RESIDENTIAL ELECTRICITY PRICE TRENDS REPORT

END-YEAR 2021

STRATEGY AND ECONOMIC ANALYSIS
25 NOVEMBER 2021

AEMC

Purpose of this report

- To estimate future retail electricity price changes and bill outcomes for representative residential consumers in each Australian state and territory. The key components are the electricity consumption of representative consumers, representative retail electricity prices and the electricity supply chain cost components.

- To identify the changes in the energy supply chain cost components that are driving changes in residential electricity prices and bills for each Australian state and territory (excluding the Northern Territory* and Western Australia**), and nationally, from 2020-21 to 2023-24 (the reporting period).

- To explain the principal concepts and calculation methods that have been used to generate the results for the key components.

*Note that this figure does not include Northern Territory – See slide 3 for explanation.
**Note that this figure does not include Western Australia – See slide 4 for explanation

Explanations behind not including Northern Territory

- In previous years prior to 2019, the AEMC used the Territory Generation's bundled wholesale load following price provided by the Department of Treasury and Finance (DTF) to perform the analysis. This price is no longer an accurate representation of wholesale costs in the DKIS due to the entry of independent generators to the Darwin-Katherine Interconnected System (DKIS). As such, publishing this price information would be misleading as an indicator of wholesale electricity prices and could undermine the integrity of future data reporting and analysis.

- Currently all commercial transactions in the Northern Territory's electricity market occur through bilateral contracts between generators and retailers, and information related to these contracts is commercial in confidence. The DTF has informed the AEMC that there does not appear to be any price that can be used for publication without the risk of providing misleading information around the movement of wholesale prices in the DKIS or revealing information that could be detrimental to competition.

Explanations behind not including Western Australia

- This report does not include analysis on Western Australia's electricity prices. Western Australian residential electricity prices are set by the State Government as part of the annual State Budget process.
- The Western Australian Minister for Energy has advised that the Western Australian Government considers a broad range of factors in determining household electricity prices, including the impacts on electricity consumers.
- Given this situation, the WA government considers that the inclusion of Western Australia in the Residential Electricity Price Trends reporting has the potential to create confusion and mislead electricity consumers and the broader industry.

Agenda

Our approach

1. Overview of the approach

Results

2. Trends in national residential electricity prices and bills
3. Key drivers of trends in cost components by jurisdictions

Main assumptions

4. Electricity consumption and prices of representative customers
5. Electricity supply chain cost components

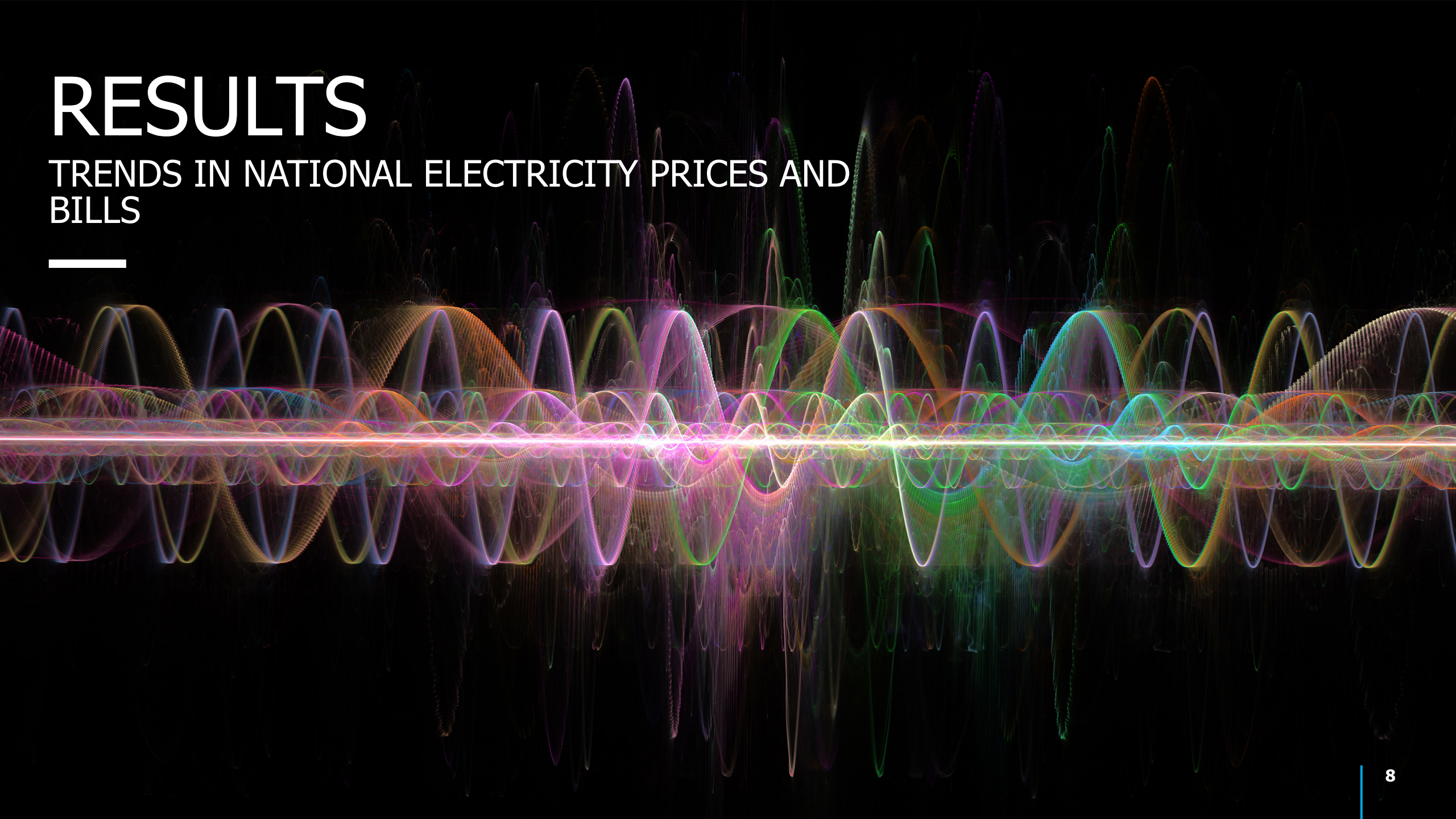
OUR APPROACH

Overview of the approach

- **Representative customer approach –** we have estimated 2021-22 retail bills for representative customers, i.e., for a constructed 'typical' customer with an assumed level of consumption.
- **Retail offers –** we have used retail offers obtained from Energy Made Easy and Victorian Energy Compare to estimate the jurisdictional average bill, weighted by retailer customer numbers.
- **Wholesale costs –** we calculate wholesale electricity purchase costs based on our own market modelling.
- **Environmental costs** are based on the information from the Clean Energy Regulator and jurisdictional data.
- **Regulated network costs** are assumed to change in line with changes in the revenue allowances of TNSPs and DNSPs.
- **All results** are in nominal terms unless specified otherwise.

RESULTS

TRENDS IN NATIONAL ELECTRICITY PRICES AND BILLS

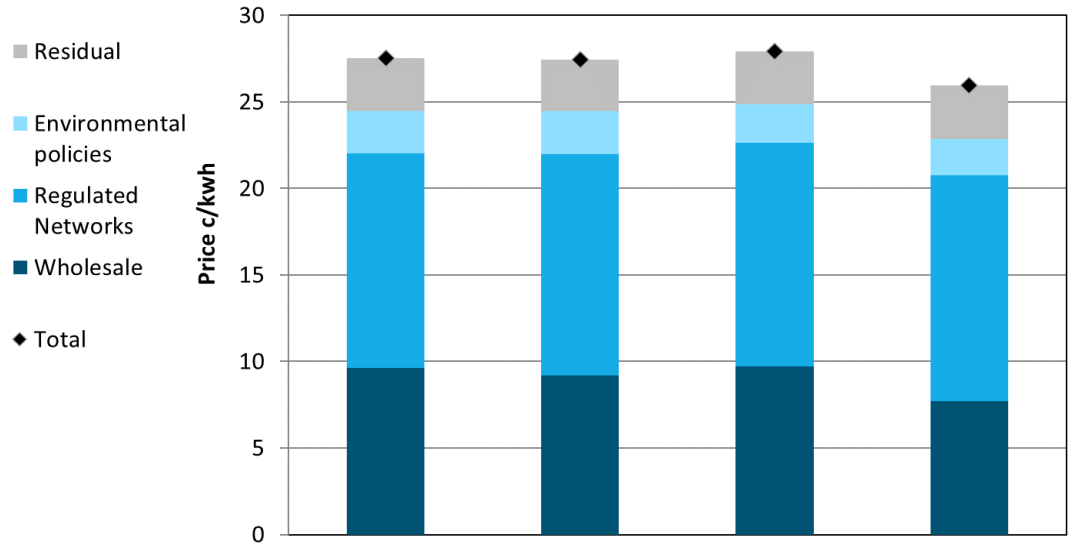


National annual residential bills expected to go down over the reporting period*

6%

$77

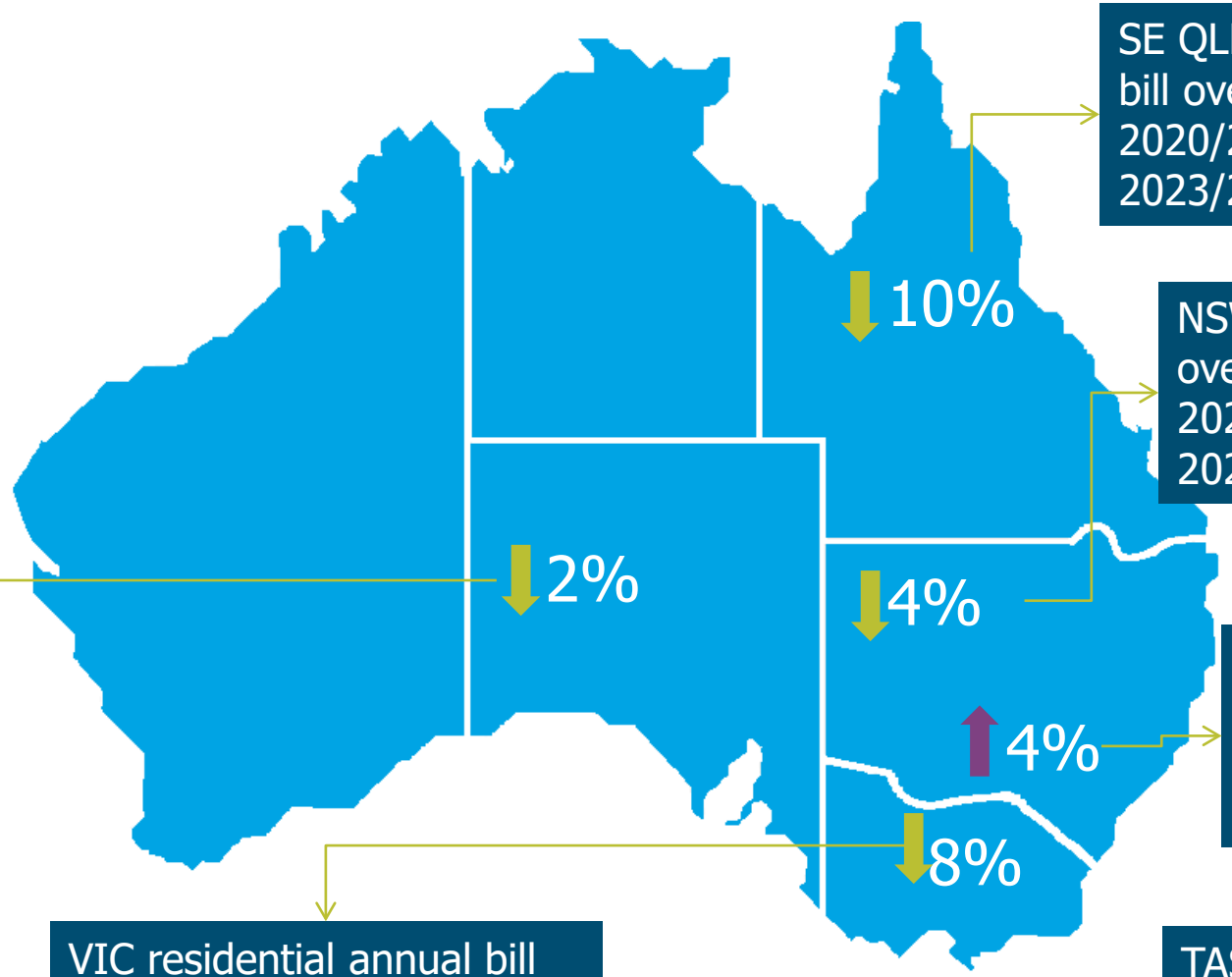
Annual nominal residential bill (weighted by customer numbers) is expected to increase slightly in FY2023 but decrease in FY2024.



	2020/21 Base Year		2021/22 Current Year		2022/23		2023/24	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**2.45**	**$122**	**2.45**	**$123**	**2.24**	**$113**	**2.10**	**$106**
LRET	0.65	$32	0.49	$25	0.37	$19	0.29	$15
SRES	1.00	$50	1.11	$55	0.98	$49	0.93	$46
Jurisdictional Schemes	0.59	$30	0.63	$34	0.62	$33	0.61	$33
Efficiency Schemes	0.21	$10	0.21	$10	0.27	$13	0.28	$13
Regulated Networks	**12.43**	**$603**	**12.81**	**$622**	**12.93**	**$628**	**13.05**	**$634**
Transmission	2.07	$101	2.28	$111	2.34	$114	2.41	$117
Distribution	9.50	$460	9.70	$471	9.75	$473	9.81	$476
Metering	0.85	$42	0.82	$41	0.83	$41	0.84	$41
Wholesale	**9.61**	**$467**	**9.19**	**$448**	**9.71**	**$469**	**7.69**	**$375**
Residual	**3.02**	**$150**	**2.98**	**$145**	**3.03**	**$147**	**3.09**	**$150**
Total	**27.51**	**$1,342**	**27.43**	**$1,338**	**27.92**	**$1,357**	**25.94**	**$1,265**

*Note that this figure does not include Northern Territory and Western Australia

Trends in residential bills by jurisdiction over 3-year period*



SE QLD residential annual bill over reporting period:
2020/21 = $1,226/year
2023/24 = $1,100/year

NSW residential annual bill over reporting period:
2020/21 = $1,253/year
2023/24 = $1,203/year

ACT residential annual bill over reporting period:
2020/21 = $2,004/year
2023/24 = $2,081/year

SA residential annual bill over reporting period:
2020/21 = $1,742/year
2023/24 = $1,707/year

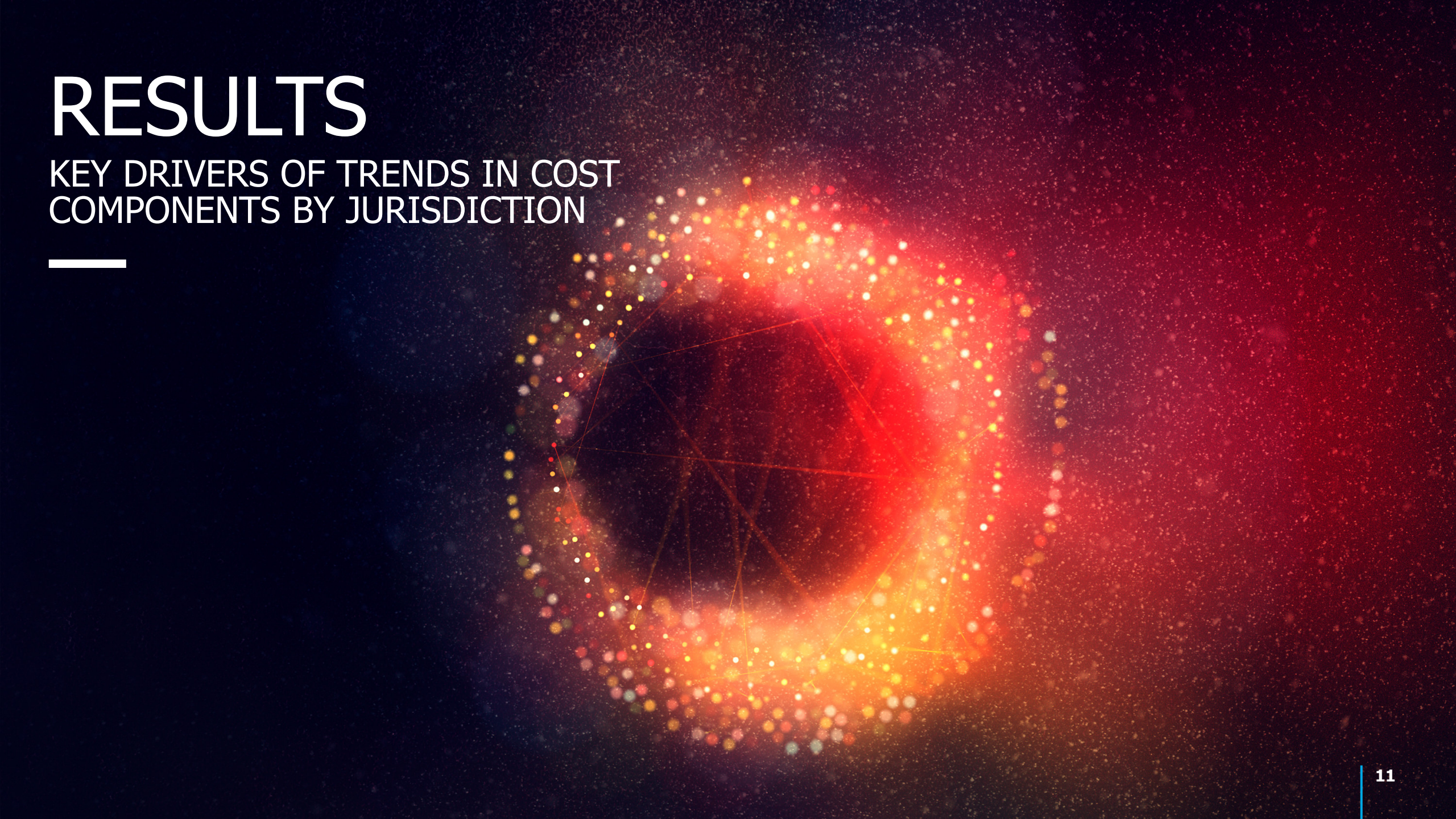
VIC residential annual bill over reporting period:
2020/21 = $1,290/year
2023/24 = $1,191/year

TAS residential annual bill over reporting period:
2020/21 = $2,044/year
2023/24 = $1,920/year

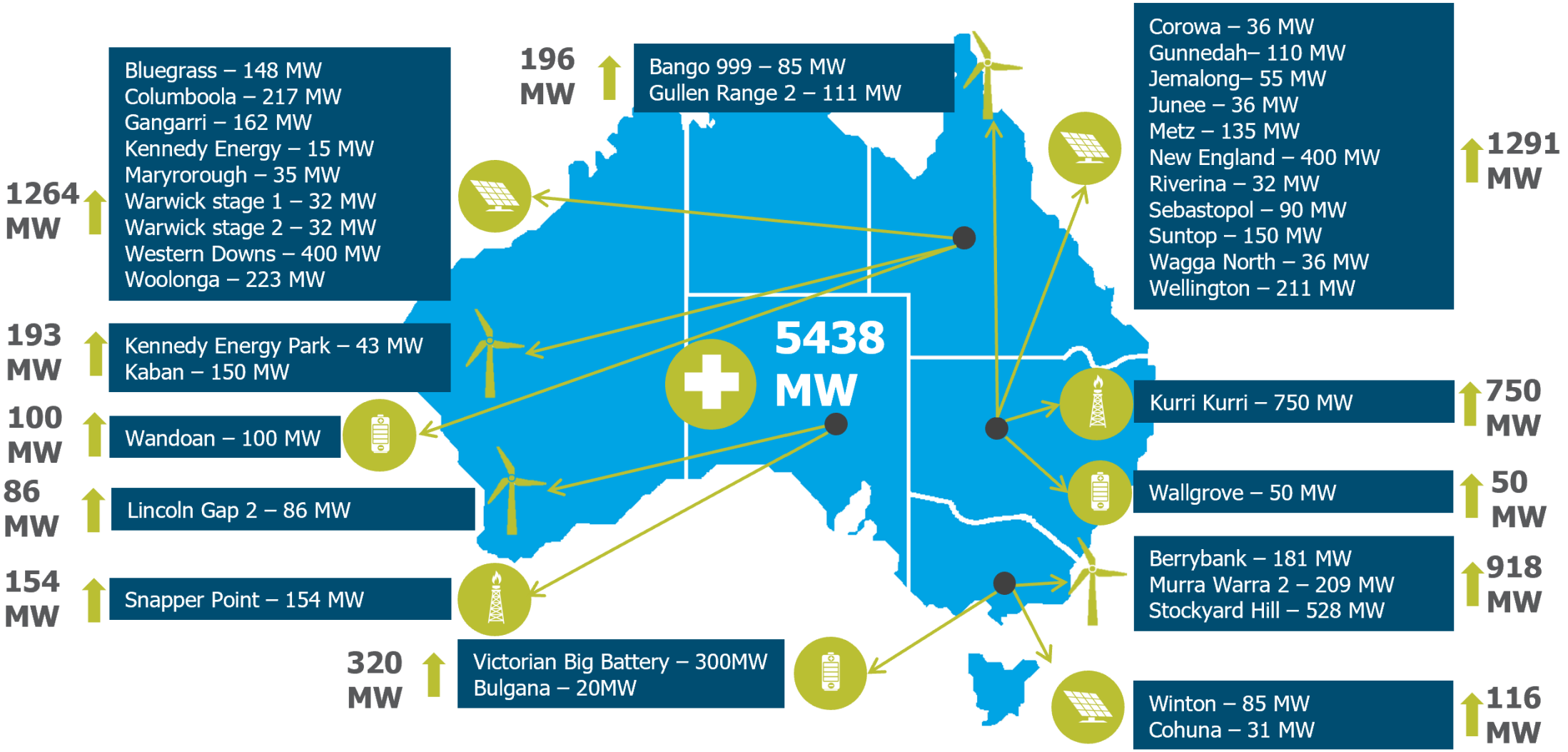
*Note that the representative consumer profile has changed from last years report. See appendix slides 31-32

RESULTS

KEY DRIVERS OF TRENDS IN COST COMPONENTS BY JURISDICTION



Committed projects* - Within price trends horizon

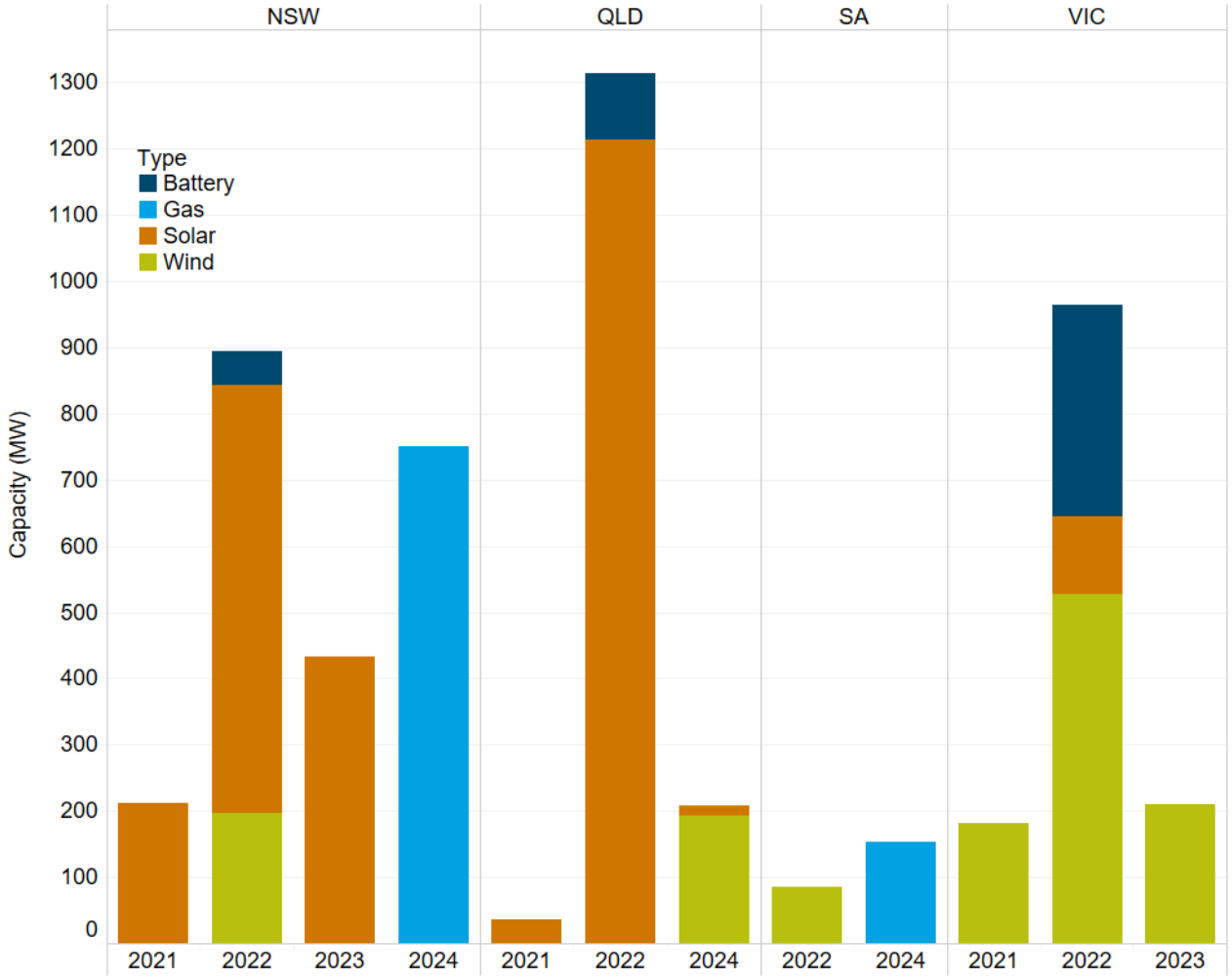


*Source: AEMO ESOO2021

*Note: Committed projects are projects that will proceed, with known timing, satisfying all five of AEMO's commitment criteria in relation to land, contracts, planning, finance and construction.

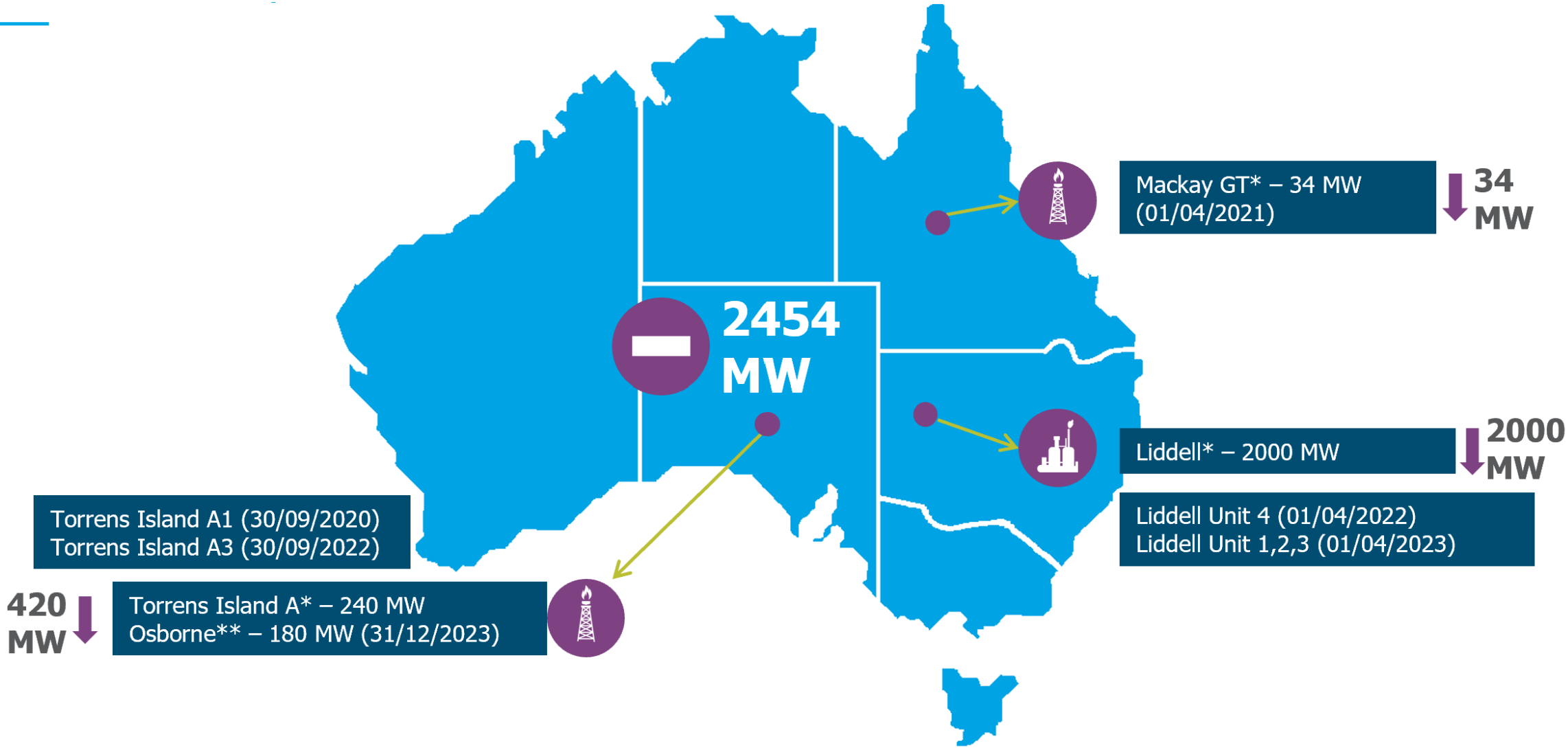
Committed projects capacity by type*

	QLD	NSW	VIC	SA	Total
Wind	193	196	918	86	1393
Solar	1264	1291	116	0	2671
Gas	0	750	0	154	904
Battery	100	50	320	0	470
Total	1557	2287	1354	240	5438



*Note: Committed projects are by financial year

Retirement* - Within price trends horizon



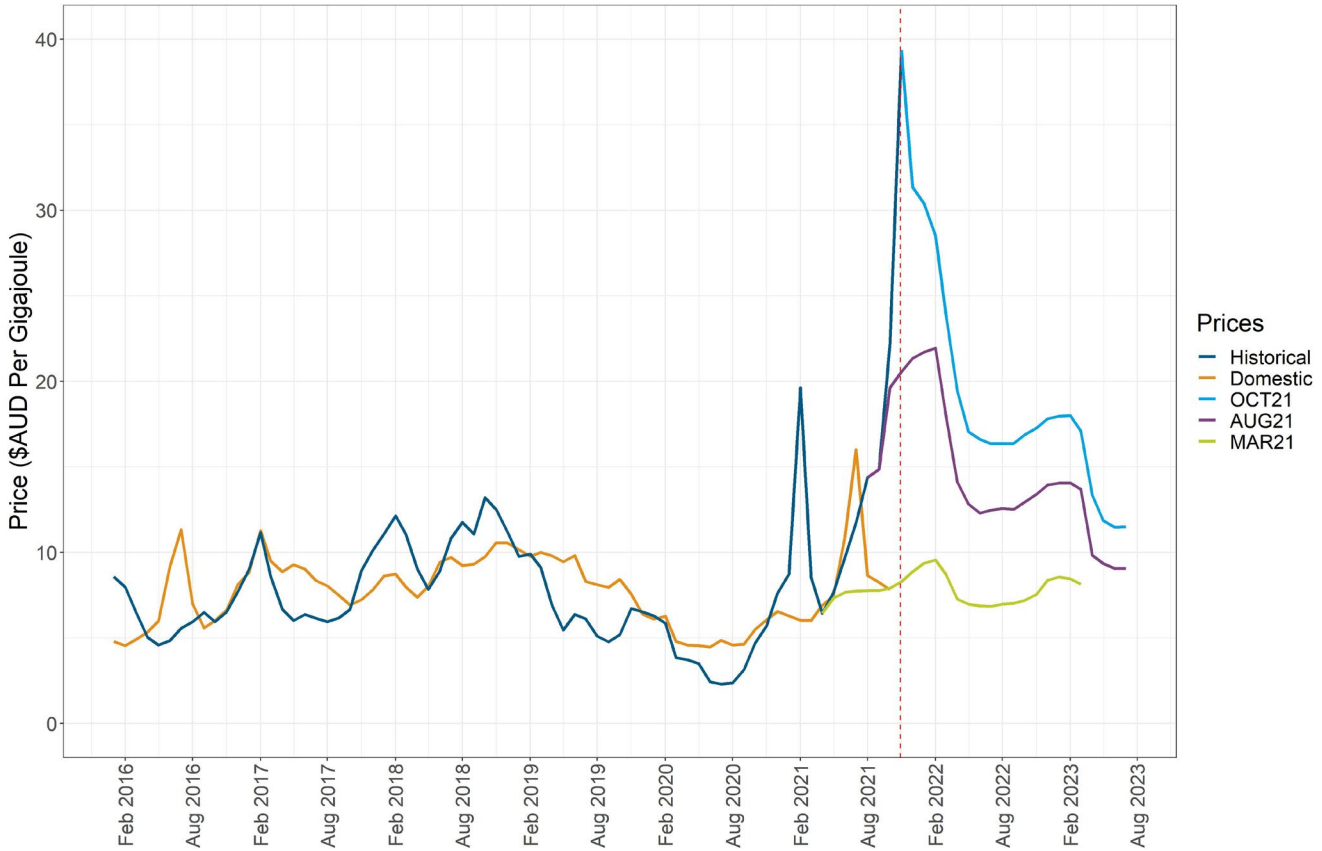
*Source: AEMO ESOO2021

Fuel Prices - higher gas prices driven by rising international benchmarks

ESOO gas price assumptions used in modelling*

	Gas prices ($/GJ) – ESOO2020	Gas prices ($/GJ) – ESOO2021
2020-21	9.52	10.23
2021-22	9.05 (5.0% decrease)	10.91 (6.7% increase)
2022-23	9.56 (5.7% increase)	10.99 (0.7% increase)
2023-24	9.70 (1.4% increase)	11.09 (0.8% increase)

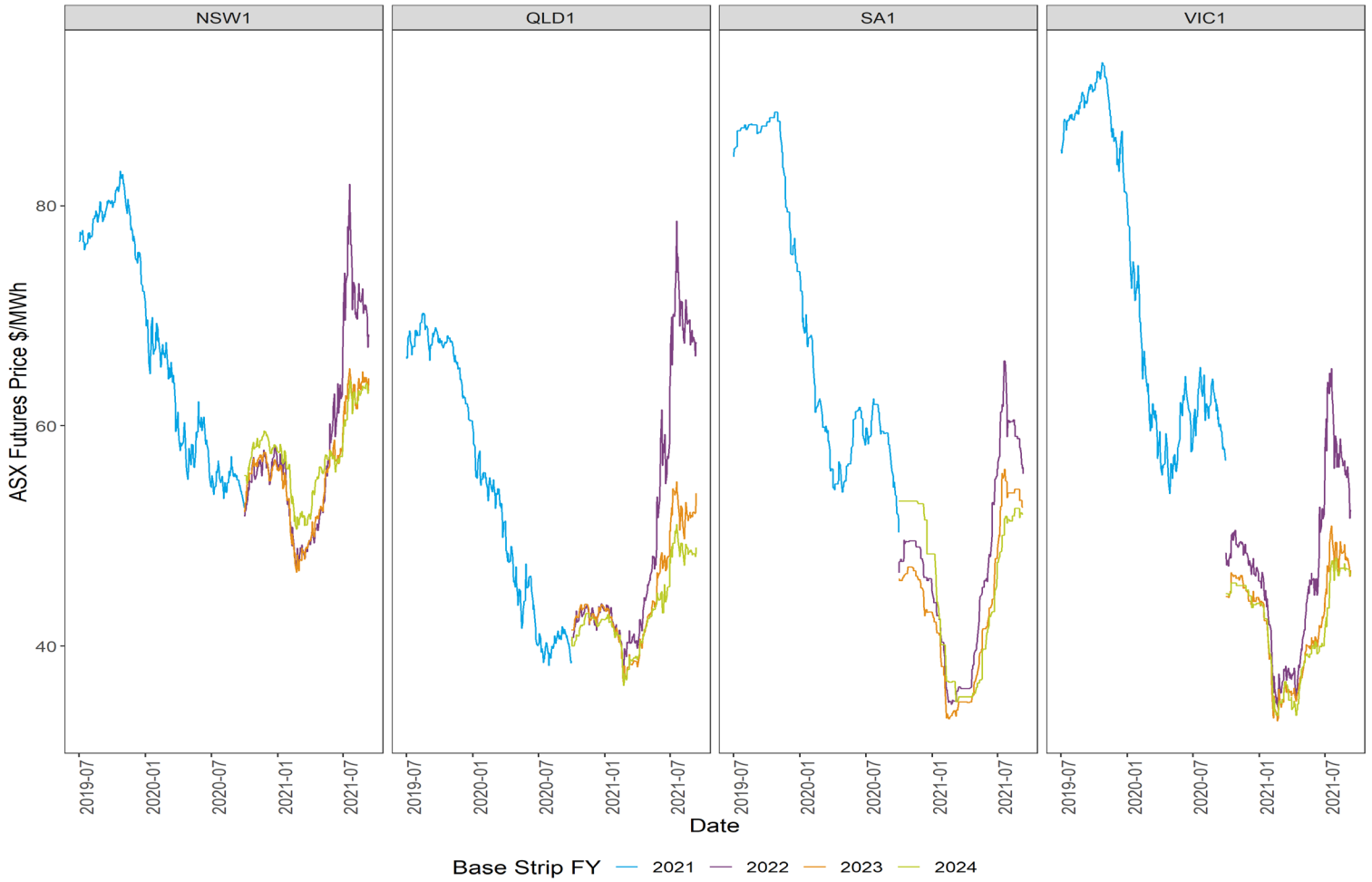
ACCC LNG netback benchmark and domestic gas spot prices**



*ESOO2020 and ESOO2021

**Domestic prices based on STTM unweighted Sydney, Adelaide and Brisbane prices. Latest netback Forward prices as at 29th October 2021

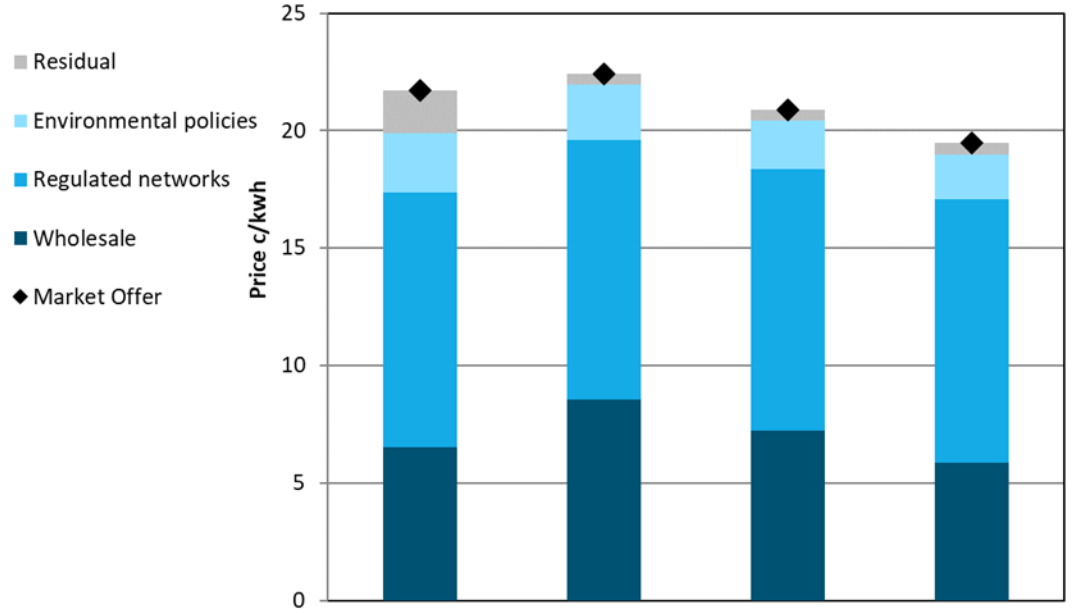
Contract prices*



*Note that the contracts for 2023 and 2024 have relatively low liquidity, i.e., there are few trades on which these prices are based.

Trends in QLD supply chain components

- Wholesale costs are expected to go down by 10 per cent (or $36) over reporting period.
- Regulated network costs* are expected to go up by 3 per cent (or $21) due to slight increase in both transmission and distribution costs.
- Environmental costs are expected to go down by 25 per cent (or $35) over reporting period due to the LRET's certificate spot prices decreasing.
- Annual residential bill is expected to decrease by 10 per cent (or $126) over reporting period, driven by decrease in environmental costs and wholesale costs.

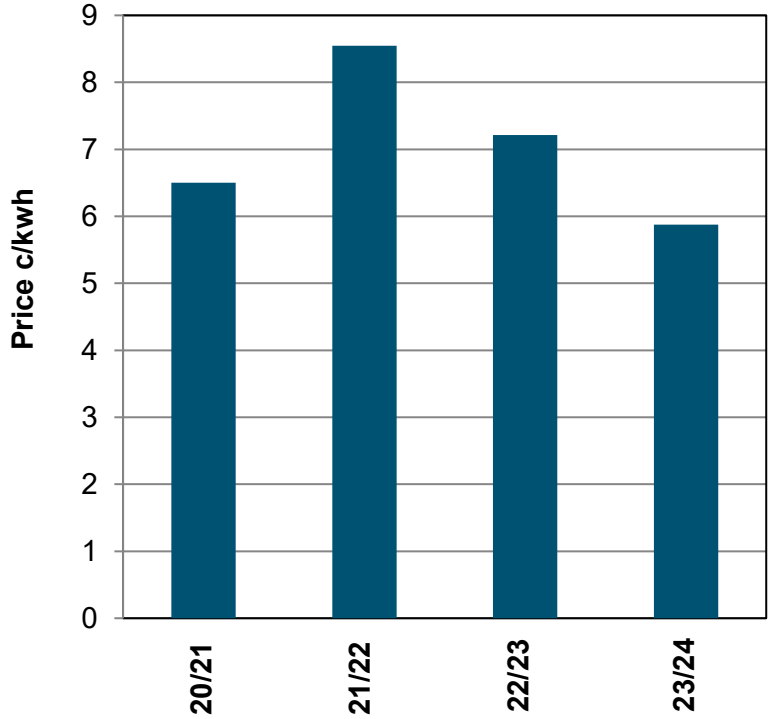


	2020/21 Base Year		2021/22 Current Year		2022/23		2023/24	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**2.53**	**$143**	**2.38**	**$135**	**2.09**	**$118**	**1.91**	**$108**
LRET - LGC cost	0.65	$37	0.49	$27	0.36	$20	0.27	$15
SRES - STC cost	1.00	$57	1.11	$63	0.98	$55	0.92	$52
Solar Bonus Scheme	0.88	$50	0.79	$45	0.75	$42	0.71	$40
Regulated networks	**10.84**	**$613**	**11.04**	**$624**	**11.13**	**$629**	**11.22**	**$634**
Transmission	1.80	$102	1.92	$108	1.93	$109	1.94	$110
Distribution	8.18	$462	8.25	$466	8.31	$469	8.36	$472
ACS Metering	0.86	$49	0.87	$49	0.89	$50	0.91	$51
Wholesale	**6.50**	**$367**	**8.55**	**$483**	**7.21**	**$407**	**5.87**	**$332**
Residual	**1.81**	**$102**	**0.45**	**$25**	**0.46**	**$26**	**0.46**	**$26**
Market Offer	**21.69**	**$1,226**	**22.42**	**$1,266**	**20.88**	**$1,180**	**19.46**	**$1,100**

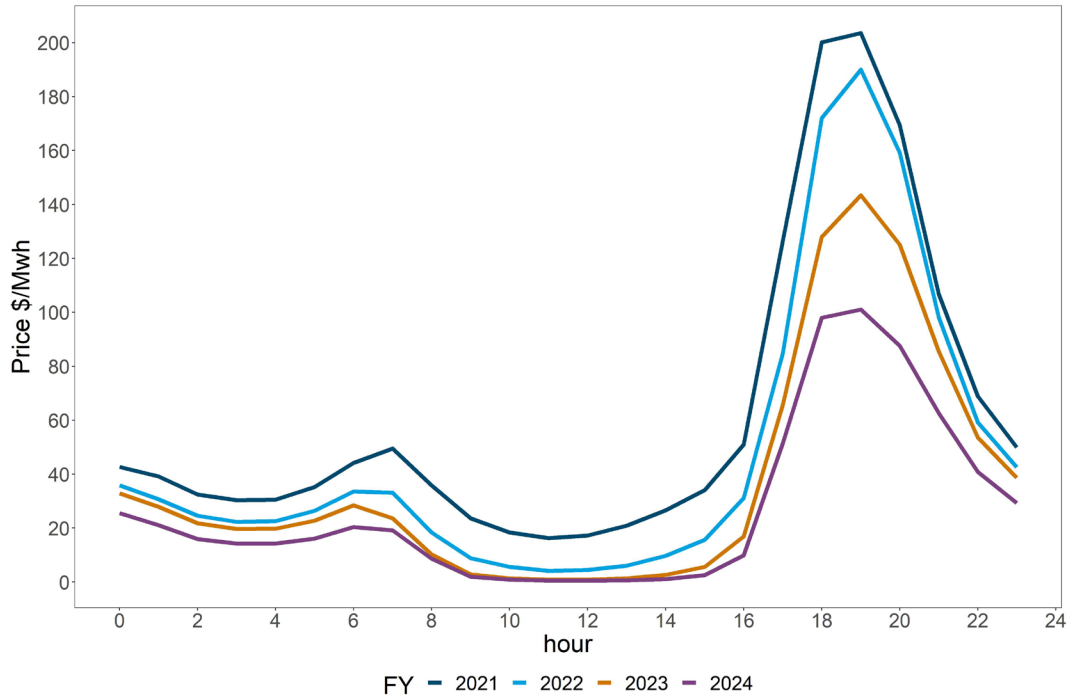
* The regulated network tariffs in 2020-21 and 2021-22 come from AER annual pricing proposals and in 2022-23 and 2023-24 come from AER final distribution determinations.

Queensland modelled hourly wholesale price

Wholesale costs to consumers



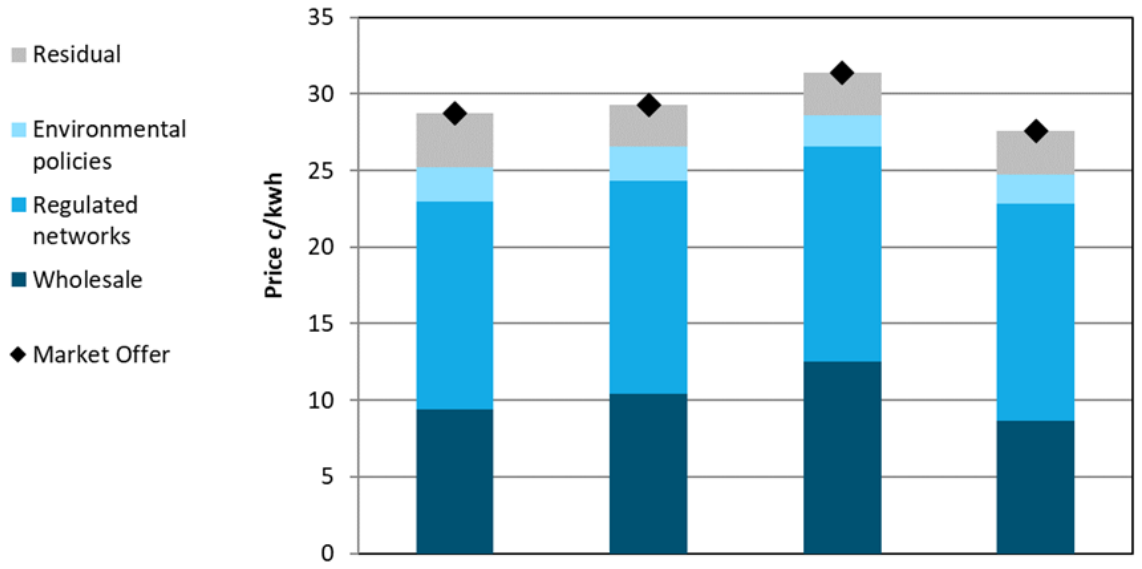
Modelled spot price daily profile



- The wholesale costs to consumers, which includes retailer contracting in advance of the contract year, are increasing in FY22 due to higher gas prices and fuel costs in 2021.
- The reduction in wholesale costs to consumers from FY23 onwards is due to the large increase of new solar (1264 MW) and wind (193MW) capacity.
- Modelled spot prices in Queensland are falling across every period in the day over the price trends horizon.

Trends in NSW supply chain components

- Wholesale costs are expected to go down by 8 per cent (or $32) over the reporting period.
- Regulated network costs* are expected to increase by 5 per cent (or $28) over the reporting period due to increase in transmission cost.
- Environmental costs are expected to go down by 18 per cent (or $18) over the reporting driven by the LRET cost.
- Annual residential bill is expected to decrease by 4 per cent (or $50) over the reporting period.

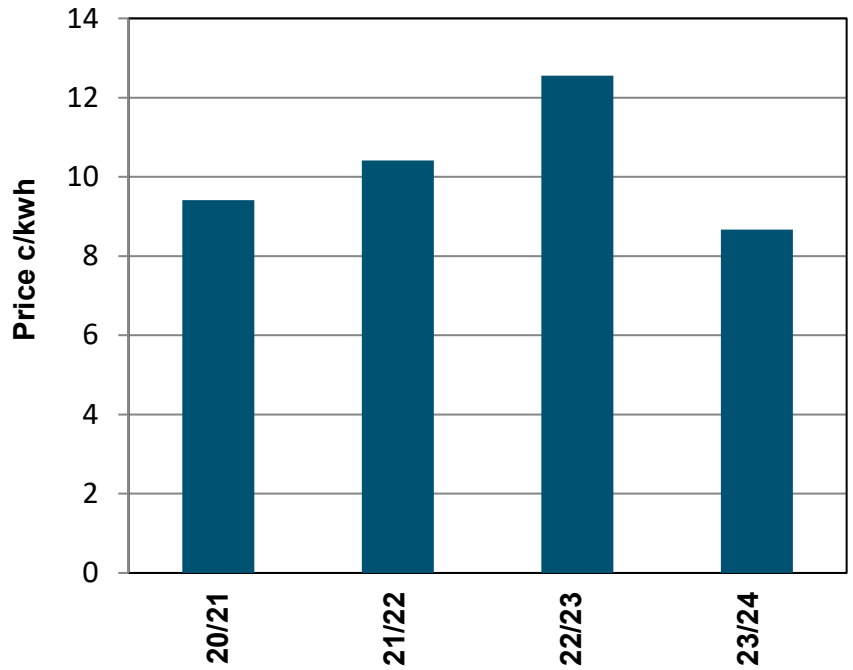


	2020/21 Base Year		2021/22 Current Year		2022/23		2023/24	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**2.28**	**$100**	**2.24**	**$98**	**2.01**	**$87**	**1.88**	**$82**
LRET - LGC cost	0.65	$28	0.48	$21	0.35	$15	0.27	$12
SRES - STC cost	0.99	$43	1.10	$48	0.97	$42	0.92	$40
Climate Change Fund	0.38	$17	0.40	$17	0.40	$18	0.40	$18
Energy Saving Scheme	0.26	$11	0.26	$11	0.28	$12	0.29	$13
Regulated networks	**13.54**	**$591**	**13.88**	**$606**	**14.03**	**$612**	**14.18**	**$619**
Transmission	2.43	$106	2.68	$117	2.79	$122	2.91	$127
Distribution	10.50	$458	10.58	$461	10.63	$464	10.69	$466
ACS Metering	0.62	$27	0.63	$27	0.60	$26	0.59	$26
Wholesale	**9.41**	**$410**	**10.42**	**$454**	**12.55**	**$548**	**8.67**	**$378**
Residual	**3.48**	**$152**	**2.74**	**$120**	**2.79**	**$122**	**2.85**	**$124**
Market Offer	**28.72**	**$1,253**	**29.28**	**$1,277**	**31.38**	**$1,369**	**27.57**	**$1,203**

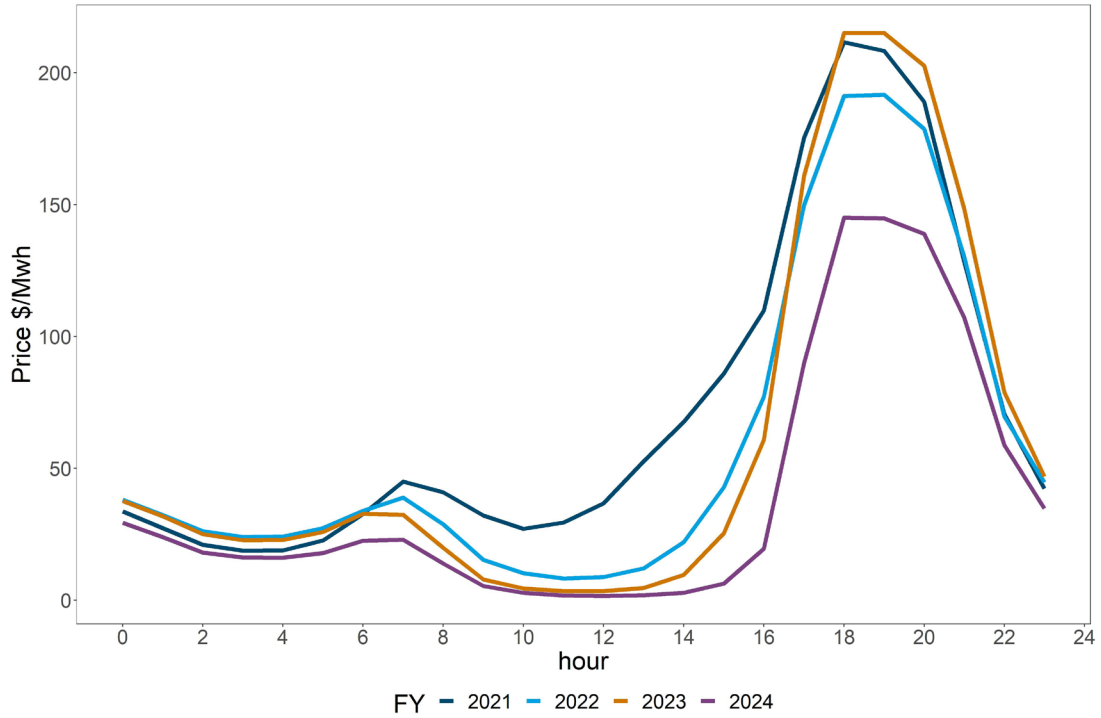
* The regulated network tariffs in 2020-21 and 2021-22 come from AER annual pricing proposals and in 2022-23 and 2023-24 come from AER final determinations.

NSW modelled hourly wholesale price

Wholesale costs to consumers



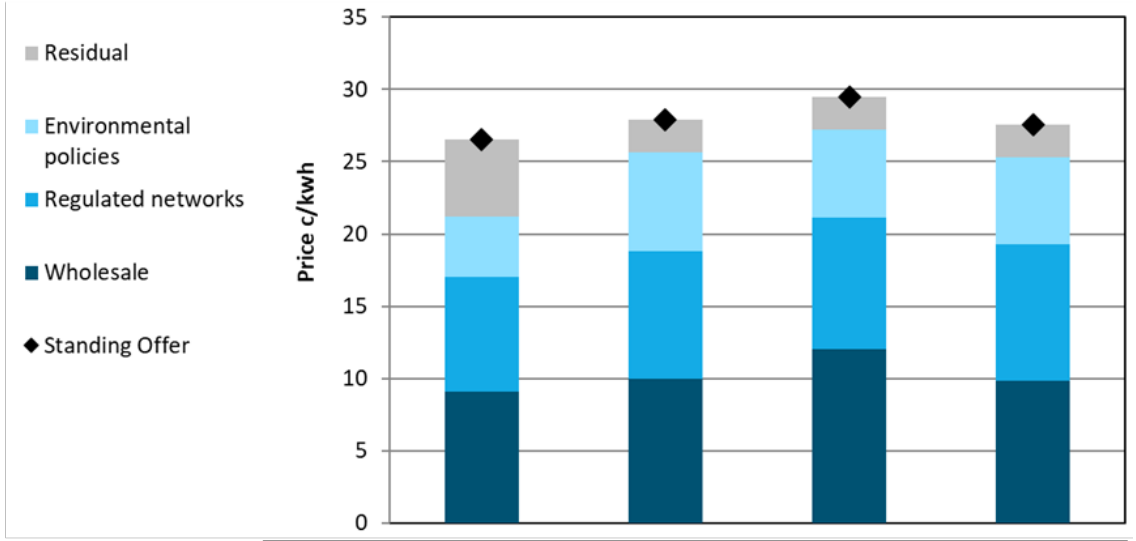
Modelled spot price daily profile



- The wholesale costs to consumers, which includes retailer contracting in advance of the contract year, sees wholesale costs in FY22 increasing due to higher gas prices and fuel costs in 2021.
- Wholesale costs in FY23 are increasing due to the Liddell closure in 2022 and 2023. The reduction in wholesale costs in FY24 is due to increases in generation capacity in NSW in 2023 and 2024.
- Modelled spot prices in NSW are falling in the middle of the day with increased solar. During peak periods prices increase in FY23 before falling again in FY24.

Trends in ACT supply chain components

- Wholesale costs are expected to go up by 8 per cent ($55) over the reporting period.
- Regulated network costs* are expected to increase by 19 per cent (or $112) over the reporting period due partly to previous under-recoveries, higher operating expenditure and an increase in transmission cost.
- Environmental costs are expected to go up by 44 per cent (or $138) over the reporting period due to a large increase in Feed-in Tariff cost from FY2022.
- Annual residential bill is only expected to increase by 4 per cent (or $77) due to the fall in the residual component in the current year.

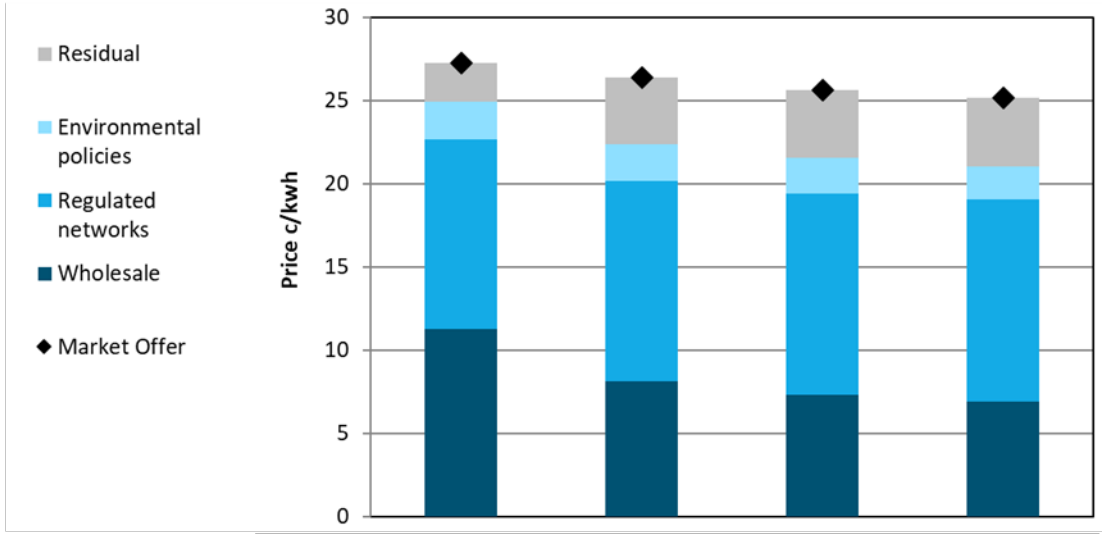


	2020/21 Base Year		2021/22 Current Year		2022/23		2023/24	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**4.18**	**$315**	**6.85**	**$517**	**6.09**	**$459**	**6.01**	**$454**
LRET - LGC cost	0.66	$50	0.49	$37	0.36	$27	0.27	$20
SRES - STC cost	1.02	$77	1.13	$85	1.00	$76	0.94	$71
Feed-in Tariff Schemes	2.11	$159	4.92	$371	4.41	$332	4.48	$338
EEIS	0.39	$29	0.32	$24	0.32	$24	0.32	$24
Regulated networks	**7.94**	**$599**	**8.84**	**$667**	**9.13**	**$689**	**9.43**	**$711**
Transmission	1.61	$121	1.90	$143	1.98	$150	2.07	$156
Distribution	5.66	$427	6.27	$473	6.46	$488	6.66	$503
ACS Metering	0.66	$50	0.67	$50	0.68	$51	0.69	$52
Wholesale	**9.12**	**$688**	**9.97**	**$752**	**12.03**	**$908**	**9.85**	**$743**
Residual	**5.33**	**$402**	**2.21**	**$167**	**2.25**	**$170**	**2.29**	**$173**
Standing Offer	**26.56**	**$2,004**	**27.87**	**$2,103**	**29.50**	**$2,226**	**27.58**	**$2,081**

* The regulated network tariffs in 2020-21 and 2021-22 come from AER annual pricing proposals and in 2022-23 and 2023-24 come from AER final determinations. Also note that the FiT schemes' forecasts are provided by the ACT government.

Trends in VIC supply chain components

- Wholesale costs are expected to go down by 39 per cent (or $207) over the reporting period.
- Regulated network costs* are expected to increase by 7 per cent (or $36) over the reporting period due to higher distribution costs in FY2022.
- Environmental costs are expected to go down by 11 per cent (or $12) over the reporting period driven by the LRET cost.
- Annual residential bill is expected to decrease by 8 per cent (or $99) over the reporting period.

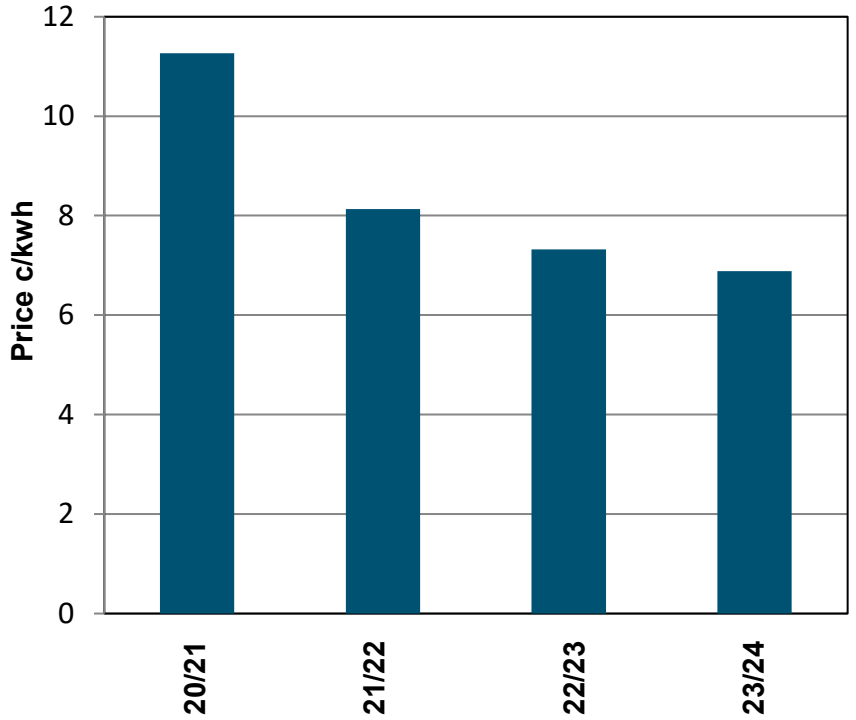


	2020/21 Base Year		2021/22 Current Year		2022/23		2023/24	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**2.26**	**$107**	**2.22**	**$105**	**2.15**	**$101**	**2.01**	**$95**
LRET - LGC cost	0.64	$30	0.48	$23	0.35	$17	0.27	$13
SRES - STC cost	0.99	$47	1.10	$52	0.97	$46	0.92	$43
Feed-in Tariff Schemes	0.37	$18	0.37	$18	0.37	$18	0.38	$18
VEU	0.26	$12	0.27	$13	0.45	$21	0.45	$21
Regulated networks	**11.38**	**$538**	**12.03**	**$568**	**12.09**	**$571**	**12.15**	**$574**
Transmission	1.43	$67	1.68	$79	1.68	$79	1.67	$79
Distribution	8.66	$409	9.17	$433	9.20	$435	9.23	$436
ACS Metering	1.29	$61	1.18	$56	1.21	$57	1.24	$59
Wholesale	**11.26**	**$532**	**8.13**	**$384**	**7.32**	**$346**	**6.89**	**$325**
Residual	**2.38**	**$112**	**3.99**	**$188**	**4.06**	**$192**	**4.14**	**$196**
Market Offer	**27.29**	**$1,290**	**26.37**	**$1,246**	**25.62**	**$1,211**	**25.19**	**$1,191**

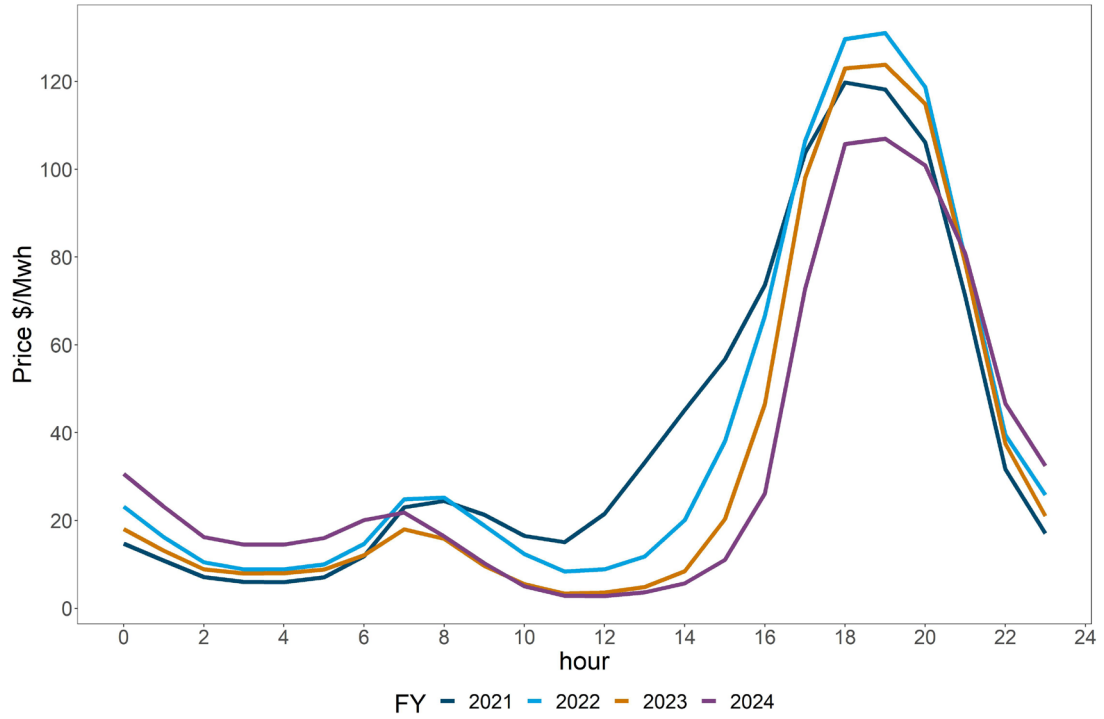
* The regulated network tariffs in 2020-20 and 2021-22 come from AER annual pricing proposals and in 2022-23 and 2023-24 come from AER final determinations.

VIC modelled hourly wholesale price

Wholesale costs to consumers



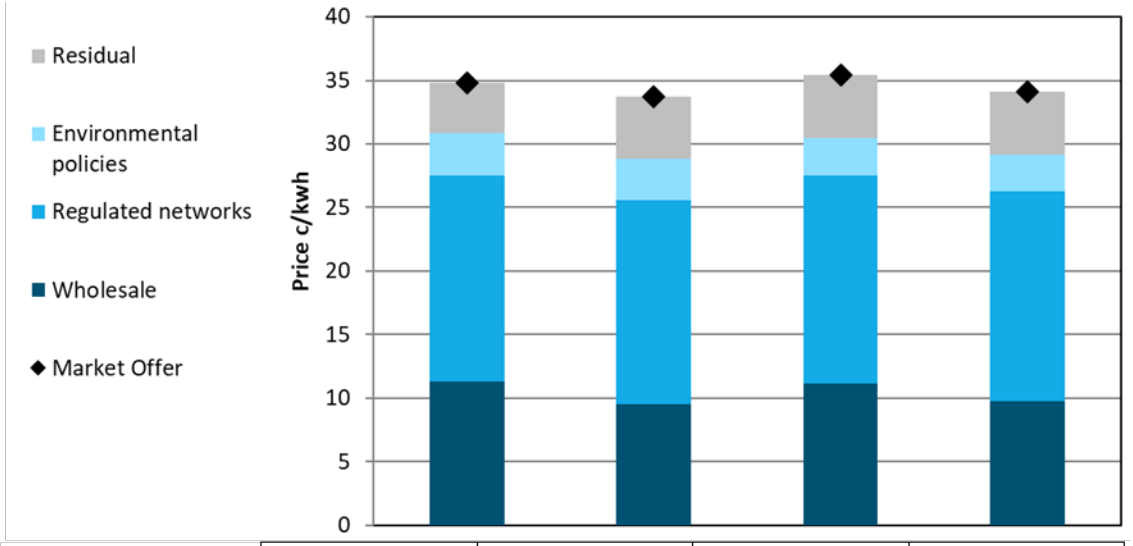
Modelled spot price daily profile



- The wholesale costs to consumers, which includes retailer contracting in advance of the contract year, sees wholesale costs decreasing in FY22, FY23 and FY24 as new renewable capacity comes online.
- Modelled spot prices in VIC are falling over the price trends horizon.

Trends in SA supply chain components

- Wholesale costs are expected to go down by 14 per cent (or $79) over the reporting period.
- Regulated network costs* are expected to increase by 2 per cent (or $18) over the reporting period due to higher return on capital.
- Environmental costs are expected to go down by 15 per cent (or $26) over the reporting period due to the LRET cost.
- Annual residential bill is expected to down by 2 per cent (or $35) over the reporting period.

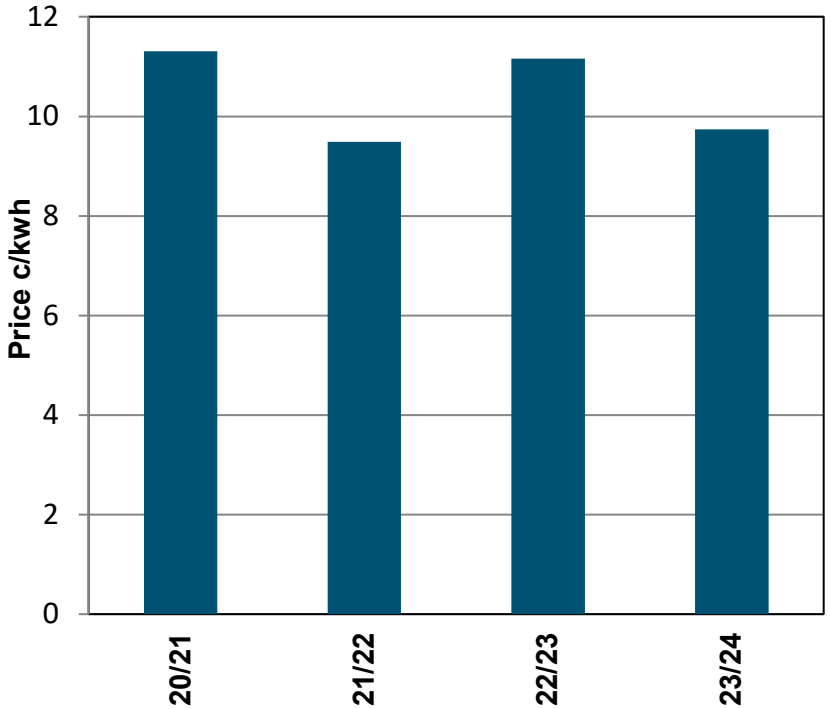


	2020/21 Base Year		2021/22 Current Year		2022/23		2023/24	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**3.38**	**$169**	**3.27**	**$163**	**3.01**	**$150**	**2.86**	**$143**
LRET - LGC cost	0.68	$34	0.51	$25	0.37	$19	0.28	$14
SRES - STC cost	0.99	$50	1.10	$55	0.97	$49	0.92	$46
Feed-in Tariff Schemes	1.46	$73	1.41	$71	1.41	$71	1.41	$71
REES/REPS	0.25	$13	0.25	$13	0.25	$13	0.25	$13
Regulated networks	**16.18**	**$809**	**16.11**	**$806**	**16.33**	**$816**	**16.55**	**$827**
Transmission	3.39	$170	3.56	$178	3.72	$186	3.88	$194
Distribution	12.33	$617	12.09	$605	12.14	$607	12.20	$610
ACS Metering	0.46	$23	0.46	$23	0.46	$23	0.46	$23
Wholesale	**11.31**	**$566**	**9.49**	**$475**	**11.16**	**$558**	**9.74**	**$487**
Residual	**3.97**	**$199**	**4.81**	**$241**	**4.91**	**$245**	**5.00**	**$250**
Market Offer	**34.84**	**$1,742**	**33.68**	**$1,684**	**35.40**	**$1,770**	**34.14**	**$1,707**

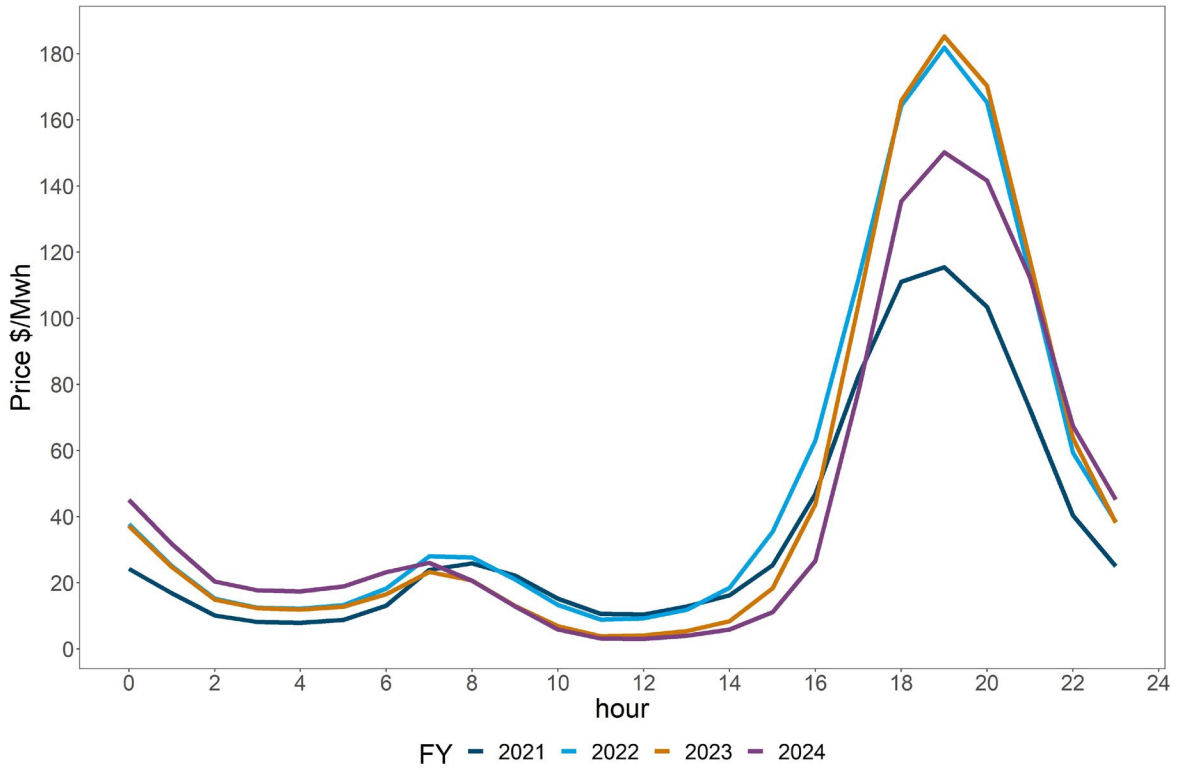
* The regulated network tariffs in 2020-21 and 2021-22 come from AER annual pricing proposals and in 2022-23 and 2023-24 come from AER draft distribution determinations.

SA modelled hourly wholesale price

Wholesale costs to consumers



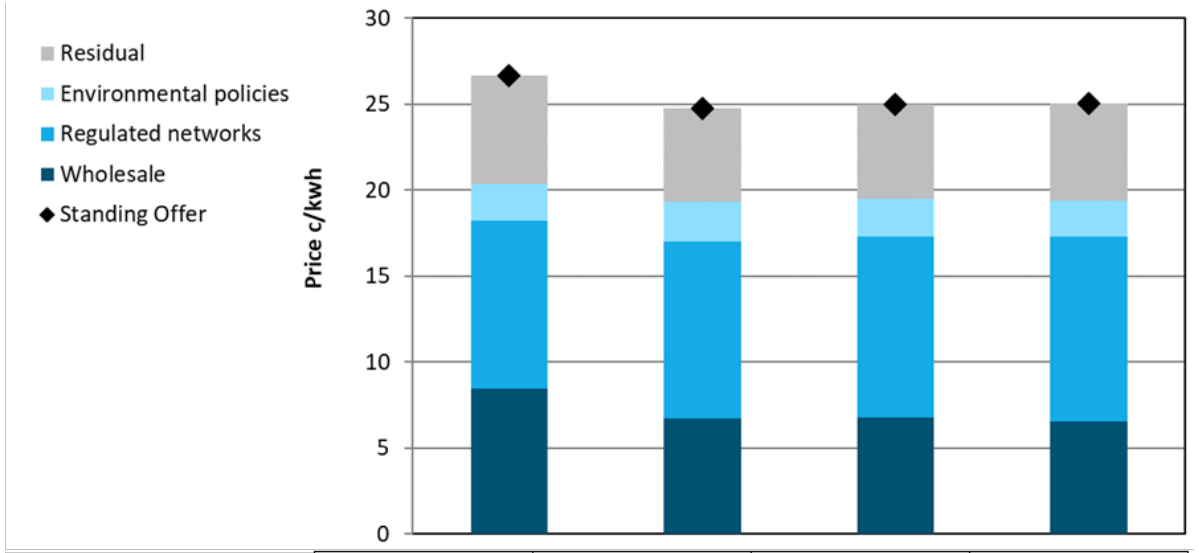
Modelled spot price daily profile



- The wholesale costs to consumers, which includes retailer contracting in advance of the contract year, sees wholesale costs in FY23 increasing due to the closure of Torrens Island A3 (2022).
- Modelled spot prices in SA are rising in peak periods in FY22, falling in off peak periods in FY 23 and falling across the day in FY24.

Trends in TAS supply chain components

- Wholesale costs are expected to go down by 22 per cent (or $146) over the reporting period.
- Regulated network costs* are expected to increase by 10 per cent (or $72) over the reporting period, driven by higher distribution costs.
- Environmental costs are expected to go down by 2 per cent (or $3) over the reporting period.
- Annual residential bill is expected to decrease by 6 per cent (or $125) over the reporting period, driven by wholesale and environmental costs.



	2020/21 Base Year		2021/22 Current Year		2022/23		2023/24	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**2.15**	**$164**	**2.31**	**$177**	**2.16**	**$165**	**2.10**	**$161**
LRET - LGC cost	0.84	$65	0.86	$66	0.88	$68	0.90	$69
SRES - STC cost	1.30	$100	1.44	$111	1.28	$98	1.20	$92
Regulated networks	**9.77**	**$749**	**10.31**	**$790**	**10.51**	**$806**	**10.71**	**$821**
Transmission	2.02	$155	1.95	$149	2.00	$153	2.04	$157
Distribution	7.12	$546	7.72	$592	7.88	$604	8.03	$616
ACS Metering	0.63	$48	0.64	$49	0.64	$49	0.64	$49
Wholesale	**8.48**	**$650**	**6.72**	**$515**	**6.81**	**$522**	**6.58**	**$505**
Residual	**6.27**	**$481**	**5.43**	**$416**	**5.54**	**$425**	**5.64**	**$433**
Standing Offer	**26.67**	**$2,044**	**24.77**	**$1,899**	**25.02**	**$1,918**	**25.04**	**$1,920**

* The regulated network tariffs in 2020-21 and 2021-22 come from AER from annual pricing proposals and in 2022-23 and 2023-24 come from TasNetworks.

Limitations

- **Spot price modelling:**
  - Our spot price modelling assumes bidding behaviour mirrors historical bid profiles. We have calibrated bids so that our modelled spot prices align with current futures prices.
  - Nevertheless, the shape of our modelled prices – i.e., *when* high prices occur – is driven by historical bid profiles. Bidding behaviour may of course change, and this would affect our results.
- **Network costs:**
  - Our analysis considers relevant information from the latest available network revenue determinations including determinations on contingent project applications published by the AER, which include the latest decisions on ElectraNet and TransGrid's contingent project applications for Project EnergyConnect. Final determinations may differ from the assumptions we have included in this modelling.
- **Retail offers:**
  - We have assumed that the residual component of the bill, which is derived from the difference between September 2021 retail offers and the sum of the other cost components, remains constant in real terms. Note that retail offers for Tasmania for 2021-22 are based on the Aurora Energy's approved standing offers prices from 1 July 2021.
  - In reality, the retail margin and retail costs may change over time, and this would affect our results.

Estimated national prices on year ahead

National average prices and costs	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Source of estimated prices and costs	2013 report	2014 report	2015 report	2016 report	2016 report	2017 report	2018 report	2019 report	2020 report
Source of actual prices and costs	2014 report	2015 report	2016 report	2017 report	2018 report	2018 report	2019 report**	2020 report^	2021 report^
Total retail price									
Estimated price	28	27	25	26	26	30	29	28	26
Estimated price change		-1	-2	1	1	3	-1	0	-2
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase	Decrease	Decrease	Decrease
Actual price	29	26	25	28	30	30	30	28	27
Actual price change		-3	-1	3	2	0	1	-3	0
Actual direction of trend		Decrease	Decrease	Increase	Increase	Decrease	Increase	Decrease	Decrease
Network costs									
Estimated price	14	14	12	12	12	14	13	13	13
Estimated price change		0	-2	0	0	1	0	-1	0
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase	Decrease	Decrease	Decrease
Actual price	14	13	12	14	13	13	13	13	13
Actual price change		-1	-1	1	0	0	0	-1	0
Actual direction of trend		Decrease	Decrease	Increase	Decrease	Increase	Decrease	Decrease	Increase
Wholesale costs*									
Estimated price	5	10	11	7	8	11	10	11	8
Estimated price change		5	1	-4	1	3	-1	1	-3
Estimated direction of trend		Increase	Increase	Decrease	Increase	Increase	Decrease	Increase	Decrease
Actual price	10	11	10	10	12	12	12	9	9
Actual price change		0	0	0	2	0	0	-3	0
Actual direction of trend		Increase	Decrease	Decrease	Increase	Increase	Increase	Decrease	Decrease
Environmental costs									
Estimated price	4	2	2	2	2	2	2	2	2
Estimated price change		-2	0	0	0	0	0	0	1
Estimated direction of trend		Decrease	Decrease	Increase	Decrease	Decrease	Increase	Decrease	Increase
Actual price	4	2	2	2	2	2	2	2	2
Actual price change		-3	0	0	0	0	0	0	0
Actual direction of trend		Decrease	Increase	Decrease	Decrease	Increase	Decrease	Increase	Increase

Source: AEMC 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020 Residential Electricity Price Trends reports.
Note: * For 2014-15 and 2015-16, expected and actual wholesale and retail costs were combined and presented as 'competitive market costs'. For 2016-17, 2017-18, 2018-19, 2019-20 and 2020-21 the comparison of actual and expected results are for wholesale costs only. For the final prices the numbers include the residual component and are subject to rounding.
** For 2019 report, the figures are estimated by excluding Northern Territory.
^ For the 2020 and 2021 report, the figures are estimated by excluding Northern Territory and Western Australia.

MAIN ASSUMPTIONS

ELECTRICITY CONSUMPTION AND PRICES OF REPRESENTATIVE CUSTOMERS

Electricity consumption of representative customers

- Representative customers are defined by their electricity consumption characteristics, which are their total annual electricity consumption measured in kWh and how this consumption varies through the year, on a quarterly basis.
- Data provided by the AER from their 2020 Electricity Bill Benchmarks are used to estimate the annual consumption value and quarterly breakdown for most jurisdictions.
- Equivalent values to the AER are provided by jurisdictions in South Australia and Tasmania
- The AER benchmark values are based on a survey of around 8,000 households where participants are asked about their homes and the way in which they use electricity.
- The consumption benchmarks have been updated from the 2020 price trends report which used Data provided by the AER in their 2017 Electricity Bill Benchmarks report

The same consumption levels have been used for the whole reporting period

Table 1: Annual consumption of representative consumer – based on AER benchmark values

JURISDICTION	MOST COMMON HOUSEHOLD TYPES	TOTAL ANNUAL CONSUMPTION (KWH) PT2020	TOTAL ANNUAL CONSUMPTION (KWH) PT2021
Queensland	2-3 person household, no mains gas, no solar PV, no swimming pool, controlled load and on a market offer	5,240	5,650
New South Wales	2-3 person household, mains gas, air conditioning, no controlled load, no swimming pool and on a market offer	4,215	4,362
Australian Capital Territory	2-3 person household, mains gas, electricity water heating, electric water heating and on the regulated standing offer	7,151	7,545
Victoria	2-3 person household, mains gas, no controlled load, no swimming pool, electric space heating and on market offer	3,865	4,727

Source: AER

The same consumption levels have been used for the whole reporting period

Table 2: Annual consumption of representative consumer – provided by jurisdictional government

JURISDICTION	MOST COMMON HOUSEHOLD TYPES	TOTAL ANNUAL CONSUMPTION (KWH) PT2020	TOTAL ANNUAL CONSUMPTION (KWH) PT2021
South Australia	2 person household, mains gas and on a market offer	5,000	5,000

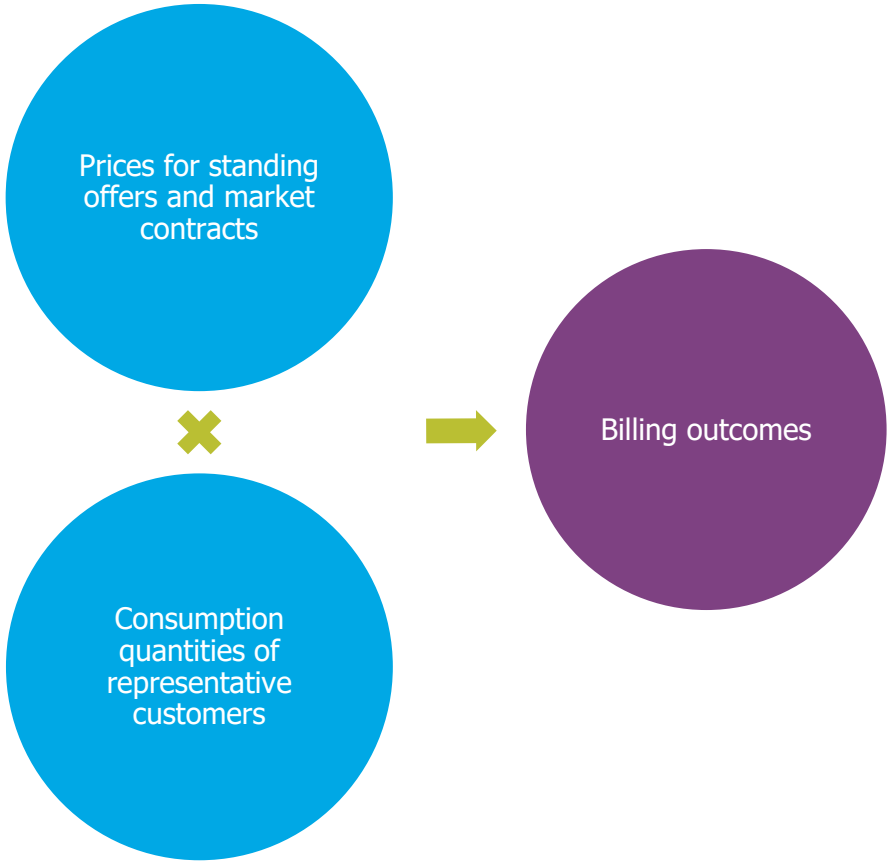
Source: South Australia Government

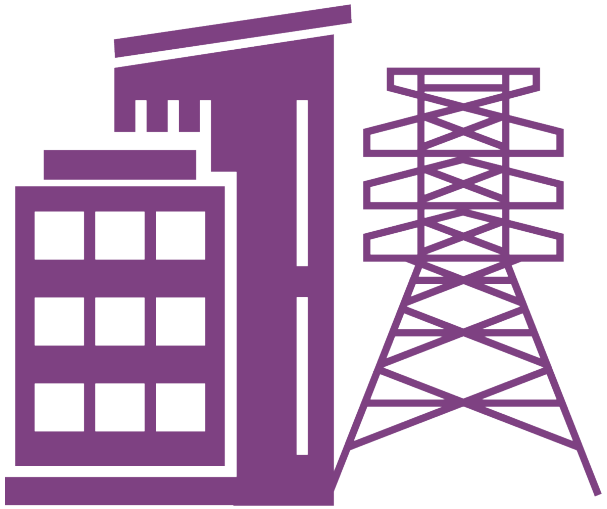
Table 3: Annual consumption of representative consumer – provided by Tasmanian Economic Regulator

JURISDICTION	MOST COMMON HOUSEHOLD TYPES	TOTAL ANNUAL CONSUMPTION (KWH) PT2020	TOTAL ANNUAL CONSUMPTION (KWH) PT 2021
Tasmania	2 person household, no mains gas, electric space, electric water heating and on the regulated standing offer	7,908	7,666

Source: Tasmanian Economic Regulator

Representative retail electricity prices





Our analysis has used the lowest offer for each retailer

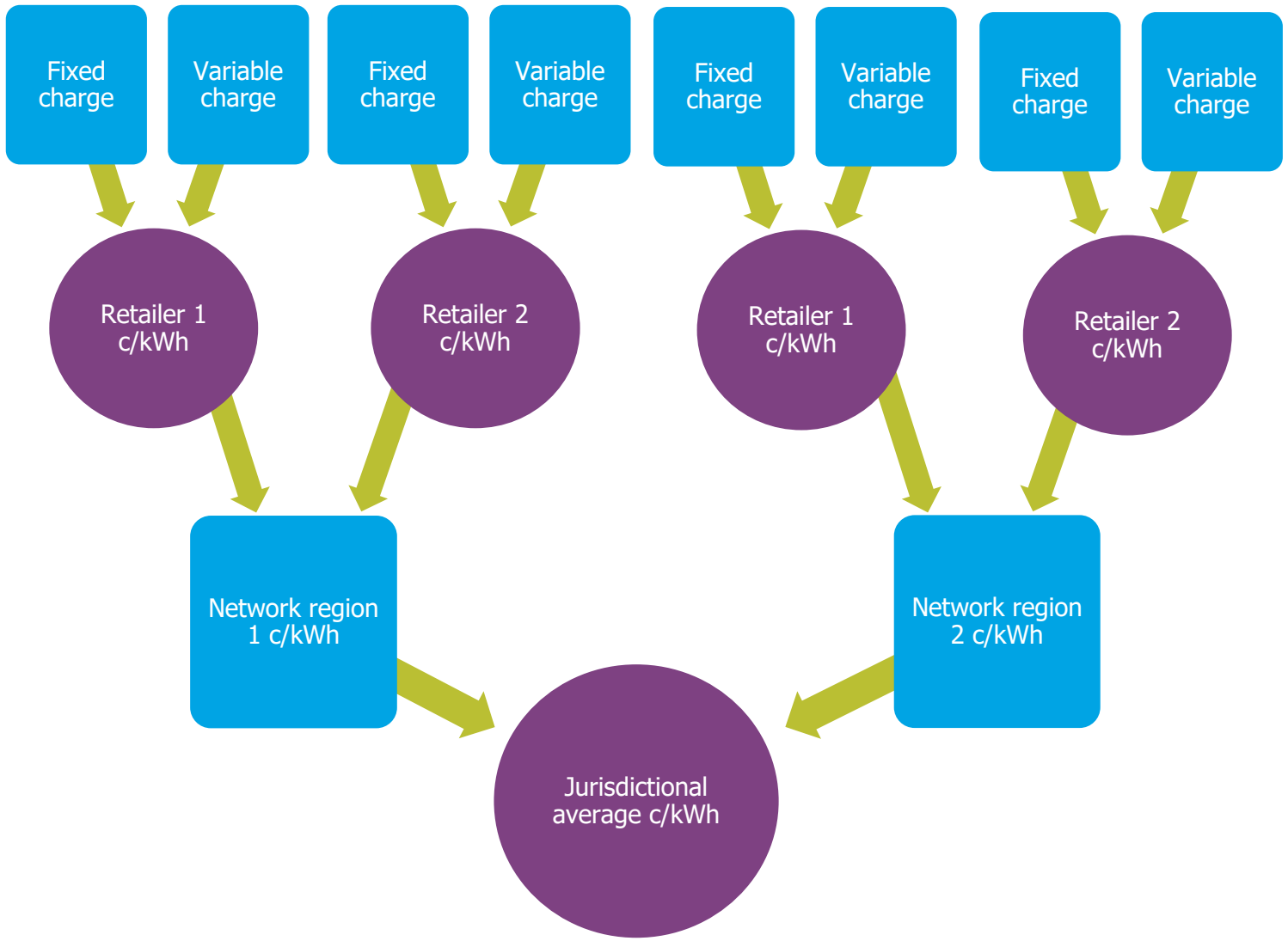
Actual retail offers for 2020-21 and 2021-22

Table 4: Sources of electricity pricing data

JURISDICTION	OFFER	2020-21	2021-22
NSW, ACT, SA	Standing	Retailer offers obtained from Energy Made Easy on 11 September 2020	Retailer offers obtained from Energy Made Easy on 17 September 2021
	Market		
South East Queensland	Standing	Retailer offers obtained from Energy Made Easy on 11 September 2020	Retailer offers obtained from Energy Made Easy on 17 September 2021
	Market		
Tasmania	Standing	Aurora Energy approved standing offers prices from 1 July 2020	Aurora Energy approved standing offers prices from 1 July 2021
	Market	None	None
Victoria	Standing	Retail offers obtained from Victorian Energy Compare on 15 October 2020	Retail offers obtained from Victorian Energy Compare on 17 September 2021
	Market		

Source: AEMC and cited sources
Note: These offer prices include both variable and fixed charges. In previous years, Victorian price changes occur on a calendar year basis, unlike all other jurisdictions where price changes occur on a financial year basis. From 30 June 2021 onwards, Victorian price changes occur on a financial year basis instead as approved by the Victorian government.

Process of calculating a jurisdictional average price



Step 1 Converting pricing into cents per kilowatt hour values

Step 2 Within a network distribution area, each retailer's pricing (in c/kW) is weighted by their market share to get an average price for the distribution area.

Step 3 The average retail pricing for each distribution network is weighted by the proportion of customers to get an average retail price per jurisdiction.

MAIN ASSUMPTIONS

ELECTRICITY SUPPLY CHAIN COST COMPONENTS

Regulated network costs

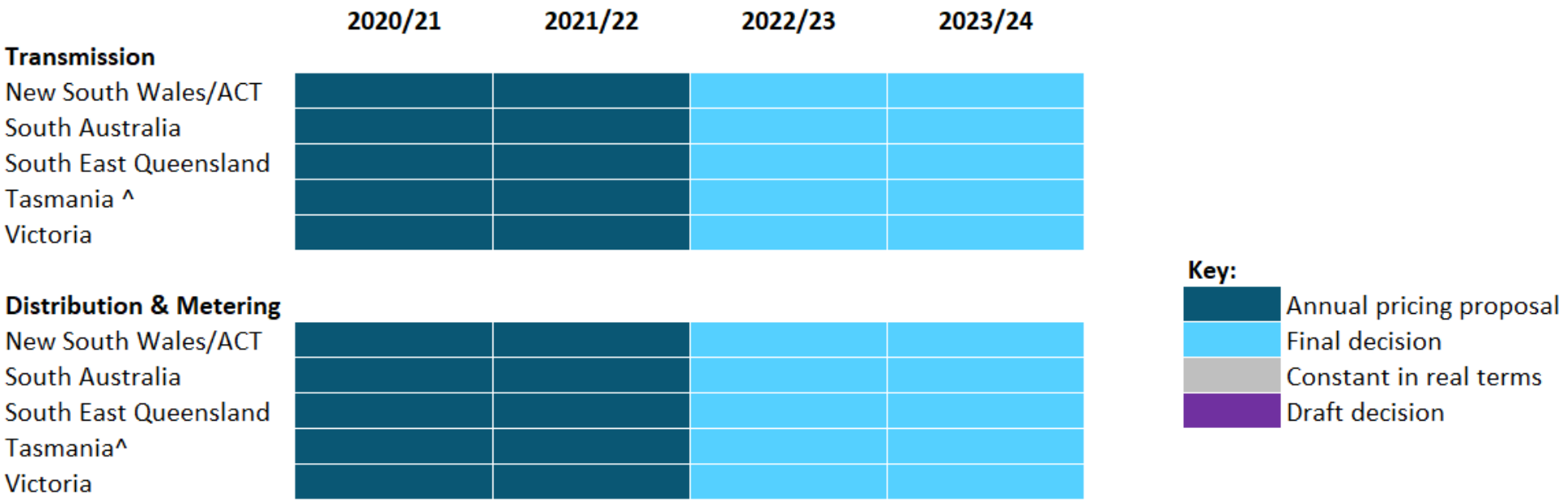
Regulated network costs are estimated using Annual Pricing Proposals produced by the distributed network service providers (DNSPs) before each new financial year (or calendar year for Victorian network businesses). These proposals are to be approved by the AER and set out the overall network use of service (NUOS) charge for each tariff class. This can be broken down into the:

- transmission use of service charge (TUOS)
- distribution use of service charge (DUOS)
- metering charges (capital and non-capital)
- jurisdictional scheme costs (if applicable).

We assume the representative consumer in each jurisdiction still has a Type 6 accumulation meter owned by a DNSP.

Regulated network costs – Network tariff sources and regulatory periods

Summary of approaches for estimating network costs



^These network service providers are both the tranmissions and distribution businesses.

Wholesale electricity costs in the NEM

Ancillary services are those services used by the market operator to manage key technical characteristics of the power system, such as frequency control. Based on AEMO's historical 2020/21 to 2021/22 ancillary service settlement data, we have used 3-year moving average to interpolate results in future years.

Estimated transmission and distribution loss factors were based on AEMO's 2020/21 and 2021/22 loss factor data, except for Tasmania where the factors were obtained from the Tasmania Energy Regulator's (TER) retail pricing determination.

There are many steps in the process of calculating wholesale electricity purchase costs. In subsequent slides we will examine these in details.

Market fees are charges to market participants to cover the operational expenditures of AEMO. AEMO's estimated market fees have been used for the reporting period. The actual NEM fees for 2020-21 and 2021-22 are $0.54/MWh and $0.59/MWh respectively. The fee is then estimated to increase to 9% each of the forward 3 years.

Wholesale electricity purchase costs – Main assumptions

1. Create price paths using market modelling

- Bids are updated based on fuel costs and ESOO 2021
- Historical bids calibrated to future prices
- Demand profile from ESOO*
- 10 random unit outages
- Load trace from 5 different reference years
- 50% and 10% POE** demand conditions

2. Calculate hedging portfolio

- Assume a risk-averse behaviour
- NSLP and MRIM are used to represent retailer's loads
- Contract prices are based on 24-month exponential book build
- Heuristic hedging profile determine contract volumes

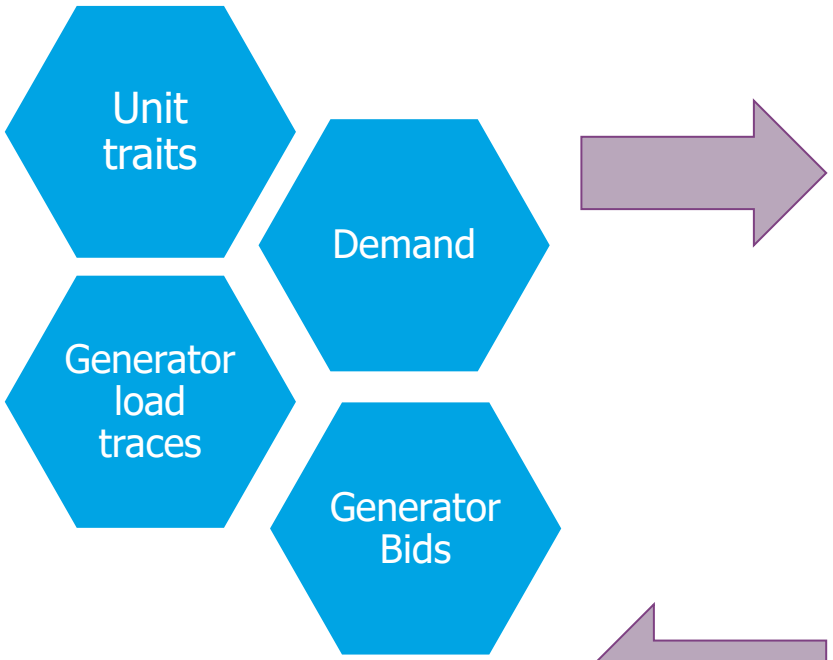
3. Calculate wholesale electricity purchase costs for each DNSP

- 2 price levels – POE10 and POE50
- Determine 95th percentile of WEPCs
- Determine cash flows for 500 price paths

*Electricity Statement of Opportunities
**Probability of Exceedance

1. Create price paths using market modelling

Initial inputs to market model



Results from market model are used to optimise and create the final price paths

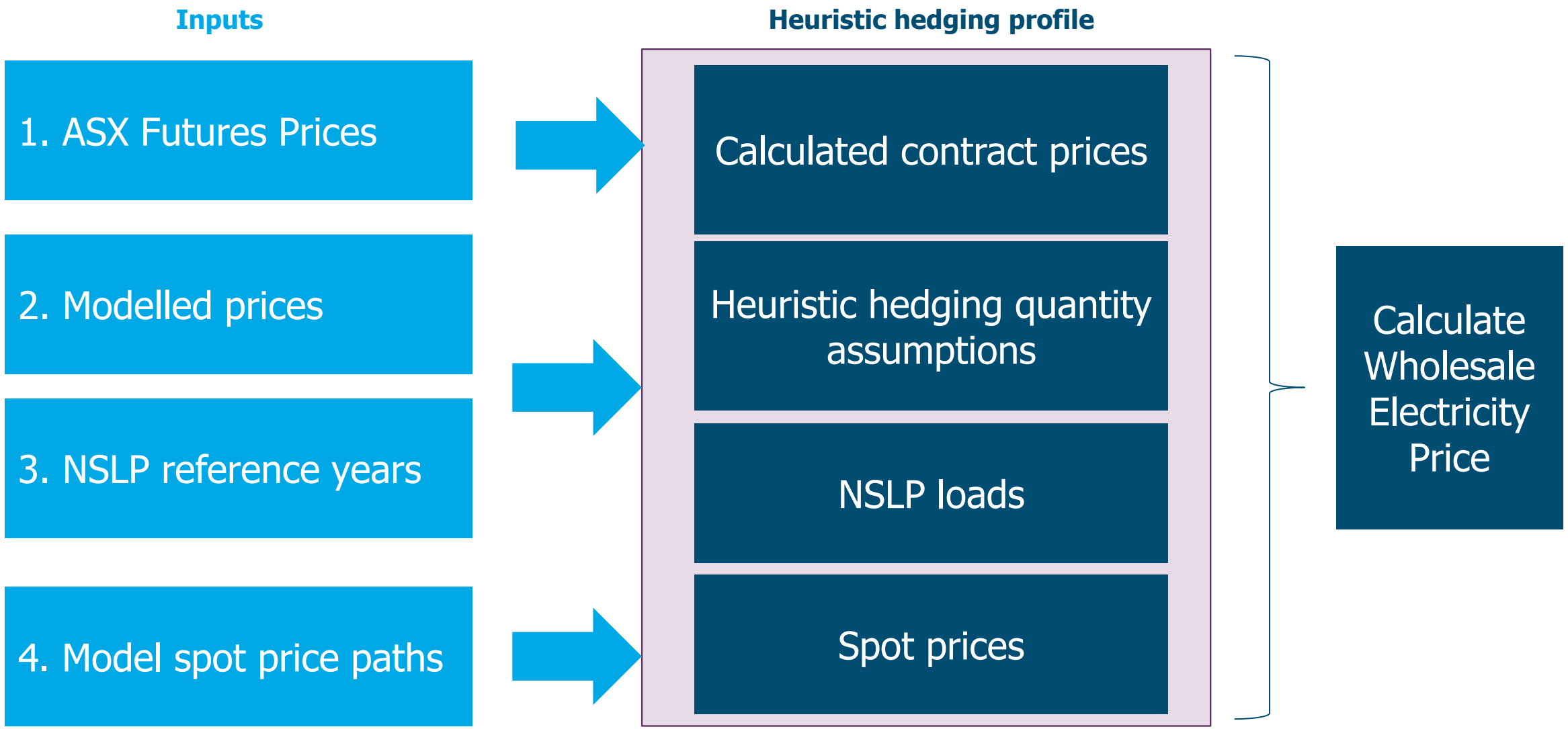
Medium-term run:
- Solve for marginal cost of water for hydro units
- Create random unit outages

Short-term run:
- 30 minute intervals
- Solve for optimal dispatch and resulting prices

- Prices
- Dispatch

Calibrate results to ASX forward curve

2. Calculate optimal hedging portfolio



3. Calculate wholesale electricity purchase costs for each DNSP

Step 1

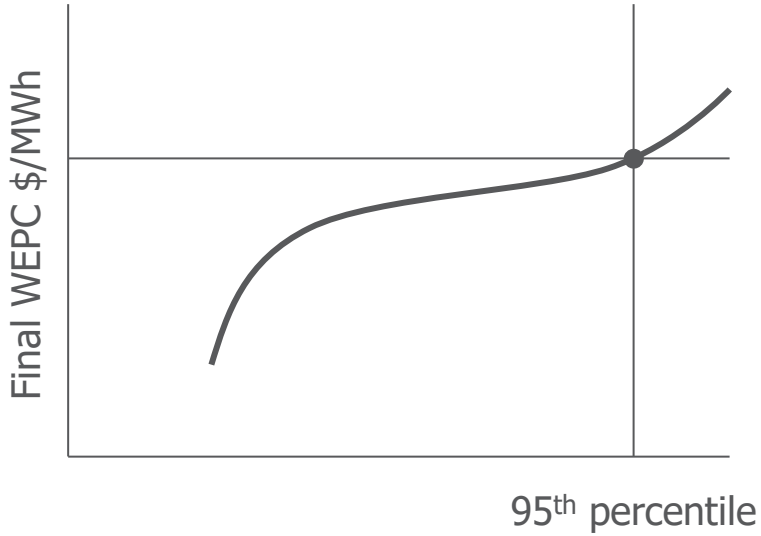
Calculate WEPCs for each DNSP and load type

- 2 price levels – POE10 and POE50
- 5 NSLP load traces
- 5 reference years
- 10 outages

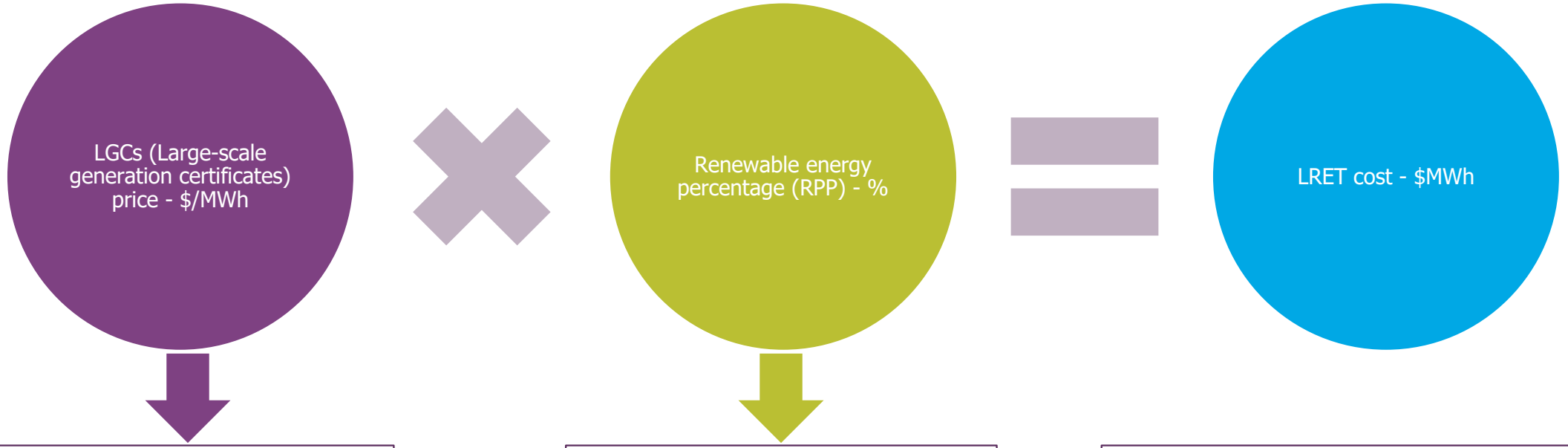
This results in 500 price paths

Step 2

Obtain the 95th percentile WEPCs



Environmental costs – Renewable energy target - LRET

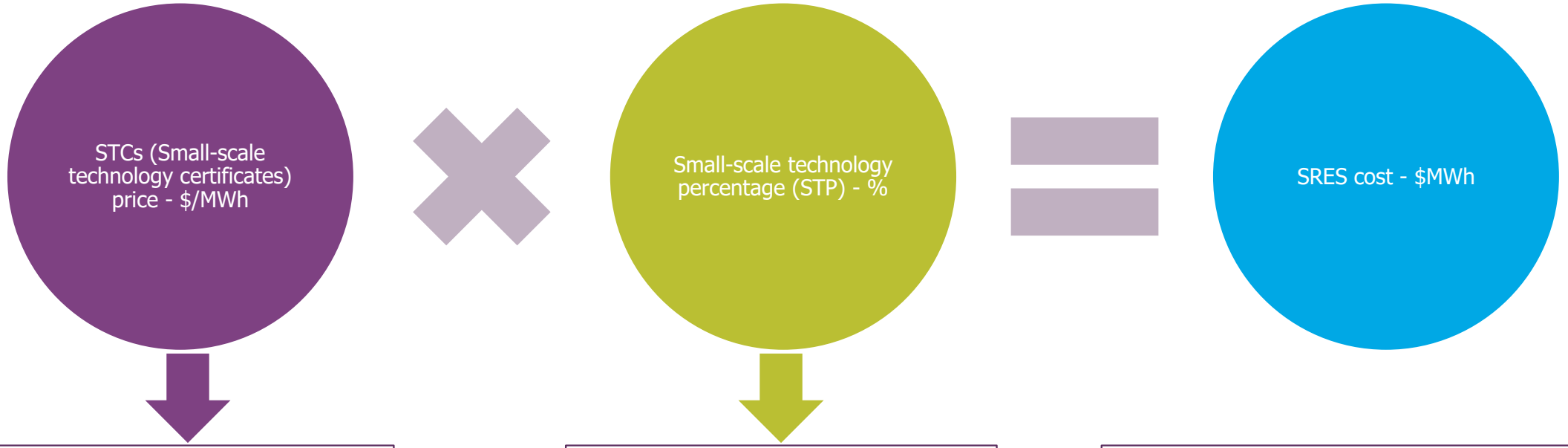


Fair value of the subsidy required for a new entrant renewable generator entering into a power purchase agreement (PPA) to recover its fixed and variable costs. This is based on the LGC closing rates from Mercari.

Minister for Energy set the RPP by the end of March each year, which is based on the legislated 33,000 GWh by 2020. Since the RPP is set on a calendar year basis, a 75/25 per cent split has been used to convert it to financial year basis due to the release date.

The calculation of RPP is the quantity of renewable electricity required to meet the annual target (accounting for any prior year carry-overs) divided by the total electricity acquisitions (equivalent to their total customer base's consumption level, less any exemptions, such as for emissions intensive trade exposed industries).

Environmental costs – Renewable energy target - SRES

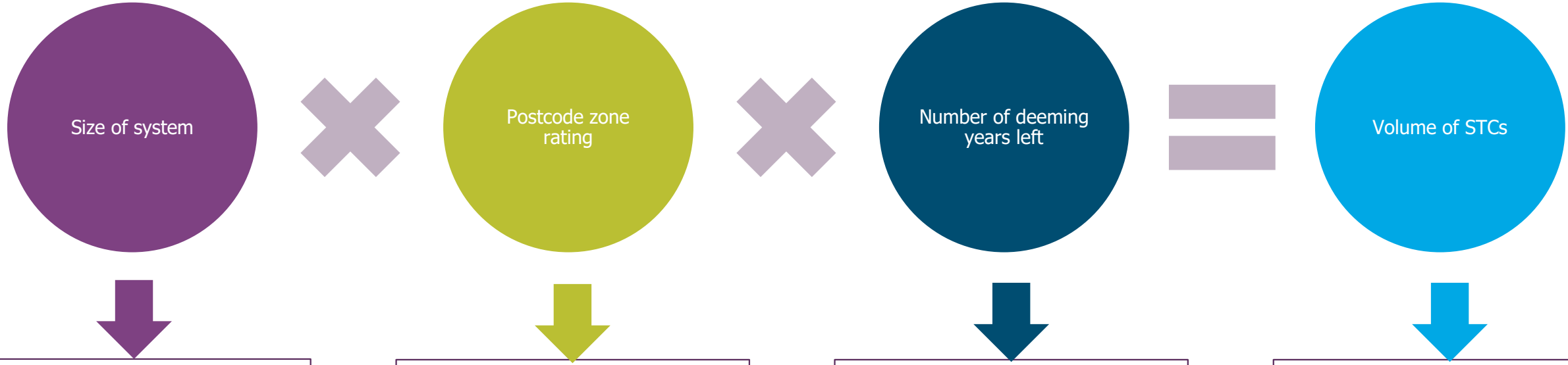


STCs are traded in the wholesale market, so the price depends on the supply and demand for certificates. Price is assumed to be at $35/MWh.

The small-scale technology percentage is set in the same way as the RPP but rather than adjusting it to meet a target like done in the LRET scheme, it is set to adjust demand for certificates to balance supply. STP also uses a 75/25 per cent split.

The calculation of STP is the estimated number of STCs to be created for the year (accounting for any prior year carry-overs) divided by the total electricity acquisitions (equivalent to their total customer base's consumption level, less any exemptions, such as for emissions intensive trade exposed industries).

Environmental costs – Renewable energy target – SRES - STCs



Assume around 3.1GW of capacity installed in 2021, 3.3GW in 2022, 3.5GW in 2023 and the same in 2024

Installations are in postcode zone 3 with postcode rating of 1.382. The other three postcode zones are zone 1 (1.622), zone 2 (1.536) and zone 4 (1.185) – postcode zone 3 is chosen because of the coverage around the installations.

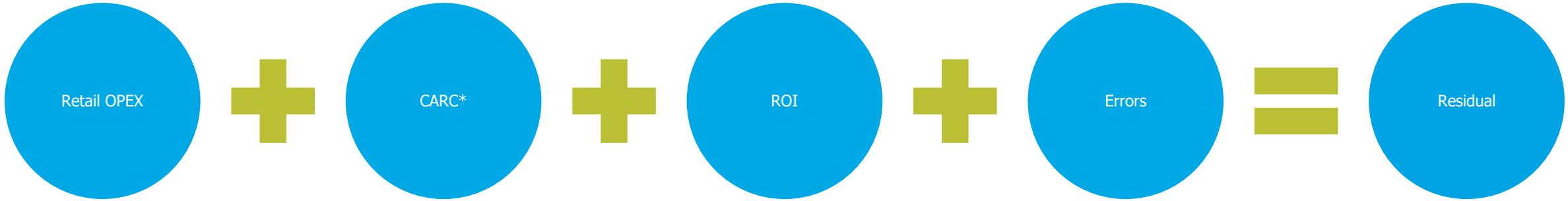
Use the deeming periods (10 years for 2021, 9 years for 2022 and so on)

Include static solar water heater STCs at around 2 million STCs

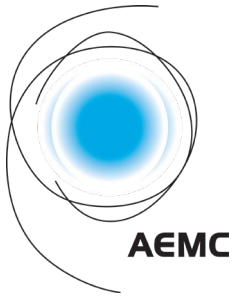
Residual component or retail cost

Method of deriving the residual component from the retail offer price

Representation of residual component



*CARC = Customer acquisition and retention cost



Office address
Level 15, 60 Castlereagh Street
Sydney NSW 2000

ABN: 49 236 270 144

Postal address
GPO Box 2603
Sydney NSW 2001

T (02) 8296 7800