Benefit analysis of improved integration of unscheduled price-responsive resources into the NEM

Sensitivity modelling results

8 July 2024

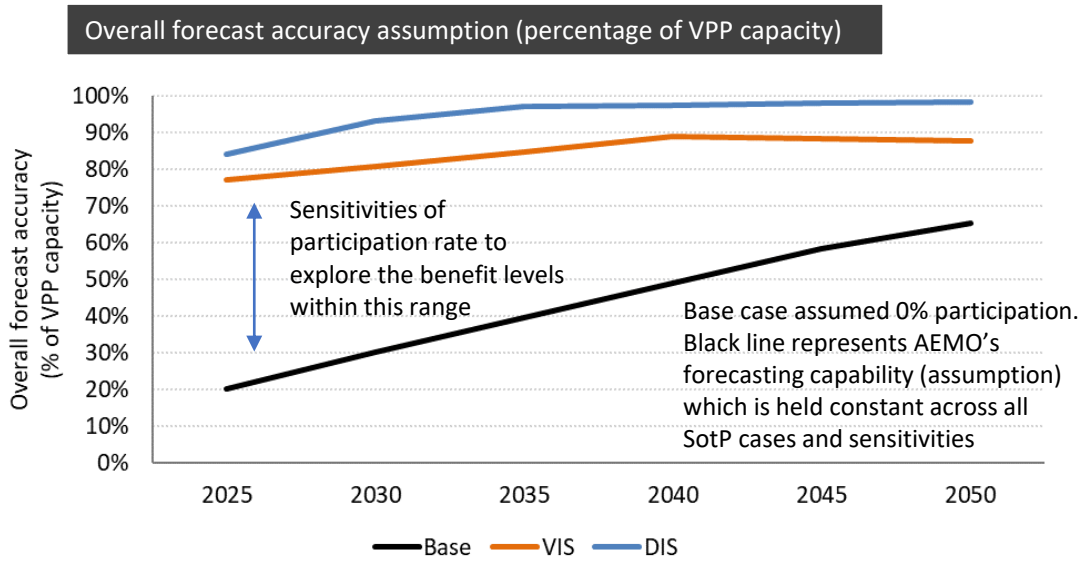
IES
Intelligent Energy Systems

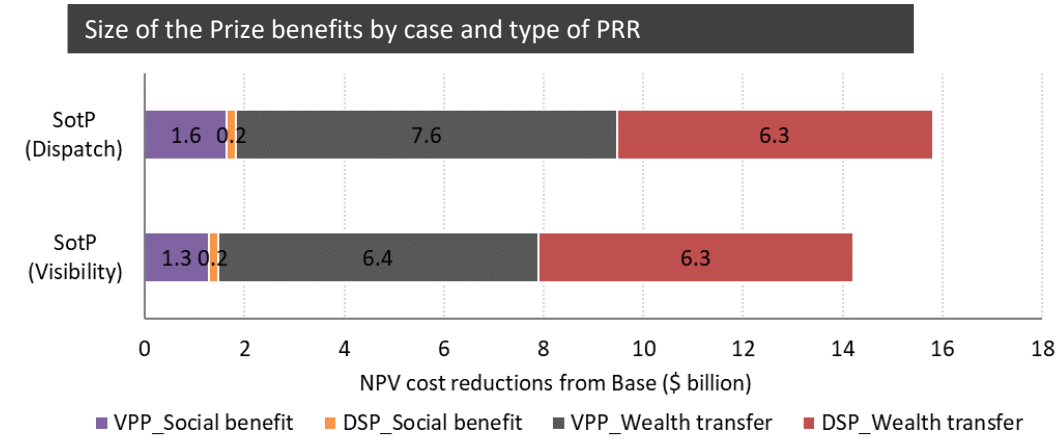
Overview and notes

- Overview of slide deck
  - Background and modelling objectives
  - Updated modelling assumptions
  - Results summary and key findings

Notes:
- The modelling presented here explores sensitivities around the participation rates for unscheduled price-responsive resources in central dispatch.
- The modelling approach remains unchanged. Refer to the Size of the Prize benefits modelling report for details of the methodology.
- The updated assumptions have been provided by the AEMC. Refer to the AEMC draft determination for further information.
- Dollar values are in real 2023 AUD terms. Net present values (NPV) are as of 2025 and is based on a 7% pa (real) discount rate.

Sensitivity modelling objectives



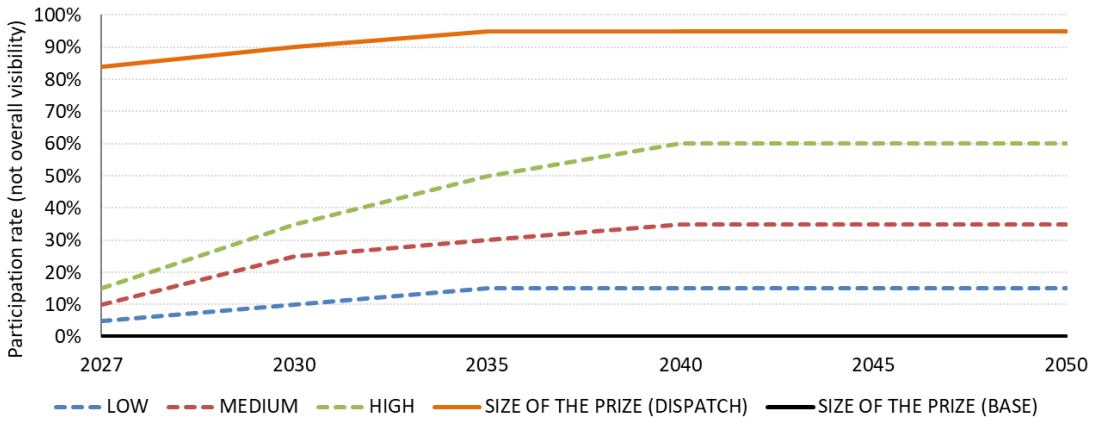


- The Size of the Prize (SotP) Dispatch modelling established the upper bound for the potential benefits of integrating price responsive resources (PRR)
  - Up to $1.8 billion in social benefits and $13.9 billion in wealth transfers

- The sensitivity modelling explores more probable benefits from a range of (lower) participation assumptions and includes:
  - Assumes a Nov 2026 (earliest) start date
  - Dispatch mode only, i.e., participating PRR is integrated with central dispatch and assumes 100% conformance
  - AEMO forecasting accuracy unchanged
  - DSP benefits unchanged and is fixed across all sensitivities modelled

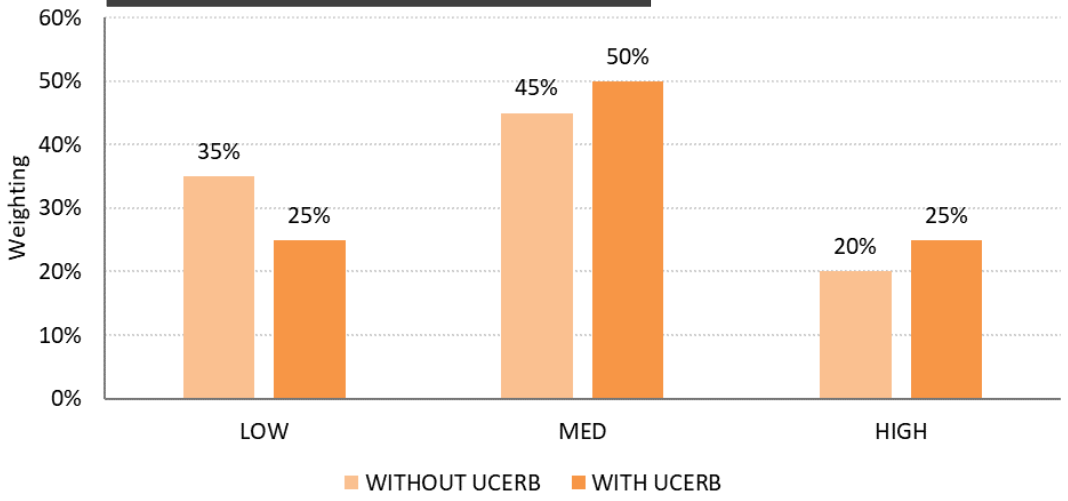
Sensitivity modelling assumption changes

Participation rates (before AEMO forecasting corrections)

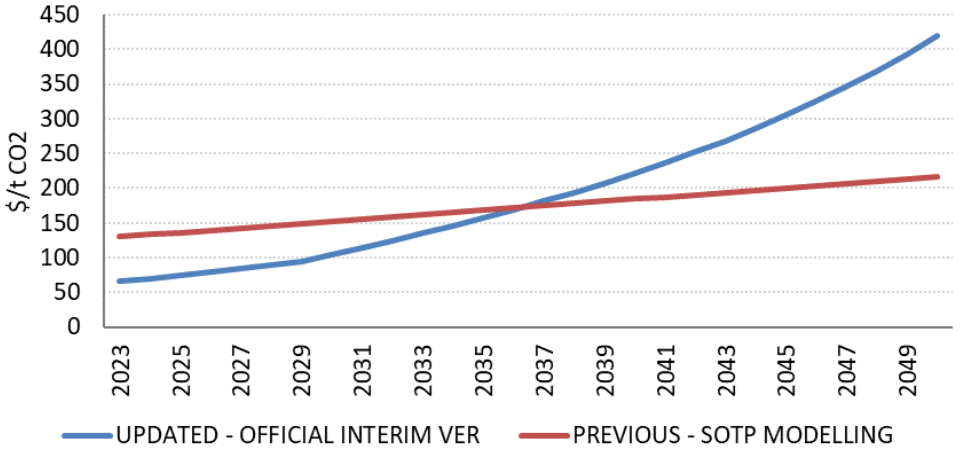


- Sensitivities covers a Low, Med and High case. The High case reaches 60% participation by 2050
- The High case assumes aggregated energy storage systems can supply 80% of its capacity for regulation, up from 40% assumed in the SotP Dispatch modelling
- Overall benefits are weighted assuming with and without Unlocking CER Benefits through Flexible Trading (UCERB)
- Value of Emissions Reduction (VER) updated to the official interim VER agreed by energy ministers and published by AER & AEMC in March 2024
- Linear interpolation is applied (previously forward-filled)

Weighting assumptions



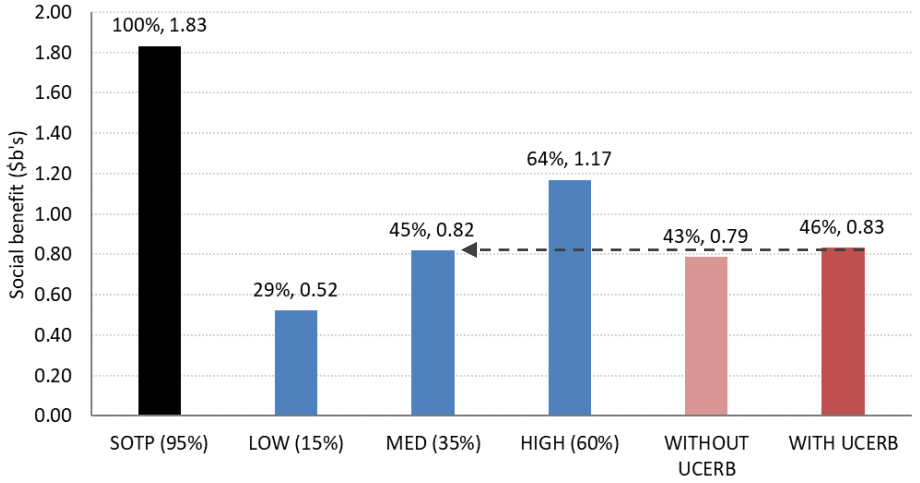
Value of Emissions Reduction assumptions



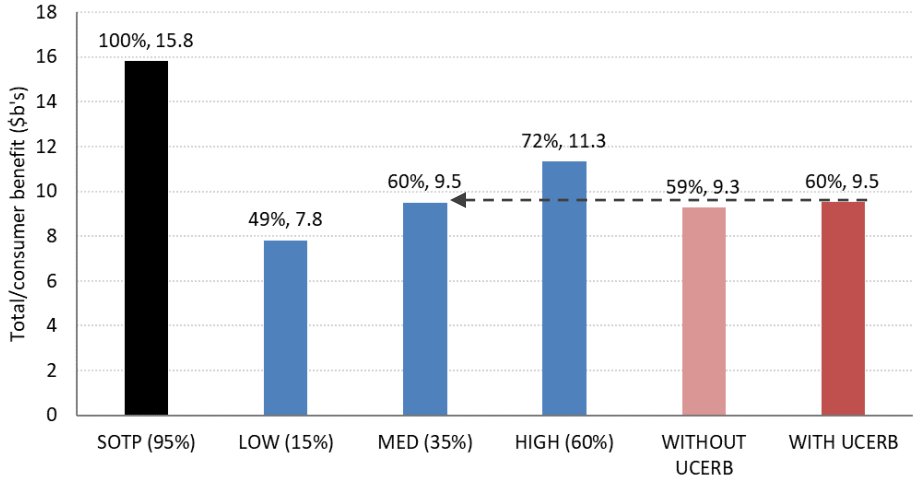
Summary results and key findings

Result summary, participation and benefit relationship

Total social benefits by case (VPP + DSP, NPV)



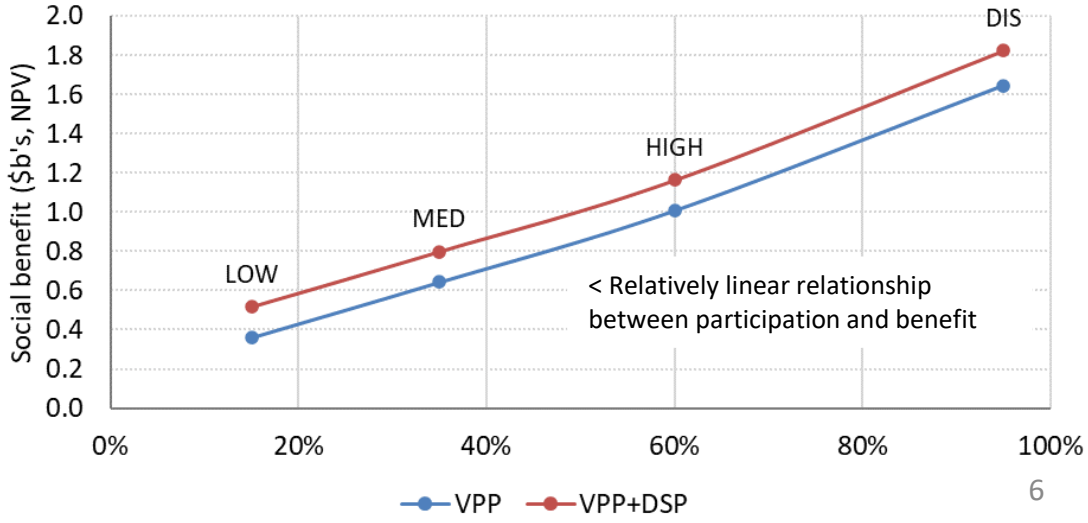
Total consumer benefits by case (VPP + DSP, NPV)



* Labels include the participation rate in 2050

- The sensitivities captures 25-65% of the total SotP Dispatch case social benefit, and 45-75% of the consumer benefit (sensitivities assume full capture of SotP DSP benefit)
- There is an approximate linear relationship between participation rate and social benefit. The wealth transfer component (not shown here) is also linear
- With and without UCERB weighted outcomes are similar and close to Med case because of the linear relationship and (generally) symmetric weightings

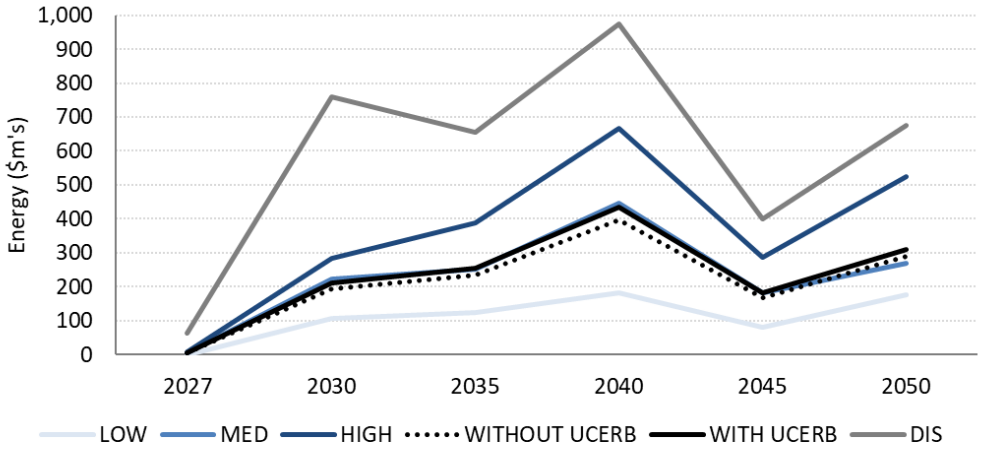
Social benefit against participation rate assumptions (2050, NPV)

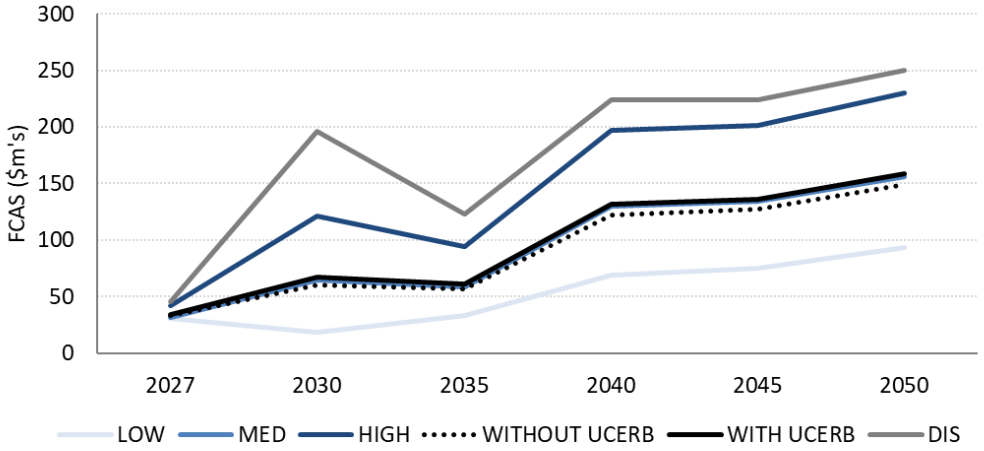


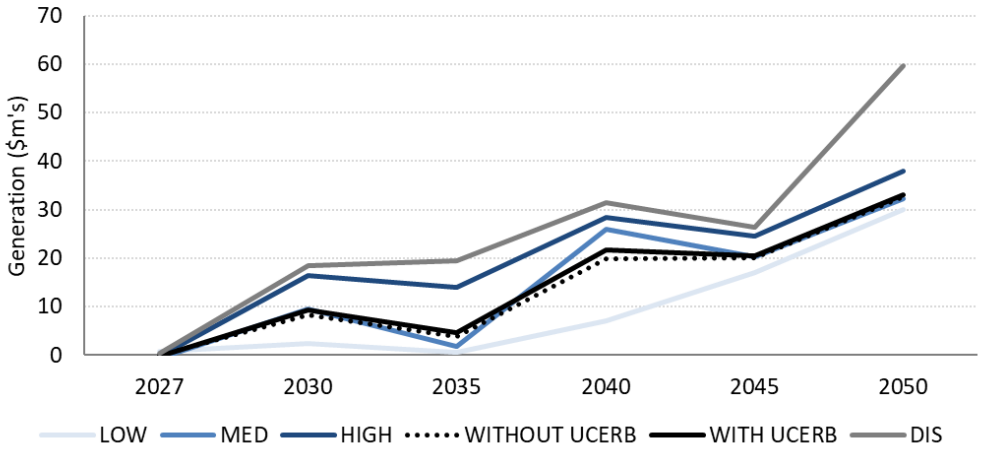
Benefit by cost component over time

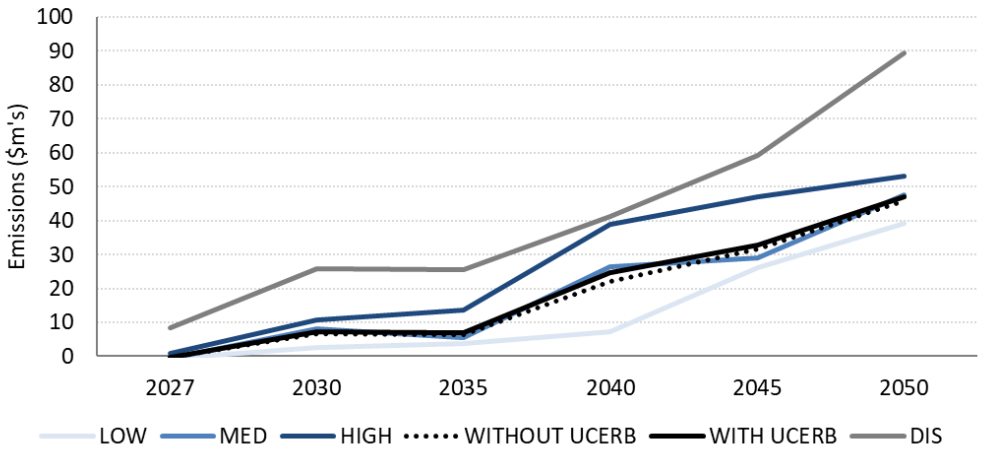
- The underlying modelling outcomes are consistent with the Size of the Prize modelling (Dispatch case)
- The benefits of the weighted cases are similar, and generally lines up to the Medium case

Benefits by cost categories (relative to Base case)





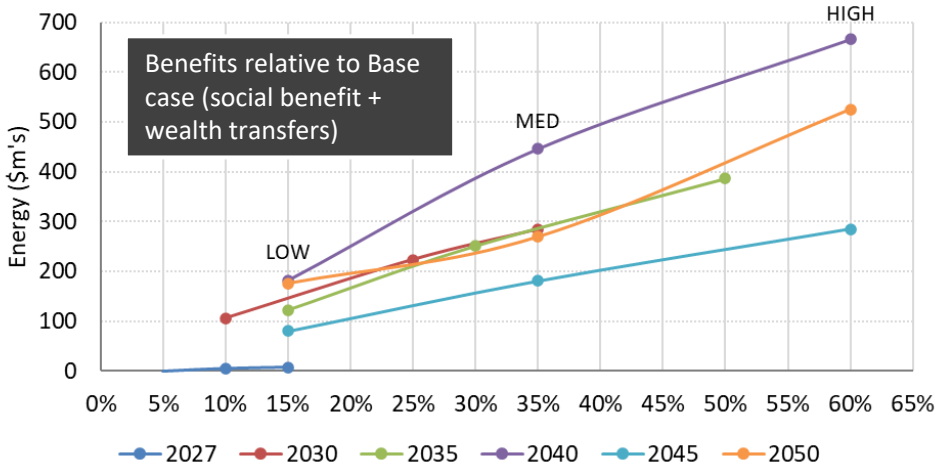


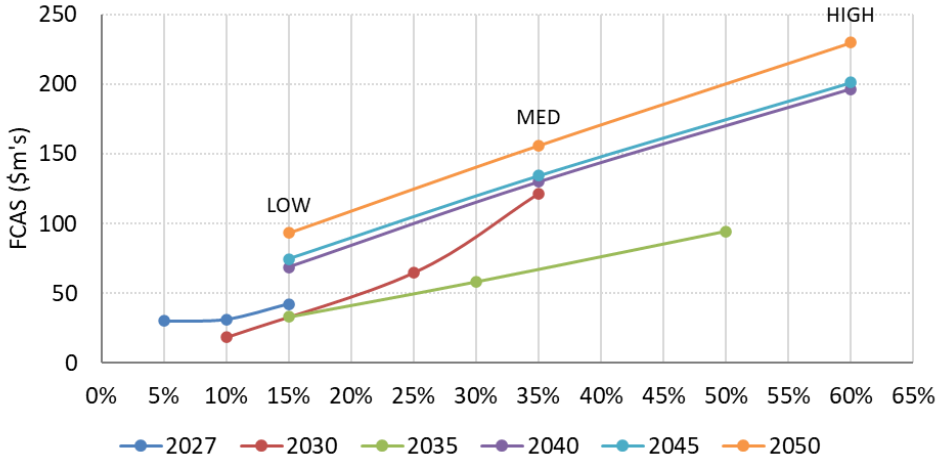


* The High case, although having higher regulation supply than the SotP Dispatch case, also has higher regulation requirements. The net effect results in a lower benefit than the SotP Dispatch case

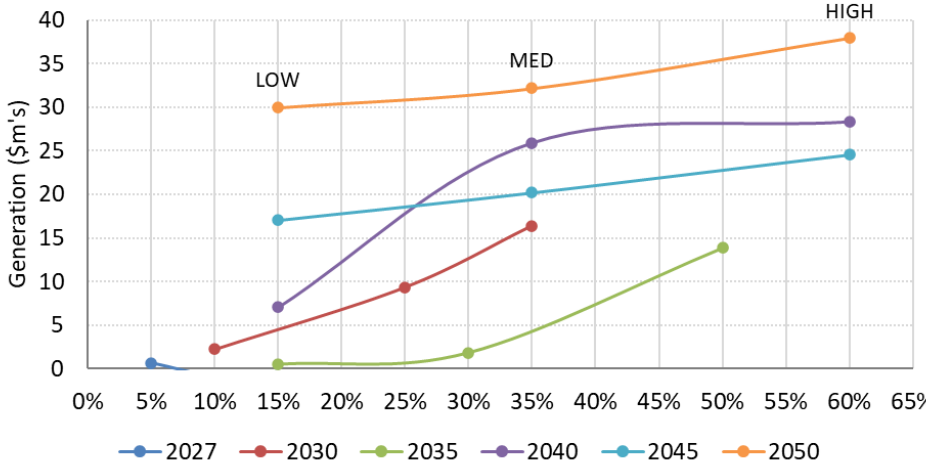
Benefit against participation rate by year and cost component

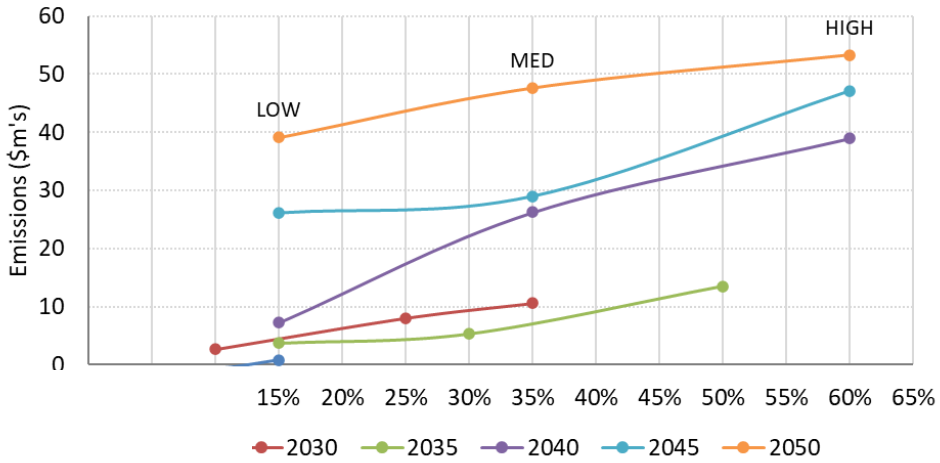
- The energy and FCAS components exhibit a relatively linear relationship due to the modelling approach for deriving energy and FCAS prices (refer to SotP modelling methodology).
- The generation and emissions benefit relationship is impacted by the generation mix over time and VER trajectory





* Each point on a line corresponds to one of the sensitivity cases. The left-most point corresponds to the Low case, and the right-most point corresponds to the High case.





* 2027 assumes low participation and isn't a full year, resulting in relatively low benefits. Some of the2027 benefit values are negative (but less than $0.5m).

Benefits overview

- Results section has been split into social benefits and wealth transfers across the relevant cost categories
- All figures are in June 2023 dollars and NPV figures are calculated as of 2025 at 7% pa
- Dispatch case modelling starts from FY2025. Sensitivity results assumes a November 2026 start date

Benefit ($b's)	Social benefit	Wealth transfer	Consumer benefit
SIZE OF THE PRIZE (95%)	1.83	13.97	15.80
LOW (15%)	0.52	7.29	7.81
MED (35%)	0.82	8.74	9.56
HIGH (60%)	1.17	10.15	11.32
WITHOUT UCERB	0.79	8.51	9.30
WITH UCERB	0.83	8.73	9.56

Appendices: Social benefit and wealth transfer by case

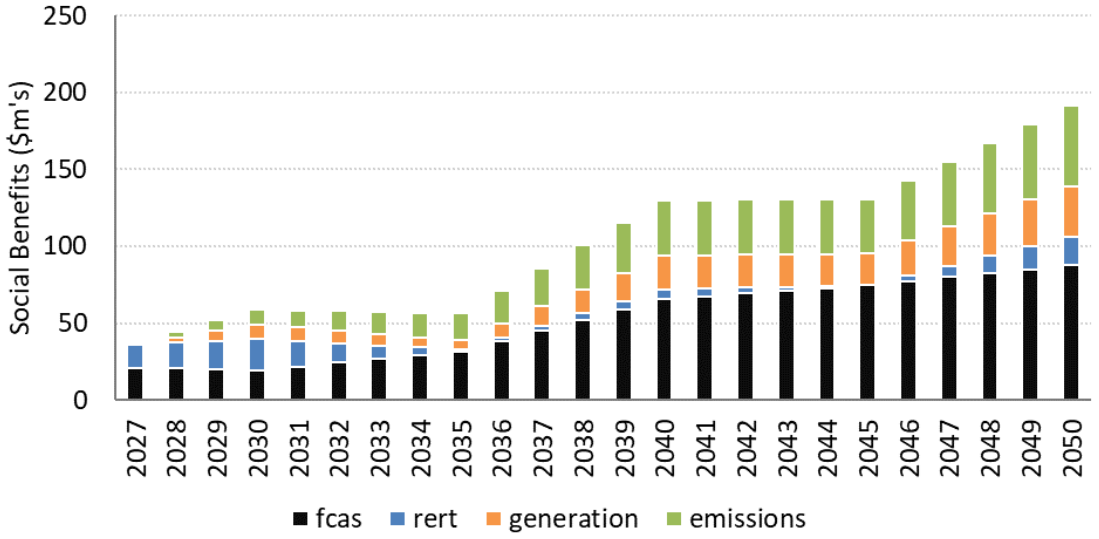
Social benefit

NPV, millions	Low	Medium	High	With UCERB
Energy	0	0	0	0
FCAS	220	403	617	411
Generation	63	120	180	121
RERT	100	100	100	100
Emissions	140	199	274	203
Total	523	821	1,170	834

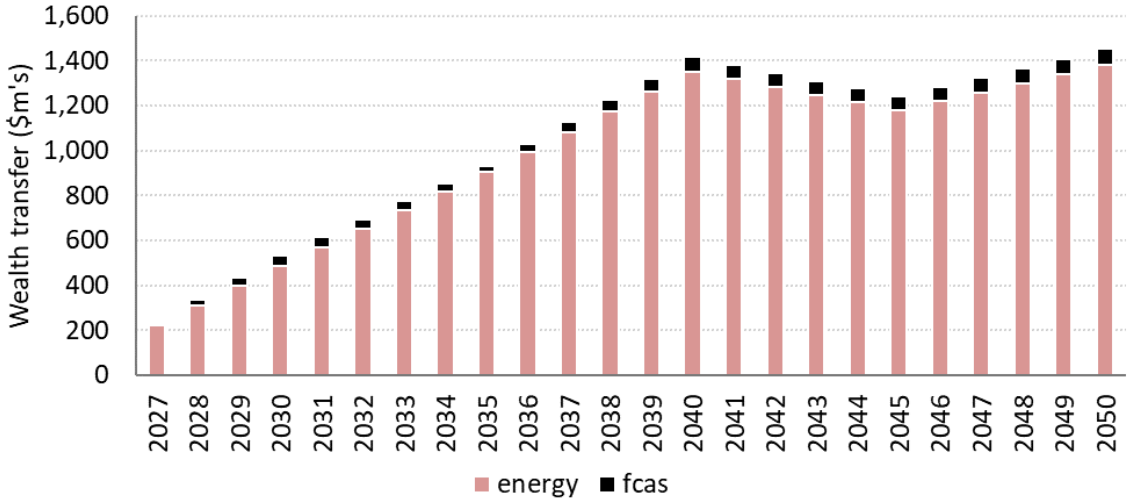
Wealth transfer

NPV, millions	Low	Medium	High	With UCERB
Energy	7,070	8,315	9,448	8,287
FCAS	216	426	699	442
Generation	0	0	0	0
RERT	0	0	0	0
Emissions	0	0	0	0
Total	7,286	8,741	10,147	8,729

With UCERB



With UCERB



Appendices: Benefits by component and case (NPV, millions)

Low	Social benefit	Wealth transfer	Total benefit
Energy	0	7,070	7,070
FCAS	220	216	436
Generation	63	0	63
RERT	100	0	100
Emissions	140	0	140
Total	523	7,286	7,809

Med	Social benefit	Wealth transfer	Total benefit
Energy	0	8,315	8,315
FCAS	403	426	829
Generation	120	0	120
RERT	100	0	100
Emissions	199	0	199
Total	821	8,741	9,562

High	Social benefit	Wealth transfer	Total benefit
Energy	0	9,448	9,448
FCAS	617	699	1,315
Generation	180	0	180
RERT	100	0	100
Emissions	274	0	274
Total	1,170	10,147	11,317

Weighted outcomes

With UCERB	Social benefit	Wealth transfer	Total benefit
Energy	0	8,287	8,287
FCAS	411	442	852
Generation	121	0	121
RERT	100	0	100
Emissions	203	0	203
Total	834	8,729	9,563

Without UCERB	Social benefit	Wealth transfer	Total benefit
Energy	0	8,106	8,106
FCAS	382	407	789
Generation	112	0	112
RERT	100	0	100
Emissions	193	0	193
Total	787	8,513	9,300

Appendices: Annual benefits by case

$ Millions	Benefit type	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
LOW	Social benefit	0	0	37	37	37	36	36	35	35	35	34	40	46
MED	Social benefit	0	0	36	45	53	61	59	57	55	53	51	67	84
HIGH	Social benefit	0	0	39	52	65	78	80	83	85	87	89	109	129
WITHOUT UCERB	Social benefit	0	0	37	43	49	56	55	54	54	53	53	66	80
WITH UCERB	Social benefit	0	0	37	45	52	59	58	58	57	57	56	71	86
LOW	Wealth transfer	0	0	227	282	337	393	472	551	631	710	790	859	928
MED	Wealth transfer	0	0	233	337	441	545	622	699	776	853	929	1,029	1,129
HIGH	Wealth transfer	0	0	245	382	519	655	741	826	912	997	1,083	1,201	1,320
WITHOUT UCERB	Wealth transfer	0	0	233	327	420	514	593	673	752	832	911	1,004	1,097
WITH UCERB	Wealth transfer	0	0	234	334	434	534	614	694	774	853	933	1,030	1,127
LOW	Consumer benefit	0	0	264	319	374	429	508	587	666	745	824	899	974
MED	Consumer benefit	0	0	269	381	494	606	681	756	830	905	980	1,097	1,213
HIGH	Consumer benefit	0	0	284	434	583	733	821	909	997	1,084	1,172	1,311	1,449
WITHOUT UCERB	Consumer benefit	0	0	271	370	470	569	648	727	806	885	964	1,070	1,177
WITH UCERB	Consumer benefit	0	0	272	379	486	593	673	752	831	910	989	1,101	1,212

$ Millions	Benefit type	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
LOW	Social benefit	52	58	64	68	71	75	79	83	95	106	118	129	141
MED	Social benefit	101	117	134	132	130	128	126	124	137	150	163	176	189
HIGH	Social benefit	149	169	189	189	189	189	190	190	201	213	225	236	248
WITHOUT UCERB	Social benefit	93	107	120	121	121	122	122	123	135	147	160	172	184
WITH UCERB	Social benefit	101	115	130	130	130	130	130	130	143	155	167	179	192
LOW	Wealth transfer	997	1,067	1,136	1,132	1,127	1,123	1,118	1,114	1,149	1,185	1,221	1,256	1,292
MED	Wealth transfer	1,229	1,329	1,429	1,391	1,353	1,315	1,277	1,239	1,273	1,308	1,342	1,376	1,410
HIGH	Wealth transfer	1,438	1,557	1,675	1,613	1,552	1,490	1,428	1,367	1,432	1,497	1,562	1,628	1,693
WITHOUT UCERB	Wealth transfer	1,190	1,283	1,376	1,345	1,314	1,283	1,252	1,221	1,262	1,303	1,344	1,385	1,425
WITH UCERB	Wealth transfer	1,223	1,320	1,417	1,382	1,346	1,311	1,275	1,240	1,282	1,324	1,367	1,409	1,451
LOW	Consumer benefit	1,049	1,124	1,200	1,199	1,199	1,198	1,198	1,197	1,244	1,291	1,339	1,386	1,433
MED	Consumer benefit	1,330	1,446	1,562	1,522	1,483	1,443	1,403	1,363	1,410	1,458	1,505	1,552	1,600
HIGH	Consumer benefit	1,587	1,726	1,864	1,803	1,741	1,680	1,618	1,557	1,633	1,710	1,787	1,864	1,941
WITHOUT UCERB	Consumer benefit	1,283	1,389	1,496	1,465	1,435	1,404	1,374	1,344	1,397	1,450	1,503	1,556	1,609
WITH UCERB	Consumer benefit	1,324	1,436	1,547	1,512	1,476	1,441	1,405	1,370	1,425	1,479	1,534	1,589	1,643

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