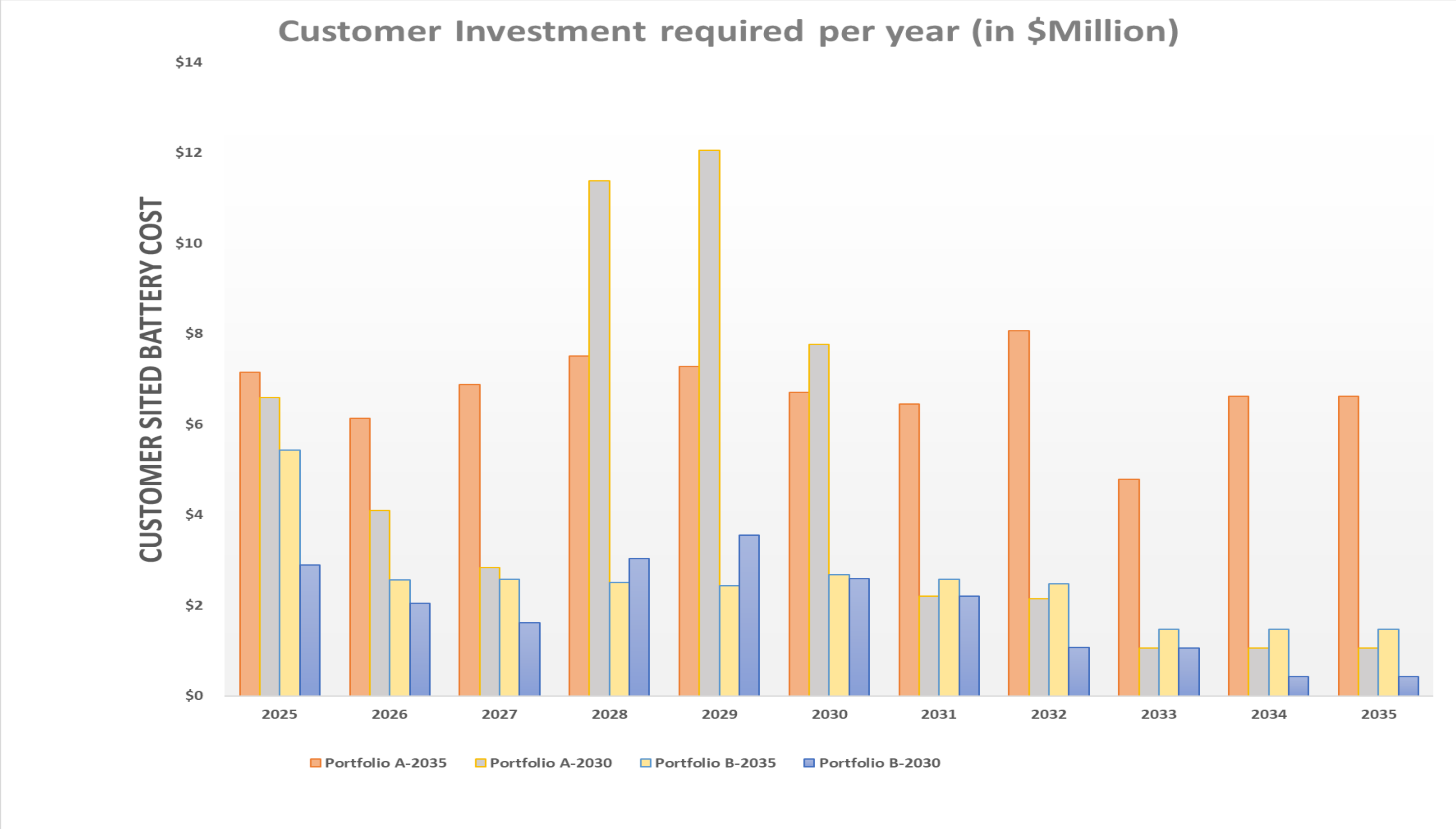
Demand Response (in $ millions)



DR	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Portfolio A-2035	$6	$10	$19	$25	$30	$39	$44	$52	$67	$77	$76	$445
Portfolio A-2030	$11	$18	$30	$76	$95	$143	$100	$100	$113	$113	$113	$910
Portfolio B-2035	$6	$7	$12	$15	$20	$26	$29	$32	$40	$43	$46	$275
Portfolio B-2030	$8	$12	$19	$38	$48	$74	$60	$60	$68	$68	$68	$523

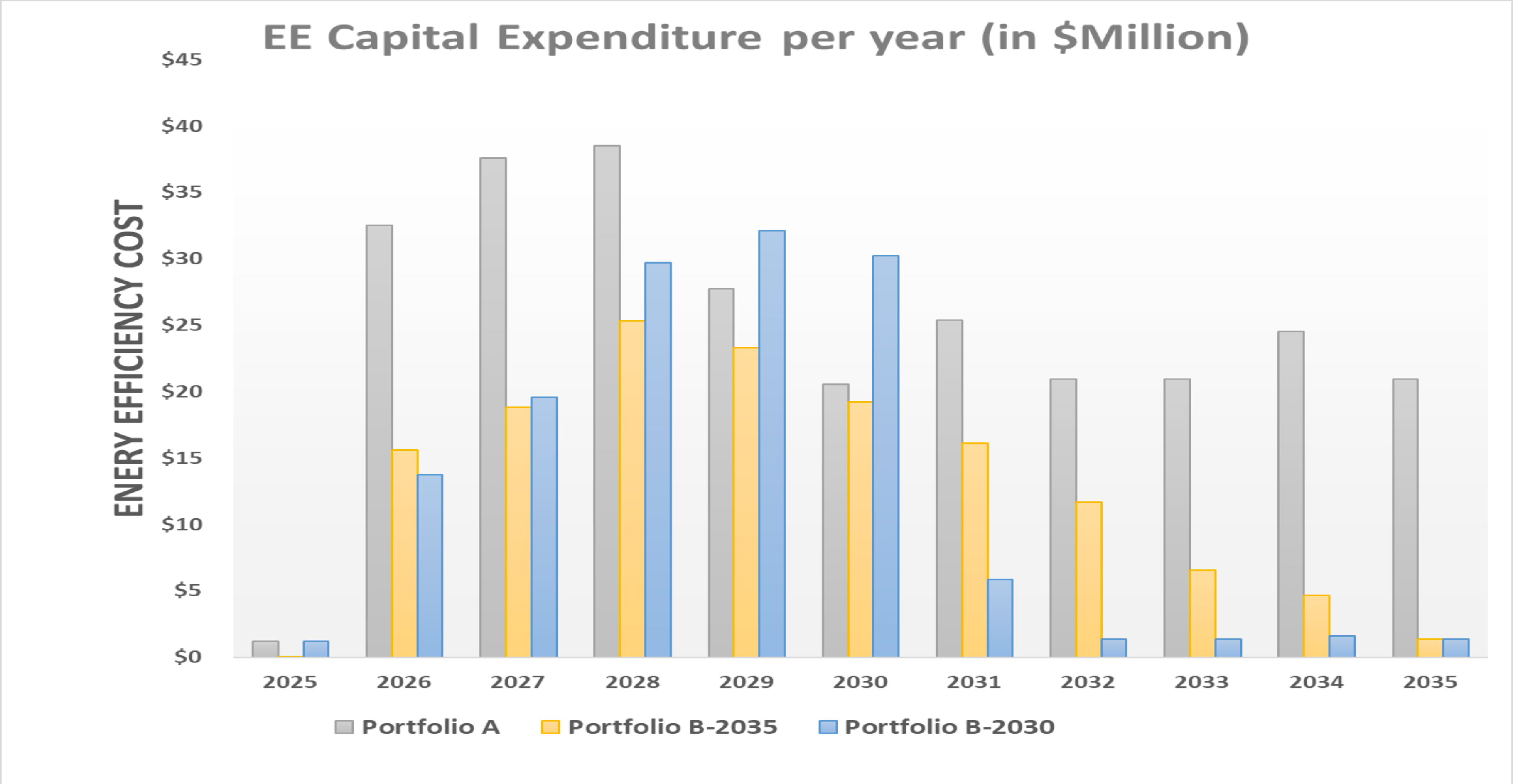
**These costs are in addition to the existing budget and will result in increase Community Benefit Charges*
500 MW of DR is comprised of 200 MW of Behavioral DR and the balance is by energy storage located at the customer site

Customer Investment Needed for DR



Customer Site Batteries	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Portfolio A-2035	$7	$6	$7	$8	$7	$7	$6	$8	$5	$7	$7	$74
Portfolio A-2030	$7	$4	$3	$11	$12	$8	$2	$2	$1	$1	$1	$52
Portfolio B-2035	$5	$3	$3	$3	$2	$3	$3	$2	$1	$1	$1	$28
Portfolio B-2030	$3	$2	$2	$3	$4	$3	$2	$1	$1	$0	$0	$21

Energy Efficiency (in $ millions)



EE	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Portfolio A	$1	$33	$38	$39	$28	$21	$25	$21	$21	$25	$21	$271
Portfolio B-2035	$0	$16	$19	$25	$23	$19	$16	$12	$7	$5	$1	$143
Portfolio B-2030	$1	$14	$20	$30	$32	$30	$6	$1	$1	$2	$1	$138

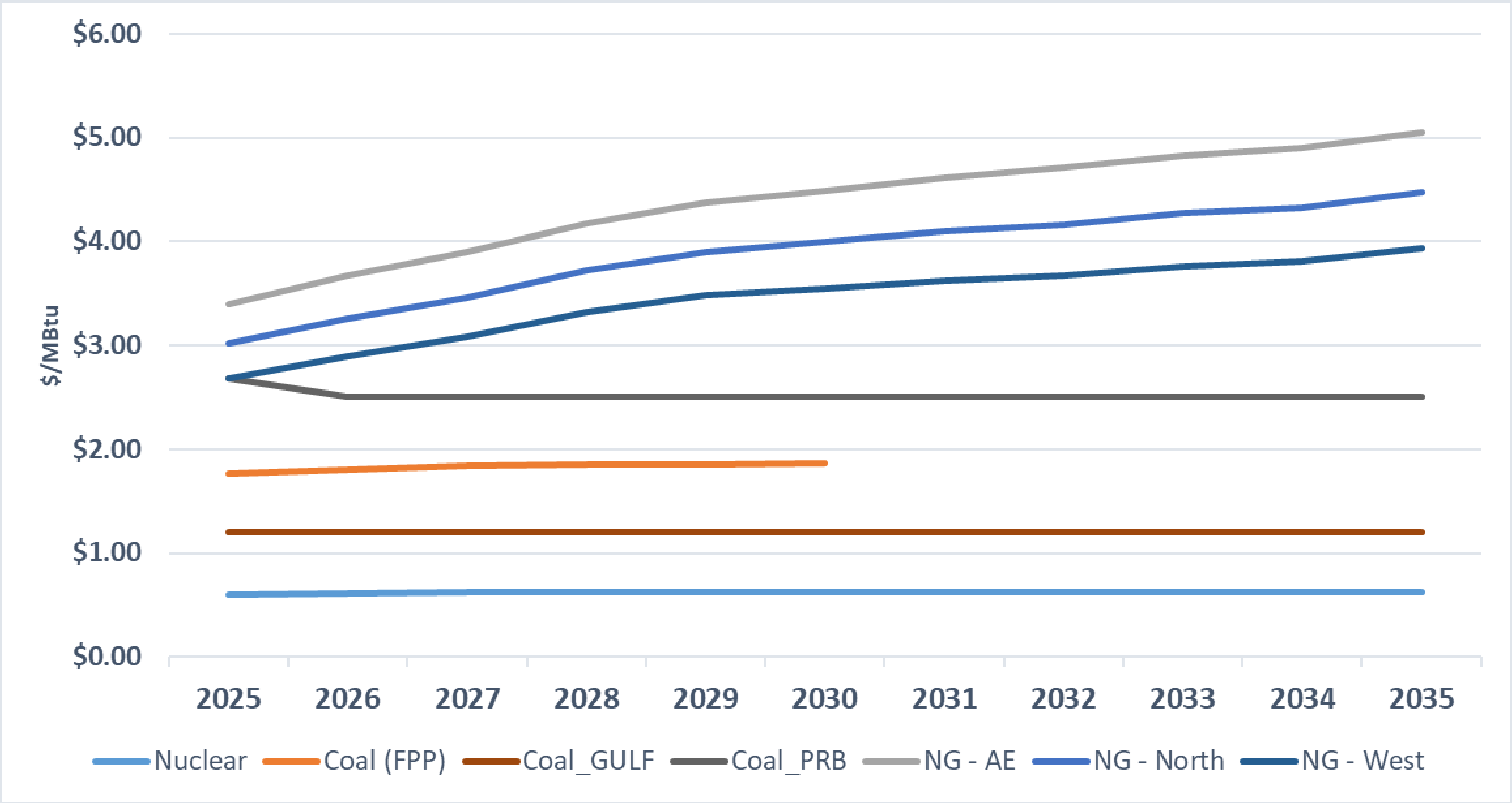
- *These costs are in addition to the existing budget and will result in increase Community Benefit Charges*
- *The costs are for summer peak reduction targets. The cost will be significantly higher (expensive) if winter programs are considered*

Key Assumptions: Technology Costs

Technology	Capital Cost ($/kW)	Variable O&M ($/MWh)	Fixed O&M ($/kW-yr)
Wind	1,848-1,884		22 - 24
Local Solar - Residential	0	99	0
Local Solar - Community	0	92	0
Battery Storage (4 hour duration)	1,133 - 1,204	0	14 - 16
Battery Storage (8 hour duration)	1,633 -2,352	0	14 - 16
Battery Storage (100 hour duration)	1,717-2,584	0	14 - 24

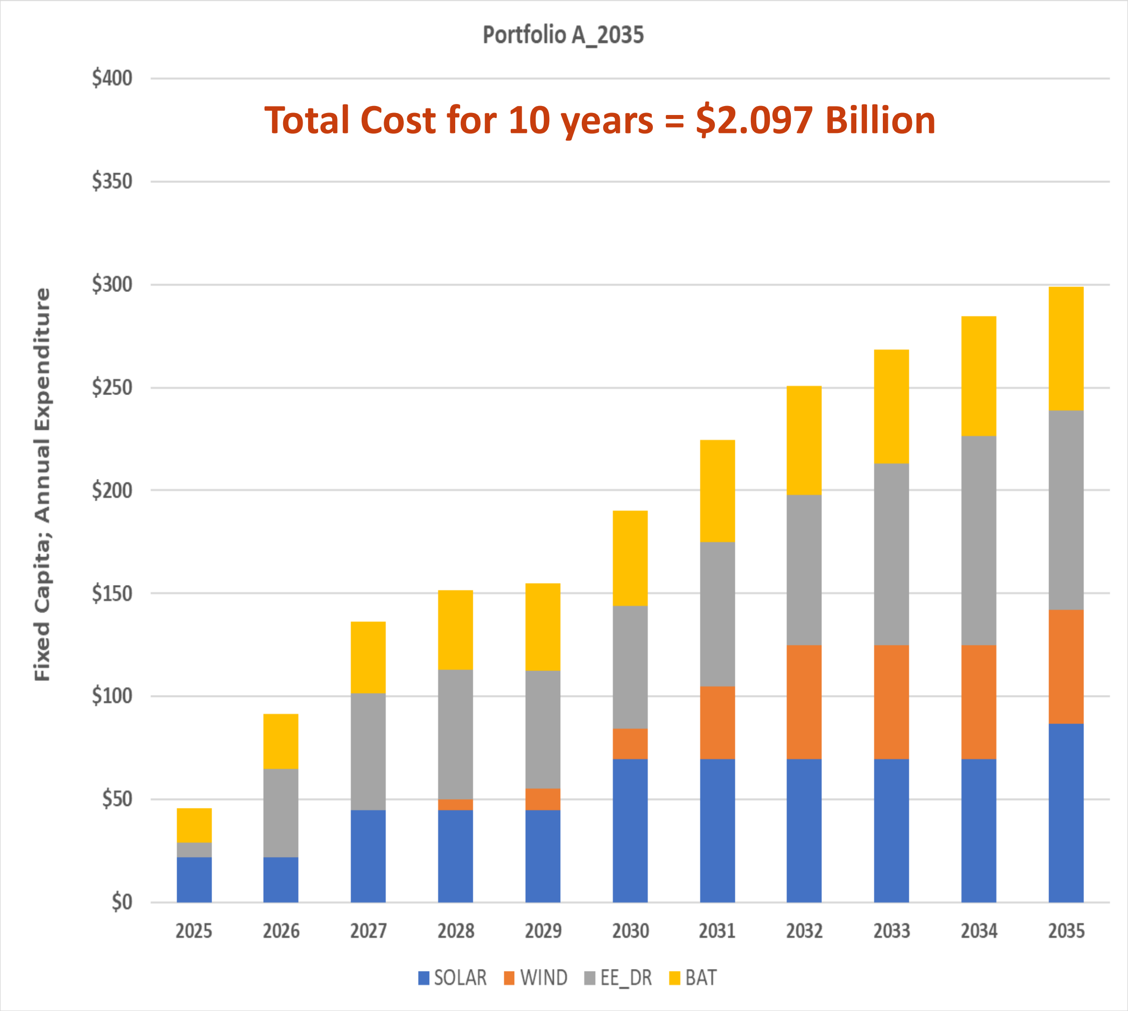
Note: From our understanding, 100-hour duration is still a concept, and the first fully operational 100-hour duration is expected to be 2026 – 2027 timeframe

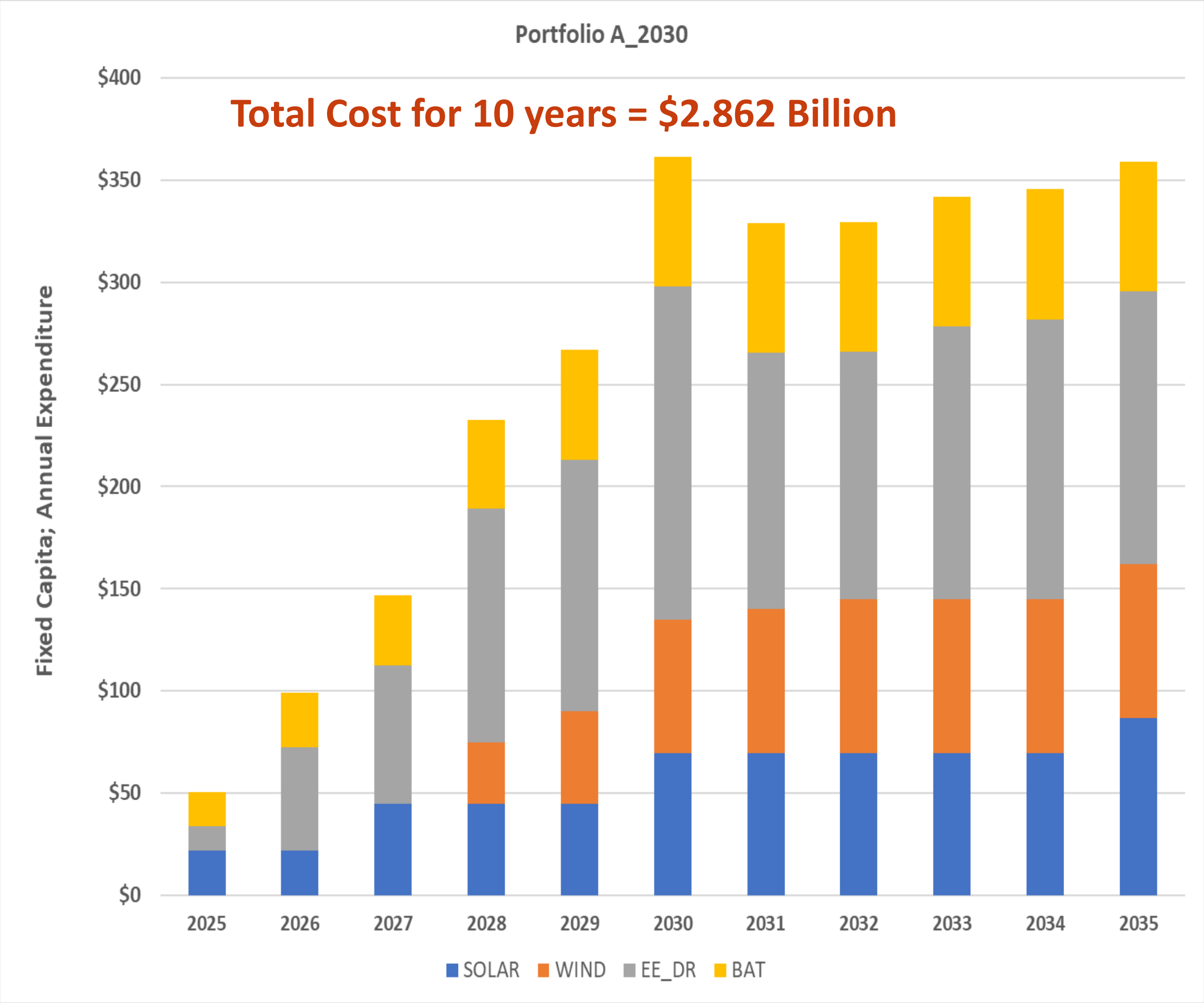
Key Assumptions: Fuel Price Projections



**Model assumes Fayette Power Project retirement in 2030*

Annual Cost (Fixed Cost in $Million)





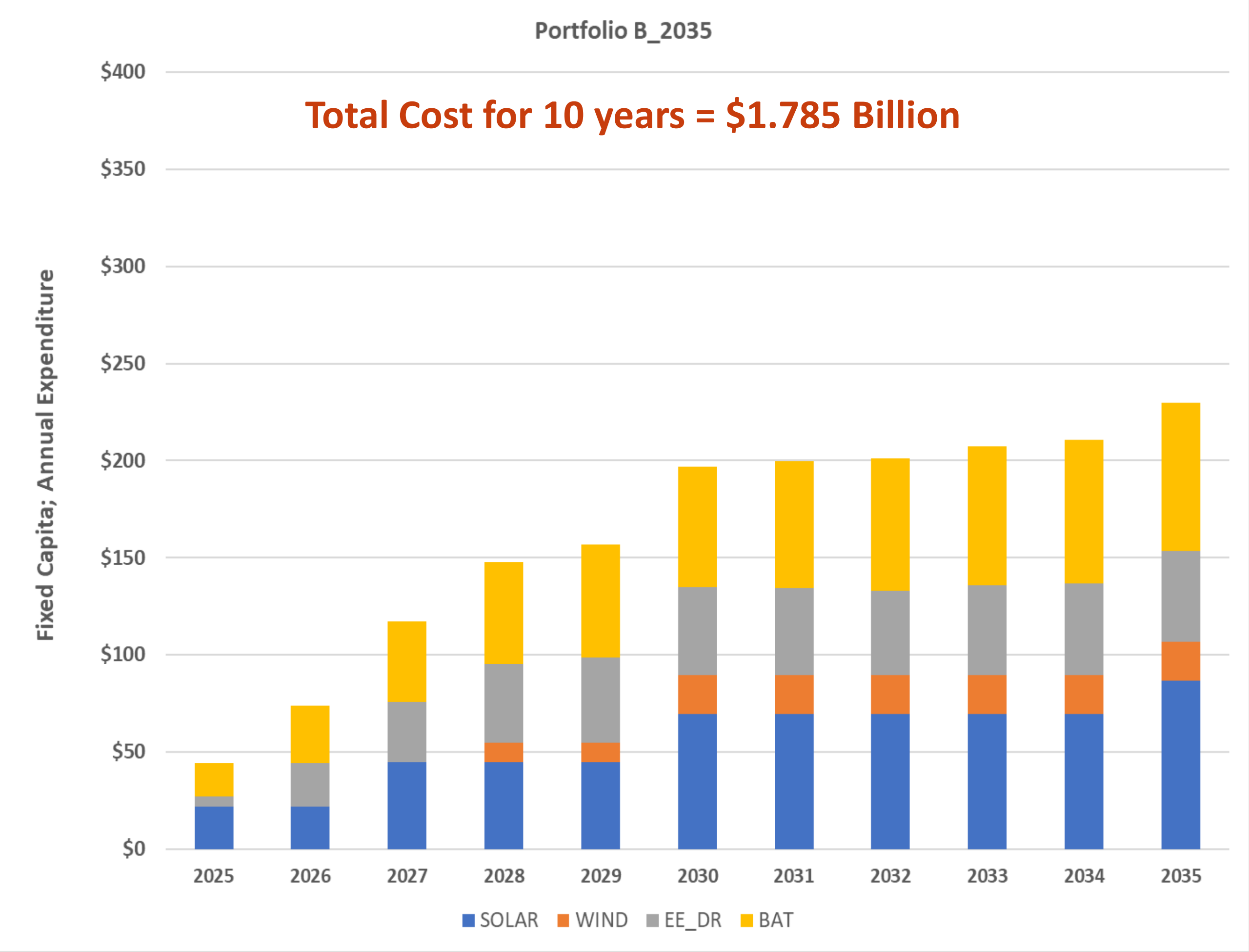
Note:

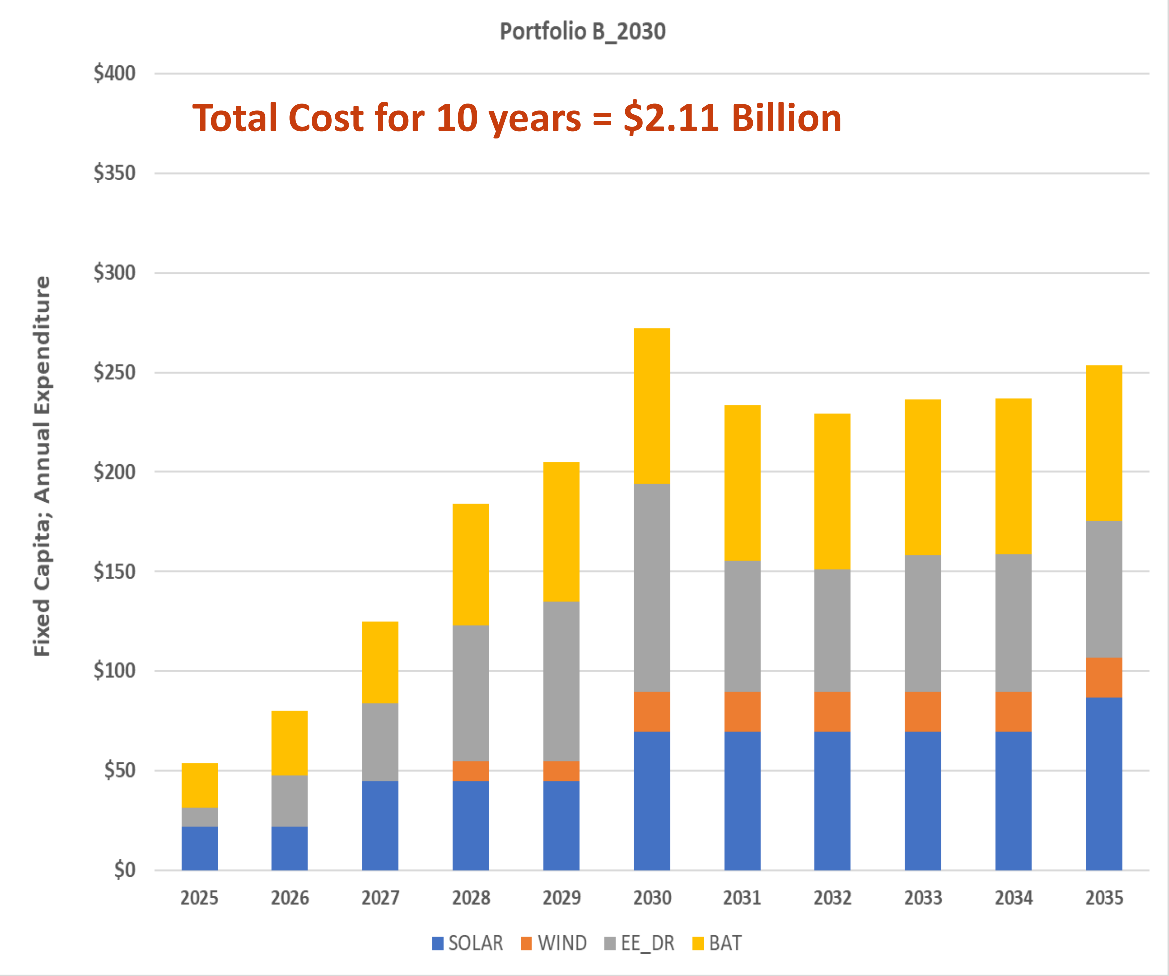
Solar, Wind and Batteries are assumed to be AE Built and Owned

EE and DR Cost are for the incentives, annual reimbursement and maintenance

Behind the meter Solar and Community Solar is recovered through the PSA

Annual Cost (Fixed Cost in $Million)

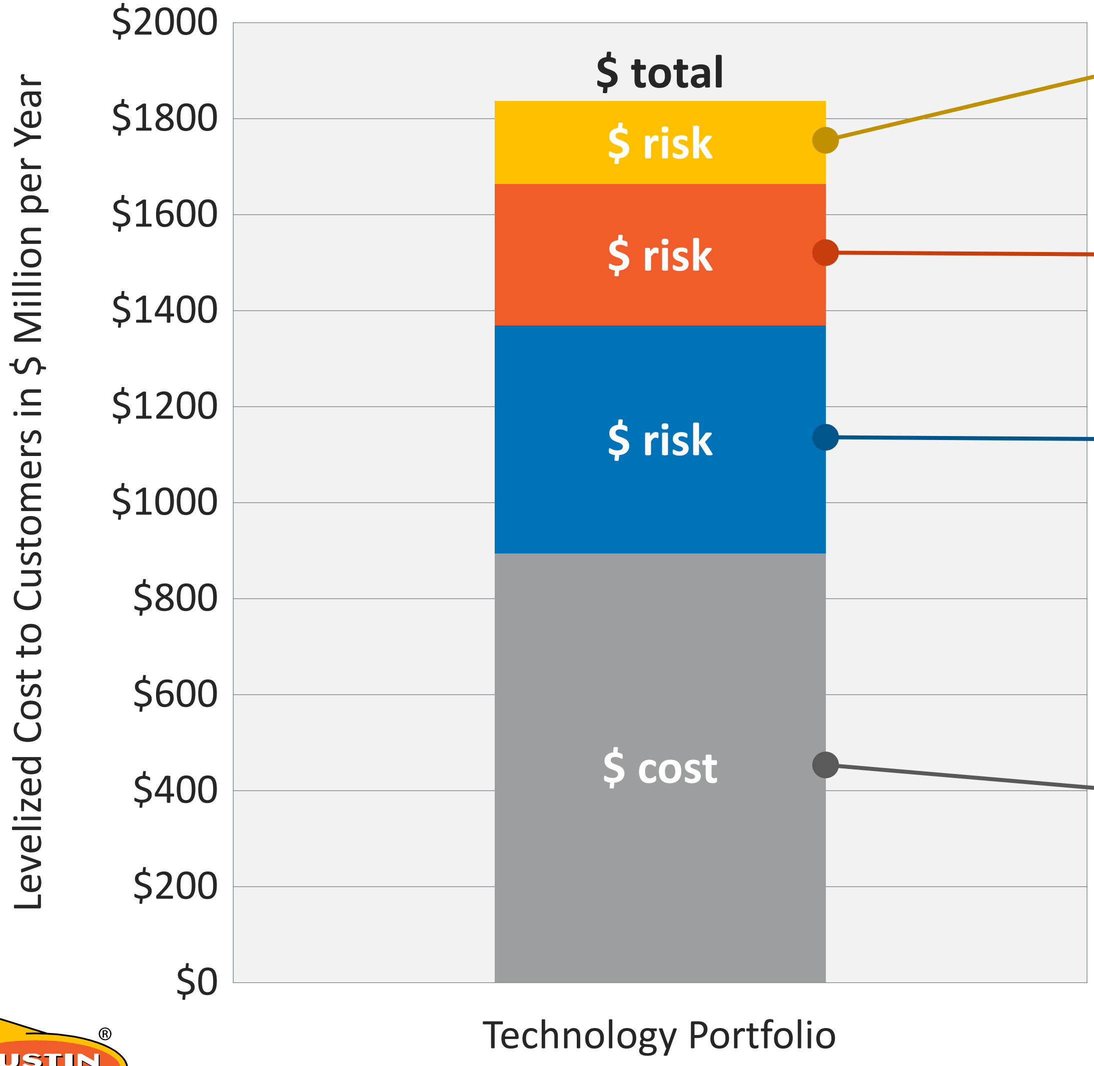




Note:
Solar, Wind and Batteries are assumed to be AE Built and Owned
EE and DR Cost are for the incentives, annual reimbursement and maintenance
Behind the meter Solar and Community Solar is recovered through the PSA

Result Summaries

Results Summary – The Framework



Quantifies the additional annual risk (cost) to customers due to **market rule changes**, based on portfolio's Effective Load Carrying Capability (ELCC)

Quantifies the additional annual risk (cost) to customers for a particular technology portfolio due to **local congestion**

Quantifies the additional annual risk (cost) to customers for a particular technology portfolio under **extreme weather conditions** in any given year

Quantifies the **annual levelized cost to customers** for a particular technology portfolio under normal conditions

This includes the capital and O&M costs of new supply resources and the removal of O&M of existing supply resources when they are retired

For comparison purposes, the current power supply cost to customers is approximately $585 million per year

Results Summary – Portfolio A_2035

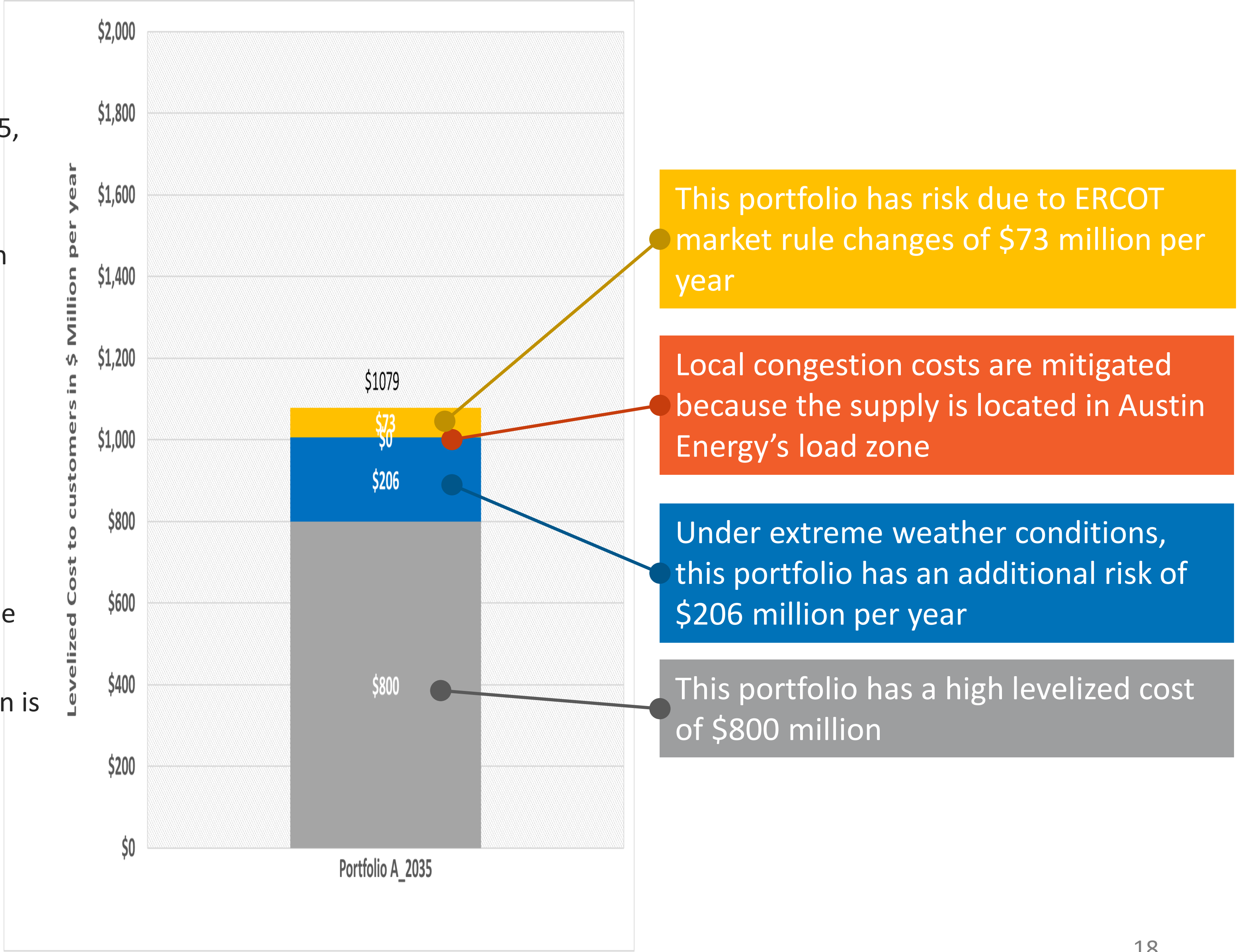
WG1

Key Assumptions

- Includes technologies as laid out by EUC WG
- All 1400 MW of existing generation retired at end of 2035, which means they are available in the Extreme Weather analysis year
- Assumes EE and behind the meter solar is available when the grid needs them the most

Key Takeaways

- The costs and the risk will be higher if EE/DR do not materialize
- It may not be feasible to obtain and host these large quantities of local solar and local storage
- Modeled EE and Demand Response quantities may not be feasible
- Significant risk will exist in 2036, the year after generation is retired*



*As seen in 2030 portfolios, which do not include existing generation in the Extreme Weather analysis year

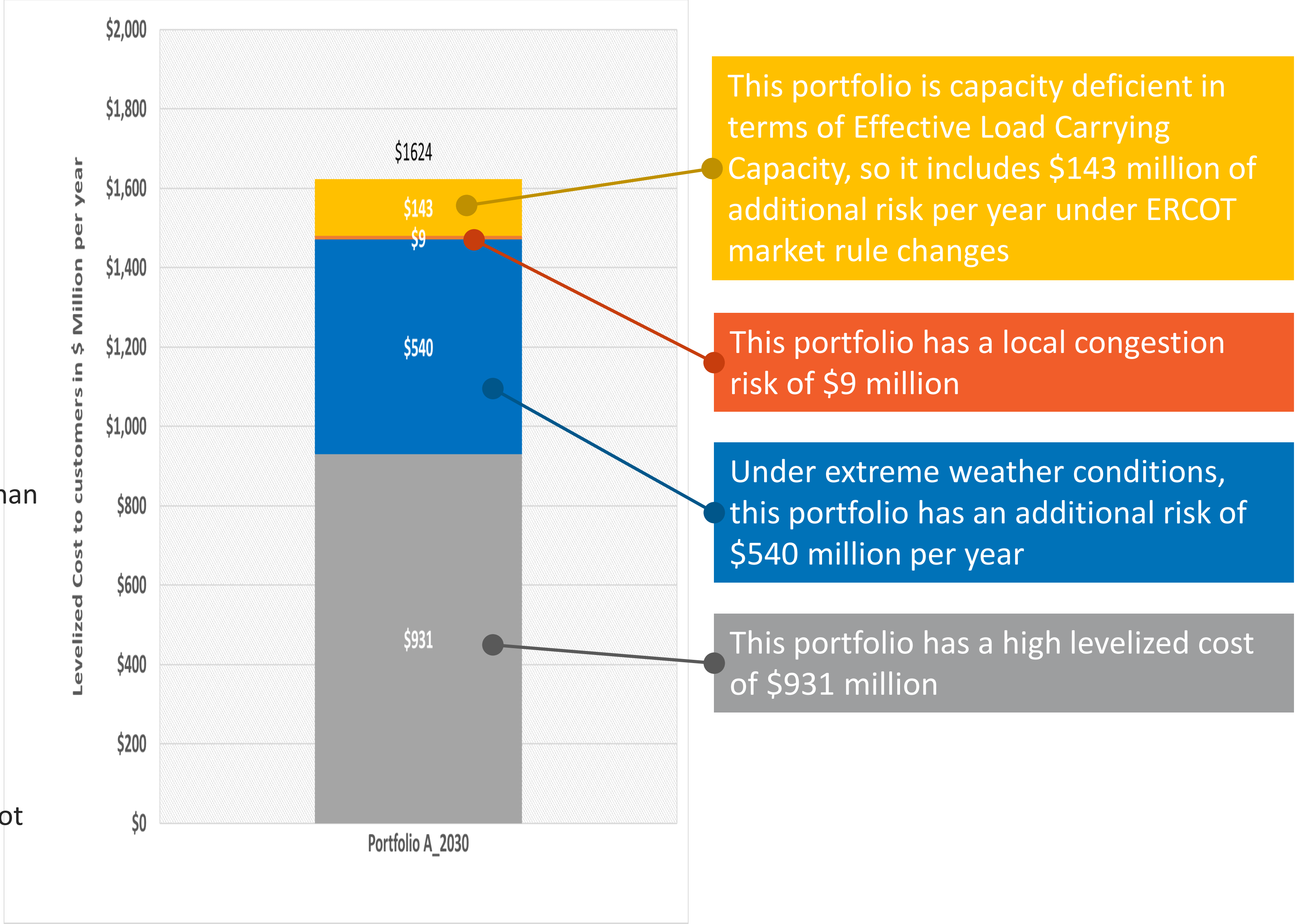
Results Summary – Portfolio A_2030

Key Assumptions

- Includes technologies as laid out by EUC WG
- All 1400 MW of existing generation retired at end of 2030
- Extreme weather analysis year is 2035, so no existing generation included
- Assumes EE and behind the meter solar is available when the grid needs them the most

Key Takeaways

- The portfolio is costly for customers, but less costly than the base case
- It does not mitigate risks during extreme weather
- The costs and the risk will be higher if EE/DR do not materialize
- It may not be feasible to obtain and host these large quantities of local solar and local storage
- Modeled EE and Demand Response quantities may not be feasible



Results Summary – Portfolio B_2035

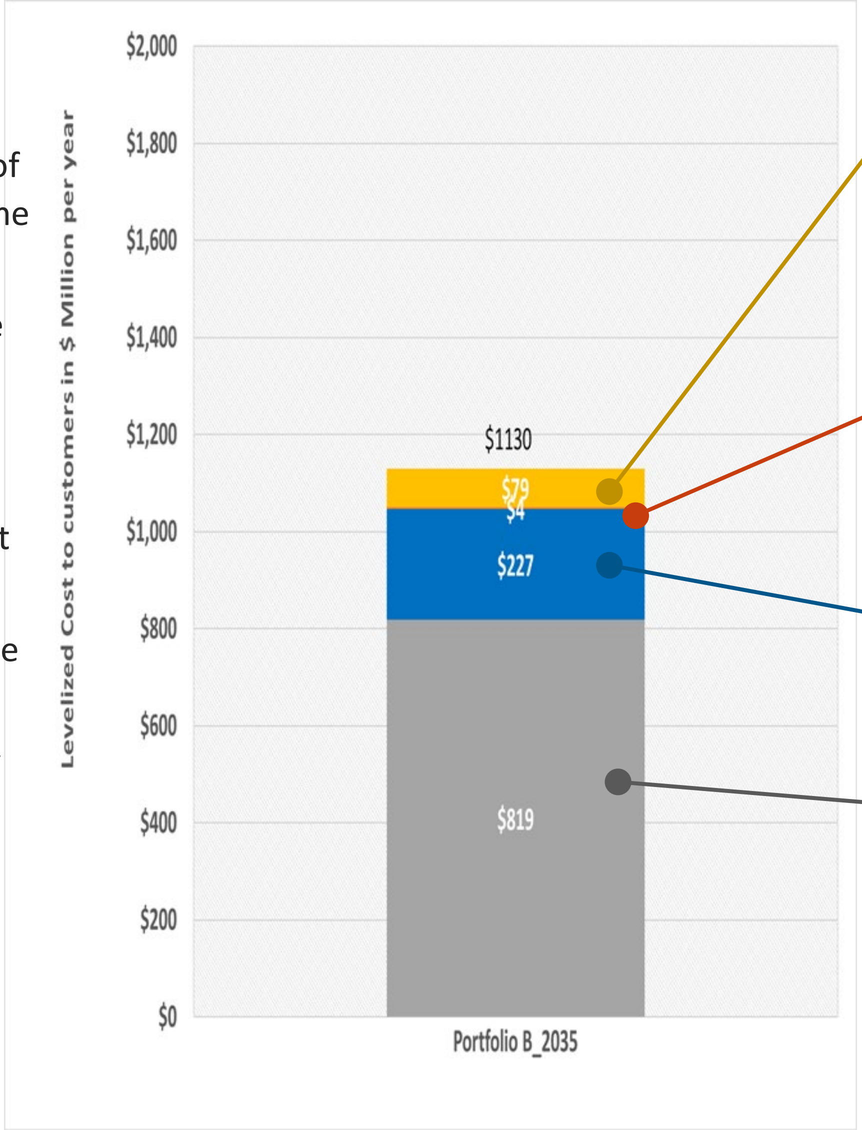
WG3

Key Assumptions

- Includes technologies as laid out by EUC WG
- All 1400 MW of existing generation retired at end of 2035, which means they are available in the Extreme Weather analysis year
- Assumes EE and behind the meter solar is available when the grid needs them the most

Key Takeaways

- The costs and the risk will be higher if EE/DR do not materialize
- It may not be feasible to obtain and host these large quantities of local solar and local storage
- Modeled EE and Demand Response quantities may not be feasible
- Significant risk will exist in 2036, the year after generation is retired*



This portfolio has risk due to ERCOT market rule changes of $79 million per year

Local congestion is nearly gone because the supply is located in Austin Energy's load zone

Under extreme weather conditions, this portfolio has an additional risk of $227 million per year

This portfolio has a high levelized cost of $819 million

As seen in 2030 portfolios, which do not include existing generation in the Extreme Weather analysis year

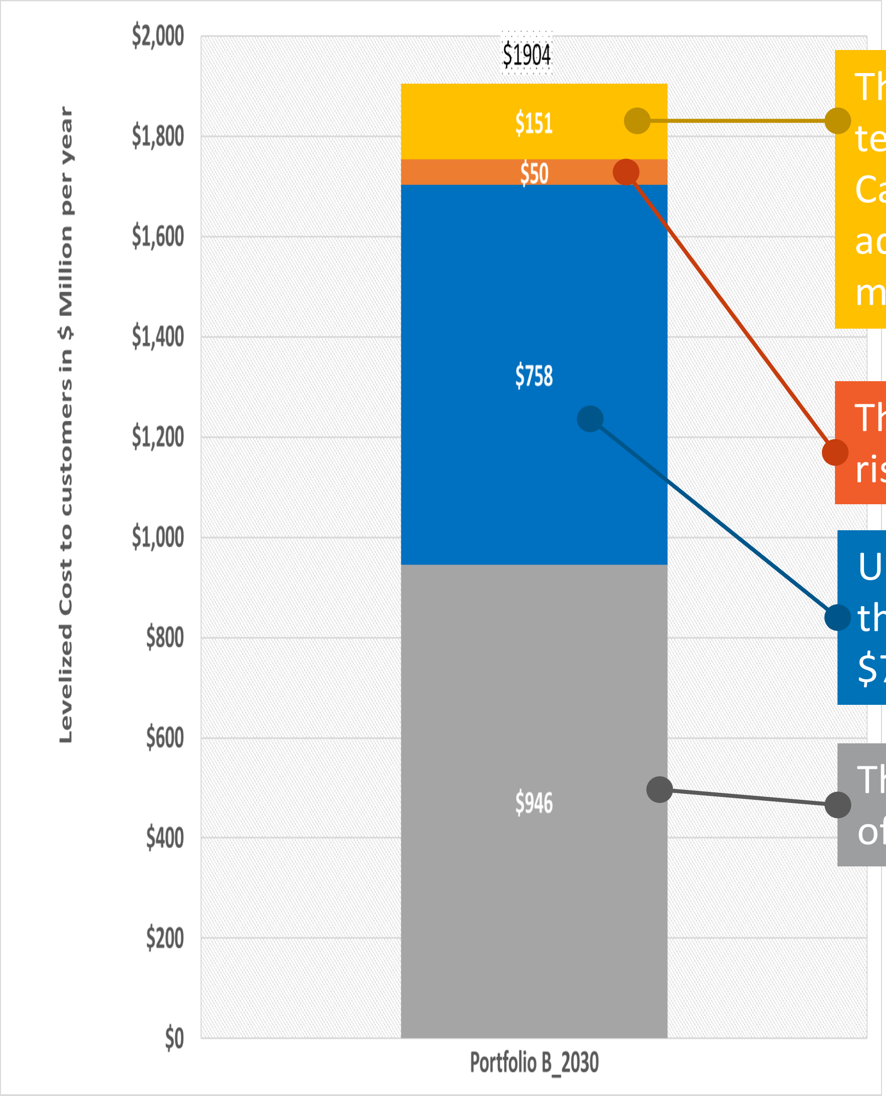
Results Summary – Portfolio B_2030

Key Assumptions

- Includes technologies as laid out by EUC WG
- All 1400 MW of existing generation retired at end of 2030
- Extreme weather analysis year is 2035, so no existing generation included
- Assumes EE and behind the meter solar is available when the grid needs them the most

Key Takeaways

- The portfolio is the most costly and risky for customers, even higher than the base case
- It does not mitigate risks during extreme weather, and may include bankruptcy risk
- The costs and the risk will be higher if EE/DR do not materialize
- It does not perform well under ERCOT market rule changes and presents local congestion risk
- It may not be feasible to obtain and host these large quantities of local solar and local storage
- Modeled EE and Demand Response quantities may not be feasible



This portfolio is capacity deficient in terms of Effective Load Carrying Capacity, so it includes $151 million of additional risk per year under ERCOT market rule changes

This portfolio has a local congestion risk of $50 million

Under extreme weather conditions, this portfolio has an additional risk of $758 million per year

This portfolio has a high levelized cost of $946 million

Criteria Definitions

Flawed   Challenged   Meets Criteria

Affordable

- Green/Yes- affordability impact does not exceed a 2% increase threshold
- Red/No- affordability impact exceeds the 2% increase threshold

Total Cost/Risk (in $millions)

- Green- is the cost : 0 to 7.5% Increase from the lowest risk in that scenario
- Yellow- is the cost :7.5% to 20% Increase from the lowest risk in that scenario
- Red- is the cost: >20% Increase from the lowest risk in that scenario

Levelized cost (in $millions)

- Green- is the cost : 0 to 7.5% Increase from the lowest risk in that scenario
- Yellow- is the cost :7.5% to 20% Increase from the lowest risk in that scenario
- Red- is the cost: >20% Increase from the lowest risk in that scenario

Criteria Definitions

Flawed   Challenged   Meets Criteria

Extreme Weather Risk (in $millions)

- Green- is the cost : 0 to 7.5% Increase from the lowest risk in that scenario
- Yellow- is the cost :7.5% to 20% Increase from the lowest risk in that scenario
- Red- is the cost: >20% Increase from the lowest risk in that scenario

Local Congestion Risk (in $millions)

- Green- is the cost : 0 to 7.5% Increase from the lowest risk in that scenario
- Yellow- is the cost :7.5% to 20% Increase from the lowest risk in that scenario
- Red- is the cost: >20% Increase from the lowest risk in that scenario

ERCOT Market Change Risk (in $millions)

- Green- is the cost : 0 to 7.5% Increase from the lowest risk in that scenario
- Yellow- is the cost :7.5% to 20% Increase from the lowest risk in that scenario
- Red- is the cost: >20% Increase from the lowest risk in that scenario

Working Group Summary Matrix

Flawed | Challenged | Meets Criteria

ID	Technology Portfolio	Carbon Free by 2035	Renewable Goals	Demand Side Mgmt Goals	Affordable	Total Cost/Risk (in $Million)	Levelized Cost (in $Million)	Extreme Weather Risk (in $Million)	Local Congestion Risk (in $Million)	ERCOT Market Rule Change Risk (in $Million)
WG1	Portfolio A_2035	Yes	Yes	Yes	No	$1,079	$800	$206	$0	$73
WG2	Portfolio A_2030	Yes	Yes	Yes	No	$1,624	$931	$540	$9	$143
WG3	Portfolio B_2035	Yes	Yes	Yes	No	$1,130	$819	$227	$4	$79
WG4	Portfolio B_2030	Yes	Yes	Yes	No	$1,904	$946	$758	$50	$151
Mapping to 2030 Plan Objectives:			ES		A CS	A CS	A CS	R A CS	R A CS	R A CS

Environmental Sustainability

Affordability
Cost Stability

Reliability
Affordability
Cost Stability

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Summary Matrix

Flawed | Challenged | Meets Criteria

ID	Technology Portfolio	Carbon Free by 2035	Renewable Goals	Demand Side Mgmt Goals	Affordable	Total Cost/Risk (in $Million)	Levelized Cost (in $Million)	Extreme Weather Risk (in $Million)	Local Congestion Risk (in $Million)	ERCOT Market Rule Change Risk (in $Million)
1	CF_2035 (Current 2030 Plan or Base Case)	Yes	Yes	Yes	No	$1,843	$899	$477	$294	$173
2	CF_2035 without REACH	Yes	Yes	Yes	No	$1,836	$892	$477	$294	$173
3	CF_2035 + LSOL	Yes	Yes	Yes	No	$1,517	$933	$417	$2	$164
4	CF_2035 + LDST	Yes	Yes	Yes	No	$1,668	$933	$424	$226	$85
5	CF_2035 + HCCC	Yes	Yes	Yes	Yes	$838	$599	$161	$3	$75
6	CF_2035 + LSOL + HCCC	Yes	Yes	Yes	Yes	$954	$630	$231	$1	$92
7	CF_2035 + LDST + HCCC	Yes	Yes	Yes	Yes	$902	$643	$185	($3)	$77
8	CF_2035 + LSOL + LLDST + DST	Yes	Yes	Yes	No	$1,544	$944	$448	($1)	$153
9	CF_2035 + LLDST + DST + HCCC	Yes	Yes	Yes	Yes	$1,003	$651	$264	$2	$86
10	CF_2035 + LSOL + LLDST + DST + DSM	Yes	Yes	Yes	No	$1,582	$907	$523	$5	$146
11	CF_2035 + LSOL + LLDST + DST + HCCC	Yes	Yes	Yes	Yes	$1,158	$757	$304	($4)	$102
	Mapping to 2030 Plan Objectives:	ES			A CS	A CS	A CS	R A CS	R A CS	R A CS

Environmental Sustainability

Affordability
Cost Stability

Reliability
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