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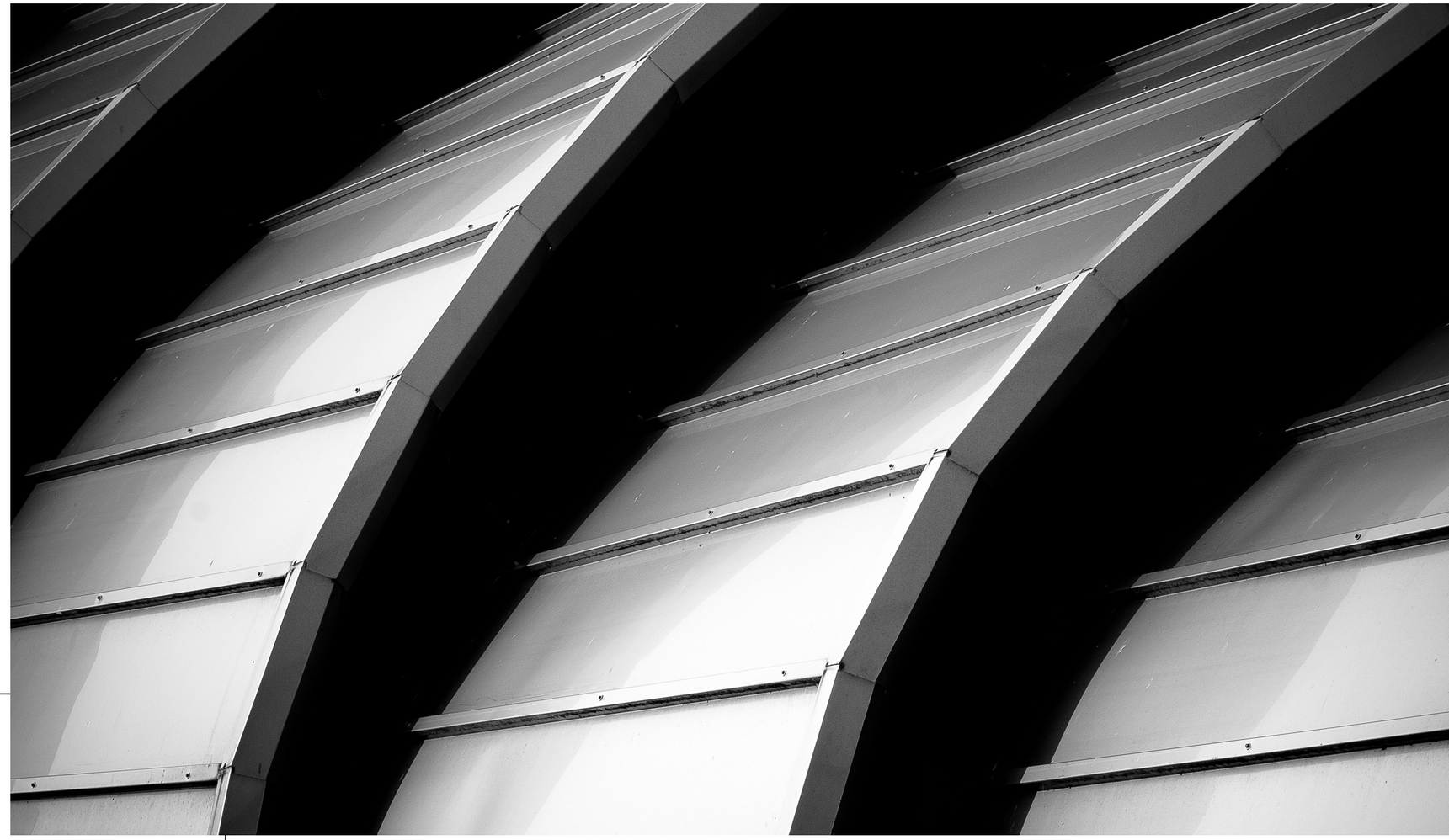

APPENDIX 1 GOVERNMENT ENERGY MARKET INTERVENTIONS

JURISDICTION	NAME	CAPACITY	DETAILS	ESTIMATED COST	ANNOUNCEMENT DATE	IMPLEMENTATION DATE	STATUS	
PUBLIC INVESTMENT IN GENERATION AND STORAGE								
Federal	Snowy Hydro 2.0	2000 MW/ 35 0000 MWh	Snowy Hydro 2.0 is a proposal to expand the existing Snowy Hydro dam system to allow for additional pumped hydro storage.	$3.8–4.5 b	March 2017	2024	Proposed	A feasibility study was released 20 December 2017 by Snowy Hydro. In July 2018 Snowy Hydro released a project update and said that it had begun geotechnical drilling and work on project design and approvals. A Final Investment Decision to proceed was made by Snowy Hydro's board of directors on 12 December 2018.
Queensland	CleanCo	1000 MW	CleanCo is a new generation company established by the Queensland Government with a commercial mandate to increase competition in the generation market. It will focus on low and no emissions technology. Initially, renewable and low emission generators will be transferred to CleanCo from other state-owned generators. Once established, CleanCo will invest in an additional 1000 MW of renewable capacity by 2025.	$250 m	June 2017	2019	Committed	CleanCo is expected to begin trading in the NEM by mid-2019 and has been allocated initial funding of $250 m from the Queensland Government.
Queensland	Swanbank E Recommissioning	385 MW	Swanbank E is a 385 MW combined cycle gas turbine. It was mothballed in 2014 and its gas entitlements sold off. The Queensland Government announced in June 2017 that the plant would return to service. The generator is part of the government-owned Stanwell Corporation.		June 2018	December 2017	Completed	The plant returned to service in December 2017.
Queensland	Burdekin Hydro	50 MW	The Queensland Government intends to reinvest $100 m in dividends from Stanwell Corporation to develop a 50 MW hydro-electric generator at the Burdekin Falls Dam, subject to the outcomes of a feasibility study.	$100 m	June 2017	2020	Proposed	In October 2017 Stanwell Corporation completed a pre-feasibility study. A detailed business case is being developed.
South Australia	South Australia Temporary Generation Initiative	276 MW	The South Australian Government leased nine transportable generator units to provide 'stabilisation services' and to prevent load-shedding in periods of scarcity. The units run on diesel, with the option to convert to gas.	$339 m	March 2017	November 2017	Completed	Generation units were connected 13 November 2017. The previous South Australian Government subsequently purchased the turbines outright, and announced plans to convert them from diesel to gas fuelled and relocate them at a single site to provide permanent government-owned gas peaking capacity. The current South Australian Government is running a tender process for a private company to operate the generation units for 25 years.
South Australia	Hornsdale Power Reserve	100 MW/ 129 MWh	The Hornsdale Power Reserve or 'Tesla Big Battery' comprises 129 MWh of lithium-ion batteries located at the 315 MW Hornsdale wind farm in South Australia. The battery is contracted by the South Australian Government to provide 70 MW for up to 10 minutes (11.7 MWh) of grid services and to prevent load shedding under a $50 m contract. The remaining 90 MWh of storage capacity (30 MW for up three hours) is used by Neoen for load management.	$80 m ($US50 m)	July 2017	December 2017	Completed	Hornsdale Power Reserve was connected on 1 December 2017. Estimates suggest that it reduced Frequency Control Ancillary Service (FCAS) costs by around 90 per cent and achieved a 55 per cent share of the South Australian FCAS market.
Tasmania	Battery of the Nation	2500 MW	Proposal to construct 2500 MW of pumped hydro storage through additions to existing Tasmanian hydroelectric infrastructure.	$7.4 b for all 4800 MW	April 2017	2023–24	Proposed	A concept study conducted by Hydro Tasmania, in partnership with ARENA, identified 14 suitable sites with a total potential capacity of 4800 MW. Hydro Tasmania is conducting pre-feasibility studies to narrow down sites to around 2500 MW of capacity, due to be complete in 2019.
NON-PRICE REGULATION								
Federal	National Energy Guarantee (NEG)		The NEG aims to integrate reliability and emissions reduction objectives into a single national electricity policy. Large users purchasing on the wholesale market would be required to ensure that the average emissions intensity of their load was below a specified target. Where a reliability gap is identified by AEMO, large electricity users and retailers would be required to contract for the purchase of a minimum quantity of electricity from 'reliable' dispatchable generators to cover the shortfall.		October 2017	July 2019	Announced	The Australian Government in October 2017 announced it would implement the NEG with an emissions reduction target of 26–28 per cent by 2030. In August 2018, it abandoned the emissions component. The Government retained only the reliability requirement as part of a new energy policy. The Federal opposition announced it would adopt a version of the NEG if elected, with an emissions reduction target of 45 per cent by 2030.

JURISDICTION	NAME	CAPACITY	DETAILS	ESTIMATED COST	ANNOUNCEMENT DATE	IMPLEMENTATION DATE	STATUS	
Federal	Divestiture and directions powers		In late 2018 the Australian Government drafted legislation to insert a power into the *Competition and Consumer Act 2010* enabling the Courts, on the advice of the Treasurer and ACCC, to order divestiture of an asset by energy companies, or order electricity companies to enter into contracts to supply at specified prices and for specified volumes. The draft legislation listed grounds to force asset divestment, including a retailer's failure to pass on lower wholesale prices to energy customers, or attempts by energy companies to manipulate spot or contract markets		October 2018		Announced	The government aims to introduce the legislation to the Australian Parliament in 2019.
Queensland	Stanwell Direction		On 6 June 2017 the Queensland Government directed state owned generator Stanwell to alter its bidding behaviour in the NEM during peak periods to put downward pressure on prices.		June 2017		Implemented	Stanwell Corporation stated that it adjusted its bidding behaviour in line with the Direction. Queensland prices in 2017–18 were the lowest for any NEM region. Prices were 27 per cent lower than a year earlier, the largest reduction for any region. Generators shifted capacity previously bid at over $5000 per MWh to lower prices, typically below $300 per MWh.
FINANCIAL INCENTIVES FOR PRIVATE INVESTMENT								
Federal	Clean Energy Finance Corporation	2400 MW (large scale only, this number includes projects financed under other programs)	The Clean Energy Finance Corporation was established in 2012 as a government-owned green bank. The fund provides debt and equity financing on terms designed to deliver on public policy objectives. Its governance framework requires it to deliver a positive return to taxpayers and evaluate investments in a commercial way. The CEFC has access to $10 b of funding, allocated in $2 b tranches each year from 2013 to 2017.	$10 b	July 2011		Implemented	At 30 June 2018, CEFC investments since inception totalled $6.6 b and it held a portfolio valued at $5.3 b. The total value of projects in which it has invested since inception is around $19 b. These investments include 5500 small scale clean energy projects, 20 large scale solar projects, and 10 wind farms. In 2017–18 the CEFC committed $2.3 b to 39 projects.
Federal	Emissions Reduction Fund		The Emissions Reduction Fund was established by the Australian Government in 2014 to help Australia achieve emissions reductions on 2005 levels of 5 per cent by 2020 and 26–28 per cent by 2030. $2.55 billion has been budgeted to fund projects that would reduce carbon emissions, which is allocated through reverse auctions. The fund is coupled with the ERF Safeguard Mechanism, which caps emissions for facilities with annual direct emission of more than 100 000 tonnes of CO_2 equivalent/year (about 50 per cent of Australia's emissions).	$2.55 b	April 2014	2030	Implemented	By the sixth auction in 2018, 12 projects had received funding under the ERF that involved new electricity production or upgrades to existing plant. Total abatement committed under contract for these projects is 3.56 million tonnes CO_2-e. Most of the projects capture and combust waste methane gas from coalmines or landfill for use in electricity generation. Electricity projects represented less than 2 per cent of carbon abatements funded under the scheme.
Federal	Australian Renewable Energy Agency	263 MW (many of these projects are small-scale or demonstration only and overlap with other programs)	The Australian Renewable Energy Agency was established in 2012 as an independent statutory agency charged with funding research, development and commercialisation of clean energy technologies. Much of its funding is provided in the form of grants and its mandate is not to generate a profit but to advance clean energy technology. It has a total allocation of $3.2 b between 2013 and 2022.	$2 b	July 2011	2012	Implemented	At 30 June 2018, ARENA had allocated $1 b in grant funding to 320 projects, totalling 263 MW of capacity. This includes 12 large-scale solar plants, many with CEFC involvement. It has $2.5 b worth of projects in development.
Federal	Underwriting Investment		The Australian Government proposes to underwrite new investment in dispatchable generation capacity. This may take the form of a floor price, contracts for difference, collar contracts, government loans, or some alternative mechanism. The program would be open to new applicants for four years and provide support between years six and 15 of plant operation.		October 2018		Announced	The Federal Department of Environment and Energy released a consultation paper on underwriting new generation investments in October 2018. Expressions of interest are expected to open in December 2018 or January 2019 and proposals will be due by March 2019. Financial support is expected to commence from 1 July 2019.
Queensland	Renewables 400	400 MW	The Queensland Government is conducting a reverse auction, using contracts for difference, for 400 MW of renewable capacity (including a 100 MW storage component) to be delivered before 2020.	$1.16 b (total Powering Queensland Plan cost)	August 2017	2018	Implemented	Expressions of interest for the reverse auction process closed 25 September 2017 with 115 proposals totalling 15 000 MW. Binding bids were due in early 2018 but results had not been announced by December 2018.

JURISDICTION	NAME	CAPACITY	DETAILS	ESTIMATED COST	ANNOUNCEMENT DATE	IMPLEMENTATION DATE	STATUS	
Queensland	Solar 150	300 MW	The Queensland Government intendeds to support 150 MW of large-scale solar projects, successful through the ARENA large-scale solar PV - competitive round in Queensland using contracts for difference.	$1.16 b (Total Qld Power Plan cost)	July-15	2018	Completed	The program closed to new applicants on 15 June 2016. There were six successful projects in Queensland with a total capacity of 300 MW. Construction began in 2017 and all projects are due for completion by the end of 2018.
Queensland	Solar Rebate Queensland		The Queensland Government allocated $23 m to provide no interest loans and rebates for the installation of residential PV and battery storage. Loans are worth up to $4500, repayable over seven years and are available until 30 June 2019 or until funding is exhausted. 500 $3000 grants and $6000 loans repayable over 10 years are available for battery storage. 100 $3000 grants and $10 000 loans will be available for combined solar and battery systems.	$21 m	May 2018	June 2018	Committed	Loan applications for solar PV systems opened 1 June 2018. Applications related to battery and combined solar/battery systems opened 19 November 2018. On 30 November the government announced a further 1000 solar and battery packages. The government estimated funding would be exhausted by 15 December 2018.
NSW	Emerging Energy Program		The program aims to support large scale projects using emerging and renewable technologies that can provide dispatchable or on-demand energy to boost energy security. Projects must have the ability to manipulate output in response to wholesale energy or ancillary service price signals. The program will provide funding to commercialise projects, as well as support pre-investment studies.	$55 m	October 2018	2019	Committed	Expression of interest will open in the first quarter of 2019.
Victoria	Victorian Renewable Energy Auction Scheme	650 MW/ 928 MW	The scheme offers long term contracts for difference designed to support investment in renewable energy generation. It was initially to deliver 650 MW of capacity, including 100 MW of large scale solar. The government will make a determination on the need for further auctions to meet the VRET as required.	$1.16 b (total project capital investment, with further $711 m in operating expenditure over 15 years, government spend unclear)	June 2016	September 2018	Completed	In September 2018 the Victorian Government announced support for six projects with a total capacity of 928 MW, including 673 MW of wind and 254 MW of solar. The projects were backed with 15 year contracts for difference that include price floors and annual caps on payments.
Victoria	Solar Homes Package	2600 MW generation (based on 650 000 homes with 4 kW systems) and 110 MWh storage (based on 10 000 1 kWh systems)	The scheme covers upfront costs of up to $4450 for the installation of new solar PV systems (50 per cent of the cost, up to $2225 as a grant and a further $2225 as a four year interest free loan). The government estimates the policy will support installation of 650 000 systems. The scheme will also provide a 50 per cent rebate on battery installations (capped at $4838 in the first year and tapering to $3714 by 2026) to around 10 000 homeowners with existing solar panel installations, and up to $1000 towards the installation of a solar hot water system for 60 000 homes that are not suitable for solar panels. The program is restricted to households with an income less than $180 000 and homes valued at less than $3 m.	$1.28 b	August 2018	August 2018	Implemented	The rebates for solar panels and hot water systems are available for systems installed from 19 August 2018 to 30 June 2019. The batteries component of the scheme will run over 10 years or until funding is exhausted.
Victoria	Renewable Certificate Purchasing Initiative	280 MW	The Victorian Government committed to purchase 280 MW of renewable energy certificates directly from new Victorian projects.	$48.1 m	January 2017	August 2017	Implemented	In July 2016 the Victorian Government contracted with the 31 MW Kiata windfarm and the 132 MW Mt Gellibrand windfarm. In August 2017 it contracted with the 110 MW Bannerton Solar Park (which also received $98 m in CEFC financing) and the 38 MW Numurkah Solar Farm. No further tenders have been issued.

JURISDICTION	NAME	CAPACITY	DETAILS	ESTIMATED COST	ANNOUNCEMENT DATE	IMPLEMENTATION DATE	STATUS	
Victoria	Grid Scale Battery Project	55 MW/ 80 MWh	The Victorian Government committed $25 m in funding for grid scale battery storage projects. The projects are designed to ease constraints on transmission lines in Western Victoria.	$25 m	March 2017	March 2018	Committed	In March 2018 the Victorian Government announced $25 m in grant funding matched by $25 m from ARENA for two projects to be built by private consortia. A 25 MW/50 MWh battery connected to the Gannawarra Solar Farm commenced operation 16 October 2018. A 30 MW/30 MWh battery connected to the Ballarat Area Terminal Substation was completed 23 October 2018. Both plant will be privately owned and will be operated by Energy Australia. Both projects will be fully commissioned finish by summer 2018–19.
South Australia	South Australia Virtual Power Plant	250 MW/ 650 MWh	The South Australian Government proposed to install 50 000 home energy systems, each comprising a 5 kW solar photovoltaic system, a 5 kW/13.5 kWh battery and a smart meter. The systems will be rolled out over 4.5 years. The systems will be privately owned and operated by a 3rd party provider, with electricity provided to the consumer metered and billed to the household by a program retailer.	$800 m	February 2018	2022	Trial phase	In 2018–19, 1100 systems will be rolled out across South Australian Housing Trust properties, with a $2 m grant and $30 m loaned from the Renewable Technology Fund. Subject to the success of the trial phase a further 24 000 systems will be rolled out to public housing properties and 25 000 to private properties from 2019. Financing for the remainder of the program is yet to be determined but is expected to be raised from private investors.
South Australia	Aurora Solar Energy Project	150 MW/ 110 MWh	The South Australian Government contracted to source 100 per cent of the government's electricity requirements from the Aurora solar project, a 150 MW solar thermal plant at Port Augusta, due for completion in 2020. The project includes 1100 MWh storage (equivalent to around eight hours of supply) and would meet 100 per cent of the government's power needs for 20 years.	$650 m	August 2017	2020	Proposed	The South Australian Government signed a contract for the project in August 2017. At May 2018 the project was yet to complete financing. Construction was scheduled to commence in 2018.
South Australia	Home Battery Scheme	333–400 MWh +	The South Australian Government's Home Battery Scheme will provide 40 000 South Australian households with access to around $100 m in grants over four years and $100 m in loans from the Clean Energy Finance Corporation to help pay for the installation of home battery systems. The subsidy will be $500 per kWh ($600 per kWh for concession customers), capped at $6000. Battery systems installed under the scheme must be capable of being remotely controlled as part of a coordinated fleet of storage systems.	$200 m	September 2018	October 2018	Committed	Grants will be available from October 2018. $12.5 m in funding has been allocated for around 5000 households in the first year of the scheme.
South Australia	SA Renewable Technology Fund		The fund has $150 m to allocate, including $75 m in grants and $75 m in loans.	$150 m	March 2017	July 2017	Committed	The Hornsdale Power Reserve was the first project to receive money from the Fund in July 2017. In August 2017, second round proposals were called for resulting in 80 submissions. On 16 March 2018, the Fund announced a $10 m loan to SIMEC Zen Energy for a 120 MW/120 MWh battery to be built in Port Augusta On 15 August 2018 the Fund announced a $5 m investment, along with $5 m from ARENA in a $38 m, 25 MW/52 MWh battery project adjacent to the Lake Bonney Wind Farm.
South Australia	Grid Scale Storage Fund		The South Australian government established the fund to support development of new energy storage projects. It will target distributed storage (behind-the-meter projects in commercial and industrial facilities or in the distribution network), which will be operational within two years, and centralised storage (projects located upstream in the electricity network) that will be operational within four years. It intends to coordinate with ARENA on project assessment and funding.	$50 m	November 2018	November 2018	Implemented	Applications for funding close 7 February 2019, with successful applications to be announced by mid-2019. The government states that it prefers projects that will reach financial close by the end of 2019.
ACT	NextGen Renewable Storage Scheme	36 MW	The project follows on from a pilot scheme begun in 2016. The ACT government will provide grants for 5000 home battery systems be installed by 2020, with 400 by the end of 2018.	$25 m	December 2015	2020	Implemented	Round 1 (pilot) and 2 of the program awarded $2.2 m for the installation of 800 systems. Round 3 closed in January 2018 with an allocation of $3 m.

JURISDICTION	NAME	CAPACITY	DETAILS	ESTIMATED COST	ANNOUNCEMENT DATE	IMPLEMENTATION DATE	STATUS	
RENEWABLE ENERGY TARGETS								
Federal	Renewable Energy Target (RET)	33 000 GWh	The current large scale target of 33 000 GWh of renewable electricity generation per year (expected to be equivalent to around 23.5 per cent of Australia's generation) by 2020 was introduced in 2015. Certificates under the scheme are created based on the output of accredited generators. A small scale scheme sits in addition to the target, with certificates created through the installation of approved systems by households or businesses. Retailers and large commercial users must surrender a specified number of certificates to the Clean Energy Regulator each year, based on their total electricity purchases in the NEM.		November 1997	2020		The scheme was first introduced in 2001 with a target of 9500 GWh per year by 2010. The target and elements of the scheme were revised in 2009, 2011 and 2015. The target increases each year to 2020, and then remains stable until the scheme ends in 2030. The Federal opposition Labor party has suggested it will lift the 2030 target to 50 per cent if elected.
Queensland	Queensland Renewable Energy Target		The Queensland Renewable Energy Target of 50 per cent renewable generation by 2030 is not a legislated. It is supported through government programs to encourage private investment, and through the state owned CleanCo (see above).	$1.16 b (Total Qld Power Plan cost)	2015	2030	Implemented	See details on specific programs above. The Queensland Government forecasts that by mid 2019 21 per cent of Queensland's electricity will be produced from renewable resources.
Victoria	Victorian Renewable Energy Target	5400 MW (2016 estimate of 2025 capacity)	The Victorian Government announced a renewable energy target of 25 per cent by 2020 and 40 per cent by 2025. These targets were legislated in the Renewable Energy (Jobs and Investment) Bill 2017 (Vic). The legislation requires the minister to make a minimum capacity determination to meet the 2020 target by 31 December 2017 and the 2025 target by 31 December 2019. The minister is required to report to parliament annually on progress.	$2.5 b (estimated total investment)	June 2016	2025	Implemented	On 28 December 2017, the Minister gazetted the capacity requirement, determining a total of 6341 MW of renewable energy would be required to meet the 25 per cent target in 2020. In November 2018, the government announced that, if relected it would raise the target to 50 per cent by 2030.
ACT	ACT Renewable Energy Target/ Large Scale Feed in Tariff	650 MW	The ACT target is for 100 per cent of Canberra's electricity needs to be met by renewable generation by 2020. The Electricity Feed-in (Large-scale Renewable Energy Generation) Act 2011 provides that the ACT Government may award Feed in Tariff entitlements to up to 650 MW of renewable energy generation. The projects may be constructed anywhere in the NEM. Contracts for difference for 20 year terms are awarded through reverse auctions. Generators must have LGCs for all eligible generation and surrender them to receive payment.	$14.6 m (for 240 MW in 2016–17)	September 2011	2020	Completed	In August 2016, the ACT government granted its last entitlements under the scheme. A total of 640 MW have now been awarded and the ACT government states that this will be sufficient to achieve the Territory's 100 per cent target by 2020.
PUBLIC INVETSMENT IN TRANSMISSION								
Queensland	North and North-West Queensland Strategic Transmission Infrastructure Investment		The Queensland Government intends to reinvest $150 m in dividends from transmission network operator Powerlink into transmission infrastructure linking the North Queensland Clean Energy Hub to the NEM. The government has indicated that the infrastructure would run from Townsville to Cairns via Hughenden and Kidston in North Queensland.	$150 m	June 2017		Proposed	Powerlink was due to provide a feasibility study of the North Queensland Clean Energy Hub to the Queensland government in December 2017.
NSW	NSW Transmission Infrastructure Strategy	1610 MW	The NSW Government intends to provide financial guarantees to the NSW transmission grid operator TransGrid to conduct early-stage planning and feasibility work on upgrades to the VIC-NSW Interconnector (170 MW), Qld-NSW Interconnector (190 MW), the SA-NSW Interconnector (750 MW), and new transmission from Snowy Hydro (500 MW). The plan includes an additional 2100 MW of transmission upgrades contingent on Snowy Hydro 2.0 being completed. The plan will also explore ways to improve interconnection to three Renewable Energy Zones in NSW and to streamline the Regulatory Investment Test for Transmission.	$2.6 b (total capital cost, government funding unknown)	November 2018	2024	Proposed	The plan aims to accelerate the development of transmission network upgrades by 6–9 months. In line with AEMO's Integrated System Plan, the first two projects are due to be completed by 2022 and the other two by 2023 and 2024 respectively.

JURISDICTION	NAME	CAPACITY	DETAILS	ESTIMATED COST	ANNOUNCEMENT DATE	IMPLEMENTATION DATE	STATUS	
South Australia	SA-NSW Interconnector Duplication	800 MW	Proposal to construct a new 800 MW interconnector between SA and NSW. The South Australian Government provided $0.5 m to ElectraNet, the operators of the South Australian transmission network, to run a feasibility study into the project. The government has since committed $14 m towards early works and has suggested it would contribute a further $200 m towards construction costs. The remainder of the costs would be financed by ElectraNet.	$214 m (total project costs estimated at $1.5 b)	June 2016	2021–2022	Proposed	In June 2018, Electranet released a Project Assessment Draft report, typically the 2nd step in a 3-stage RIT-T assessment. It assessed an option for a 920 km 330 kV connection between mid-north SA and Wagga Wagga in NSW, via Buronga would deliver the greatest net benefit to the NEM. This option would have a notional capacity of 800 MW and cost $1.5 b.
Tasmania	Marinus Link	600 MW/ 1200 MW	Proposal to duplicate the existing BassLink Interconnector between Victoria and Tasmania. Options exist for a 600 MW connection, which would rely on existing onshore transmission infrastructure, or a 1200 MW link that would require additional onshore investment. Modelling for the 600 MW link suggests a cost up to $1.1 b with a 2026 completion date.	$1.1 b	April 2016	2026–2033	Proposed	TasNetworks, in partnership with ARENA, is currently undertaking an initial feasibility report for the Tasmanian Government and ARENA. TasNetworks has also released a Project Specification Consultation Report, the first stage in the RIT-T process.