ACT GOVERNMENT

The Australian Capital Territory's reverse auctions and its 100%-by-2020 renewable electricity target

Clean Energy Solutions Centre webinar

9 October 2018

Greg Buckman
Senior Policy Officer
Energy Markets and Renewables Branch
Environment, Planning and Sustainable Development Directorate

ACT Government

Summary

- Policy overview
- Auction rules and legislation
- Auction evaluation
- ACT Auction outcomes
- Leveraging for innovation

ACT Government

Policy overview

ACT Climate Change Targets

2020

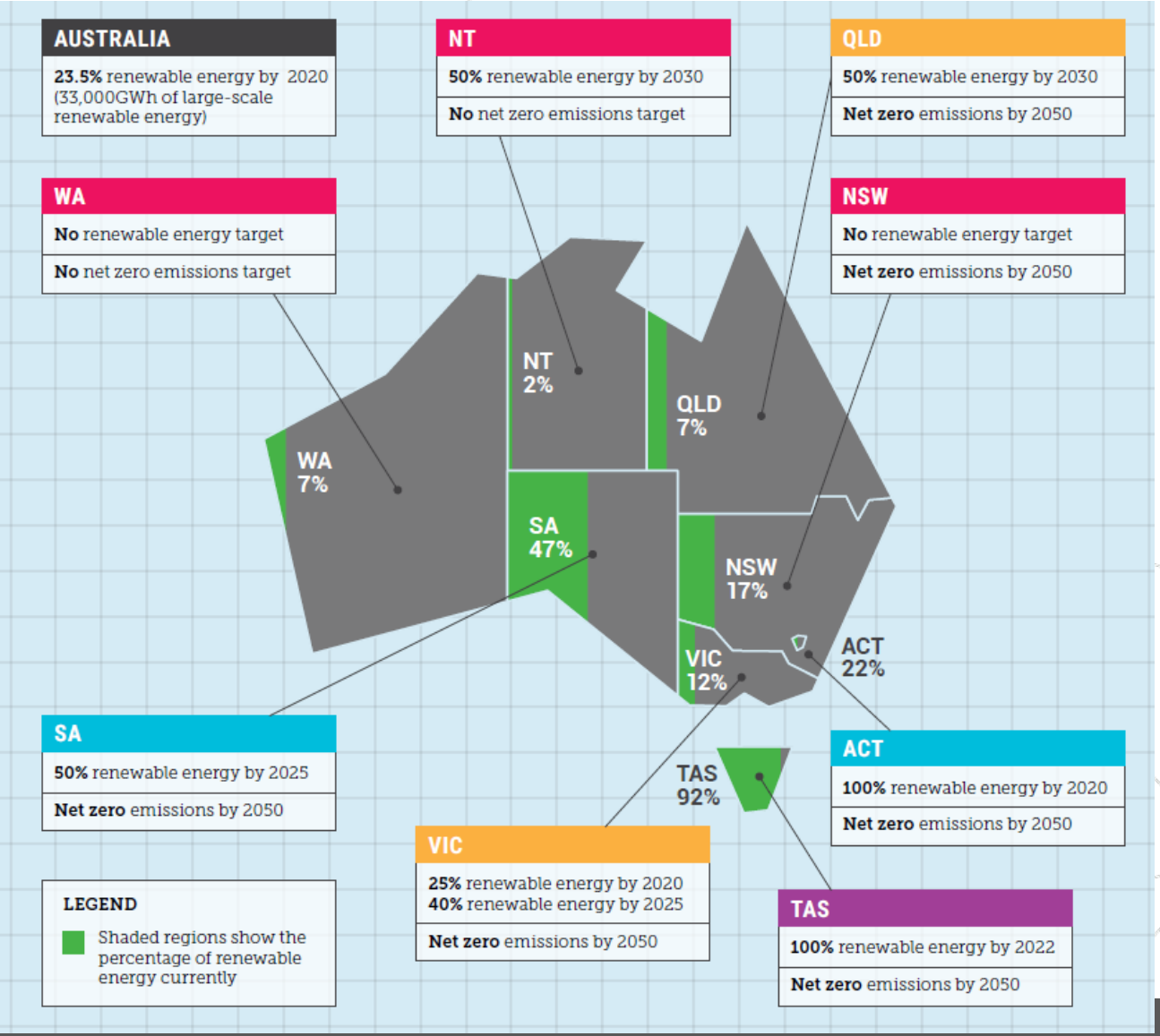
40% reduction in greenhouse gas emissions on 1990 levels

100% Renewable Electricity

2045

Zero net emissions

ACT renewable electricity target most ambitious in Australia



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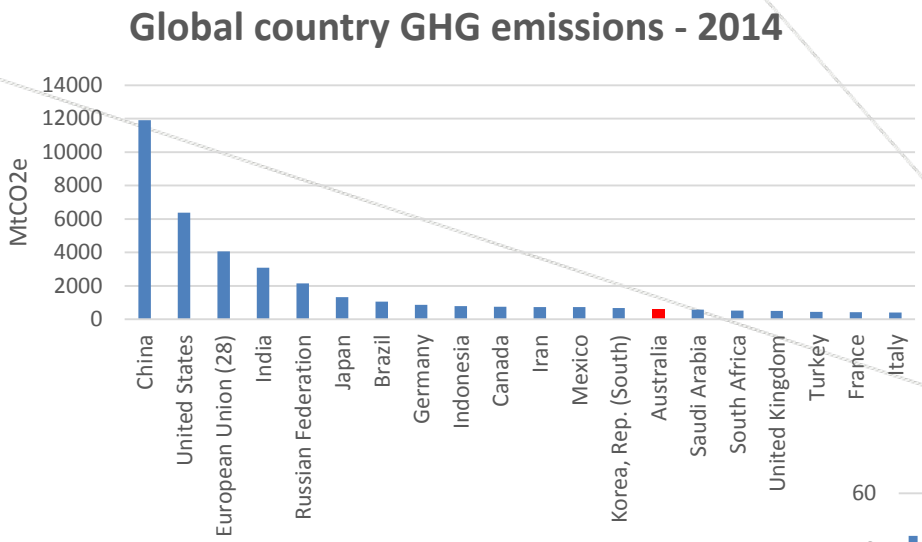
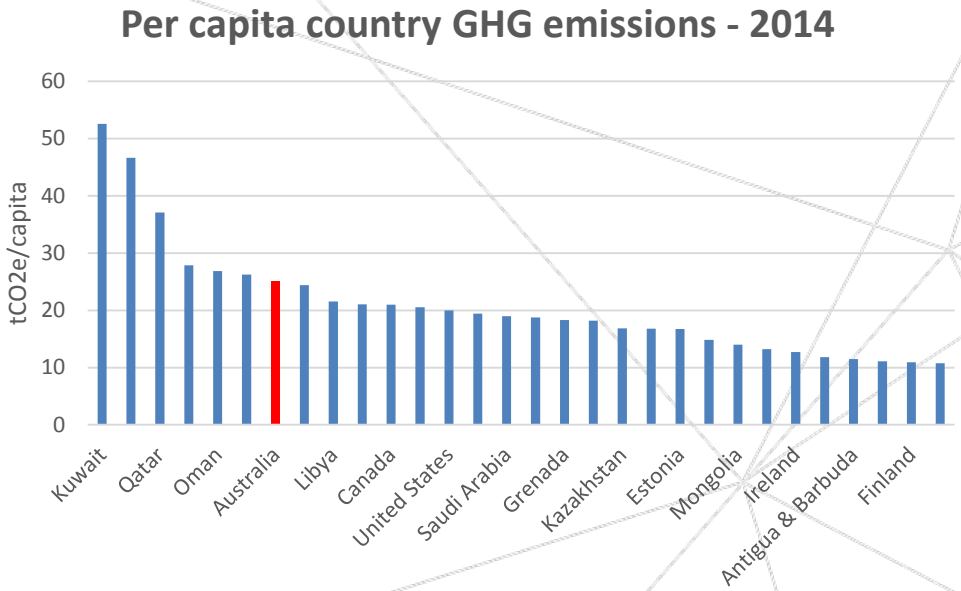
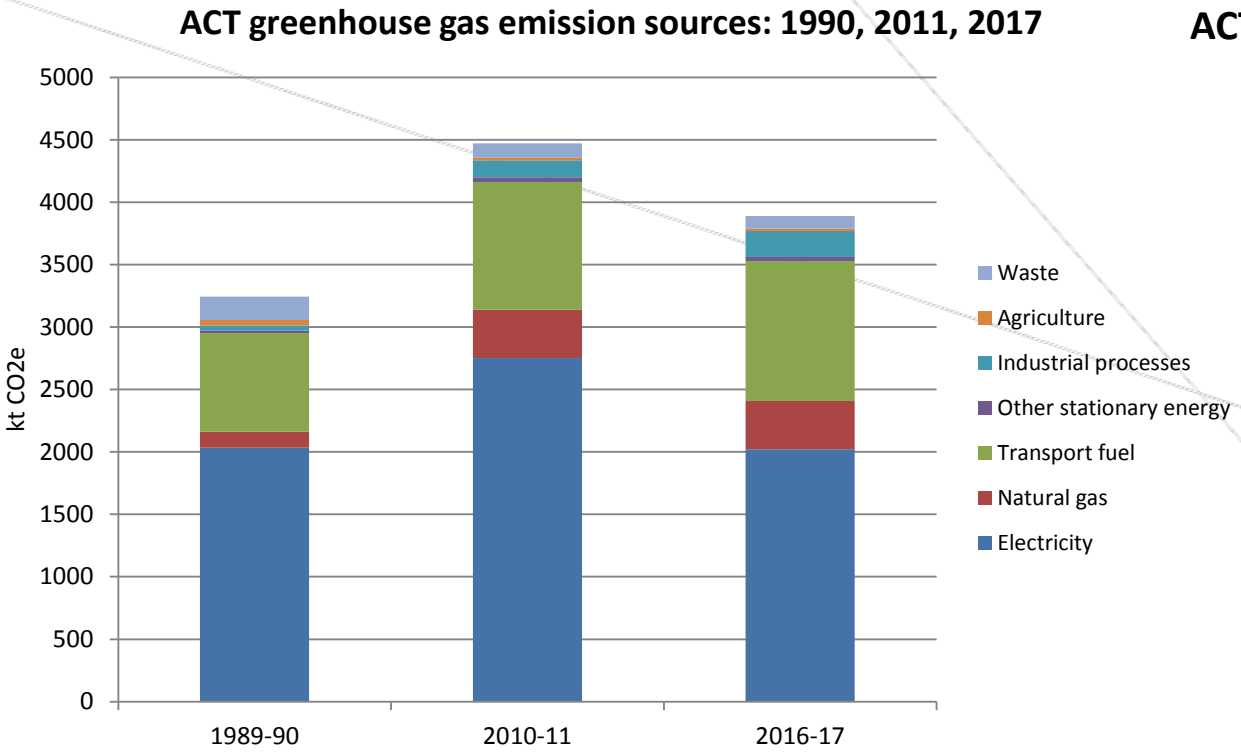
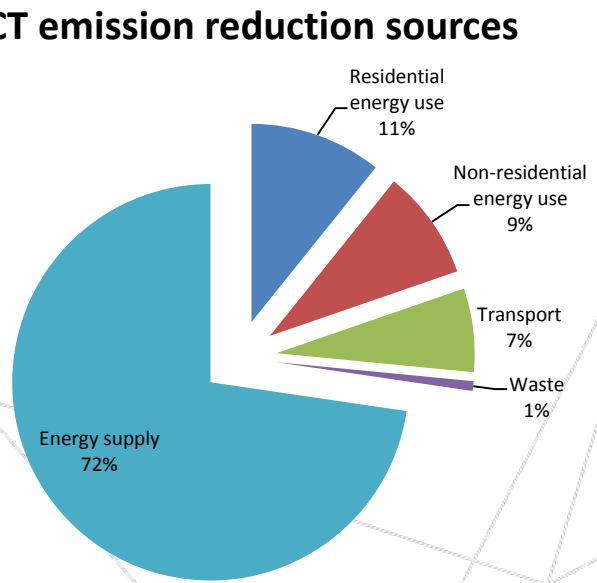
Australia is a high greenhouse gas emitter





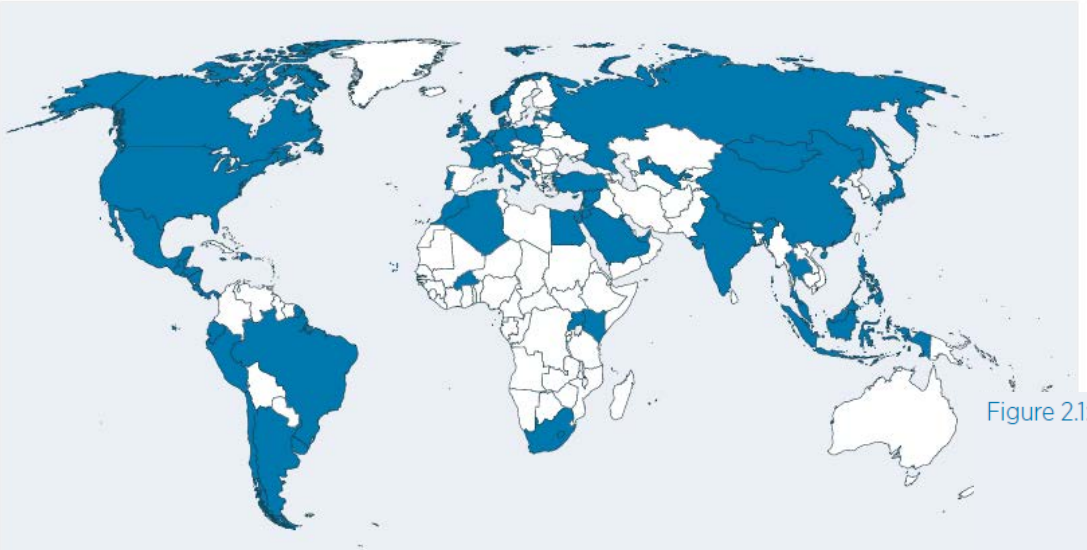
ACT emission sources and emission cuts





Reverse feed-in tariff auctions are increasingly popular around the world

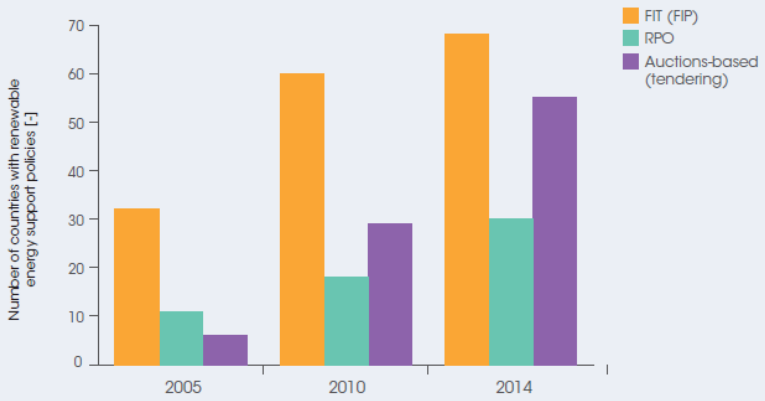
Figure 1.1: Countries that have implemented renewable energy auctions by early 2015 (in blue)



Source: Based on data from REN21, 2015

Number of countries using reverse auctions has increased from 6 in 2005 to at least 67 by 2016

Figure 2.1: Number of countries with renewable energy policies, by type



Source: (REN21, 2014).

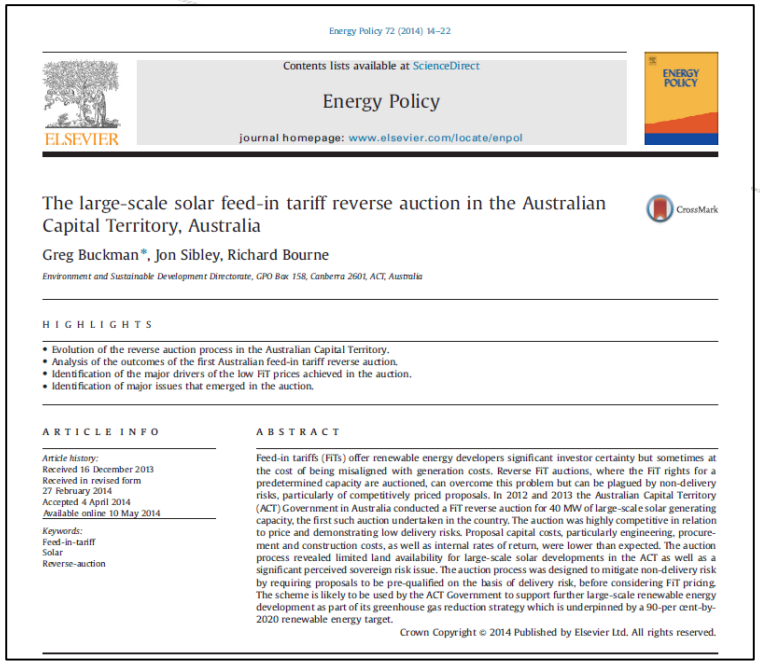
Reverse auction weaknesses and potential remedies

Weakness	Potential remedy
Uncertainty about bid delivery	Delivery bonds, prequalification requirement
Uncertainty about the FiT prices of successful bids	Inherent feature of reverse auctions
High transaction and administration costs	Use of sealed bids, non-indexed FiT prices, streamlined bid document requirements, minimum of non-price assessment criteria
Discouragement of small to medium sized bidder participation	Use of low bid thresholds, minimisation of bid documentation
Locational concentration of successful projects in high resource quality areas	Discrimination against bid concentration

Key ACT reverse auction features

Reverse auction feature	ACT design
Bid submission	Sealed-bid
FiT payment structure, term	'Contract-for-difference', 20 years
FiT payment indexation	None
Technology coverage	Wind or solar apart from 2016 auction that was open to both
Generation or capacity key metric	Capacity was key metric: Maximum and minimum bid capacities were set in all auctions (2 and 20 MW in the 2012/2013 Solar Auction; and between 9 and 109 MW in subsequent auctions)
Prequalification requirements	Some prequalification requirements including that projects must be new and connected to national transmission system
Price or multi criteria assessment	Assessment was based on price and several non-price criteria

ACT reverse auction journal papers



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The large-scale solar feed-in tariff reverse auction in the Australian Capital Territory, Australia

Greg Buckman*, Jon Sibley, Richard Bourne

Environment and Sustainable Development Directorate, GPO Box 158, Canberra 2601, ACT, Australia

HIGHLIGHTS

- Evolution of the reverse auction process in the Australian Capital Territory.
- Analysis of the outcomes of the first Australian feed-in tariff reverse auction.
- Identification of the major drivers of the low FiT prices achieved in the auction.
- Identification of major issues that emerged in the auction.

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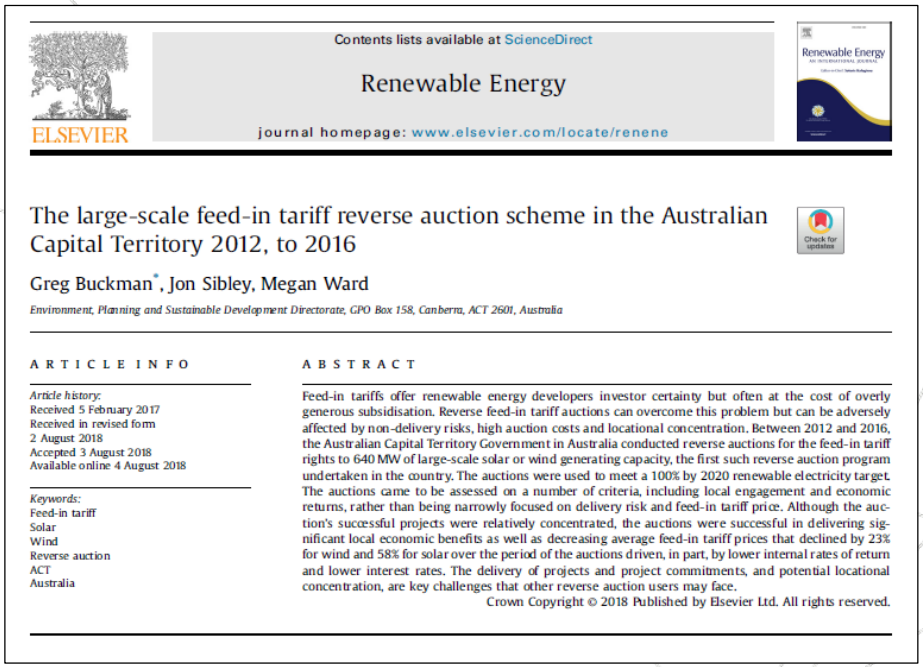
ABSTRACT

Feed-in tariffs (FiTs) offer renewable energy developers significant investor certainty but sometimes at the cost of being misaligned with generation costs. Reverse FiT auctions, where the FiT rights for a predetermined capacity are auctioned, can overcome this problem but can be plagued by non-delivery risks, particularly of competitively priced proposals. In 2012 and 2013 the Australian Capital Territory (ACT) Government in Australia conducted a FiT reverse auction for 40 MW of large-scale solar generating capacity, the first such auction undertaken in the country. The auction was highly competitive in relation to price and demonstrating low delivery risks. Proposal capital costs, particularly engineering, procurement and construction costs, as well as internal rates of return, were lower than expected. The auction process revealed limited land availability for large-scale solar developments in the ACT as well as a significant perceived sovereign risk issue. The auction process was designed to mitigate non-delivery risk by requiring proposals to be pre-qualified on the basis of delivery risk, before considering FiT pricing. The scheme is likely to be used by the ACT Government to support further large-scale renewable energy development as part of its greenhouse gas reduction strategy which is underpinned by a 90-per cent-by-2020 renewable energy target.



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The large-scale feed-in tariff reverse auction scheme in the Australian Capital Territory 2012, to 2016

Greg Buckman*, Jon Sibley, Megan Ward

Environment, Planning and Sustainable Development Directorate, GPO Box 158, Canberra, ACT 2601, Australia

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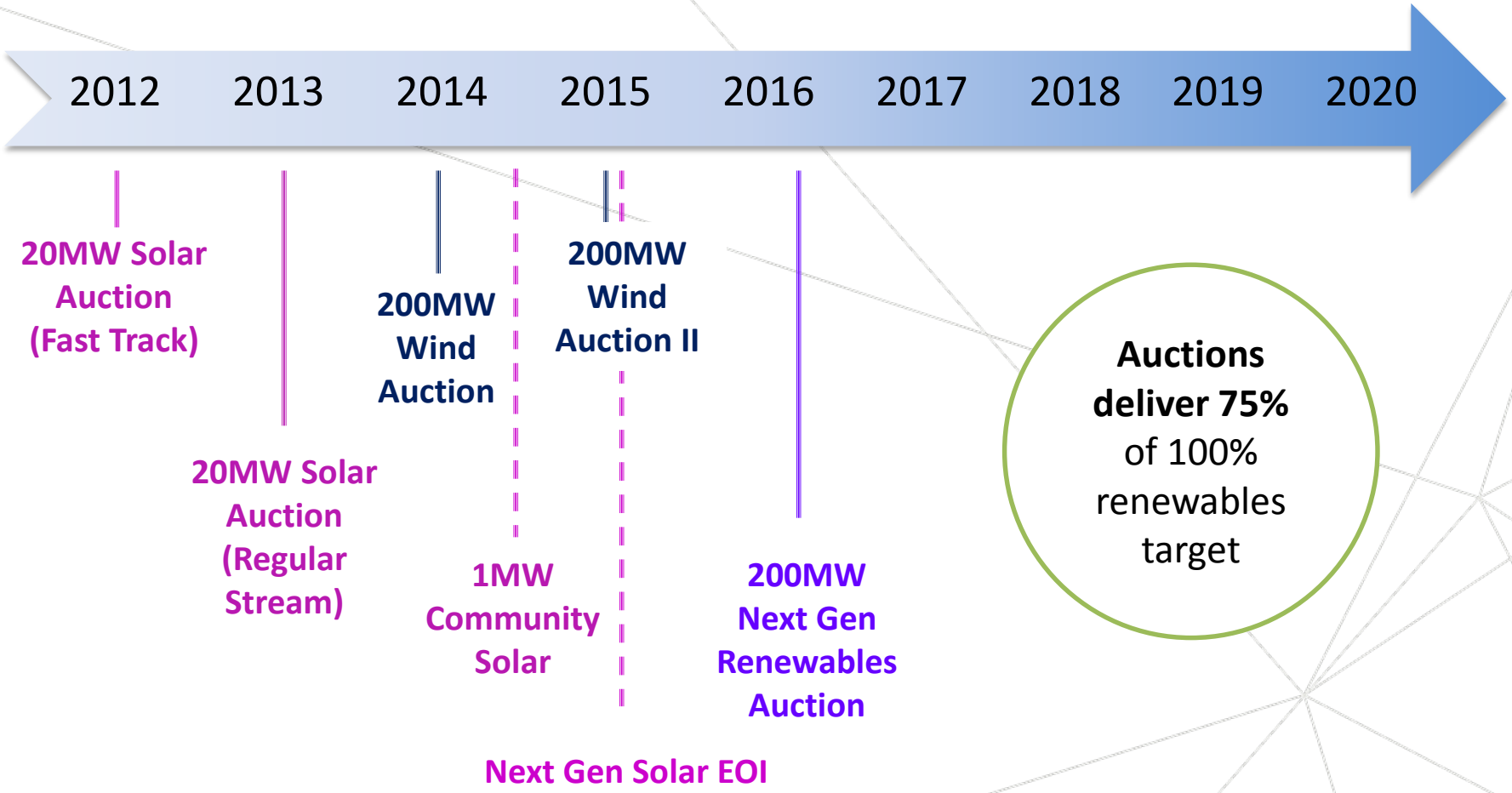
ABSTRACT

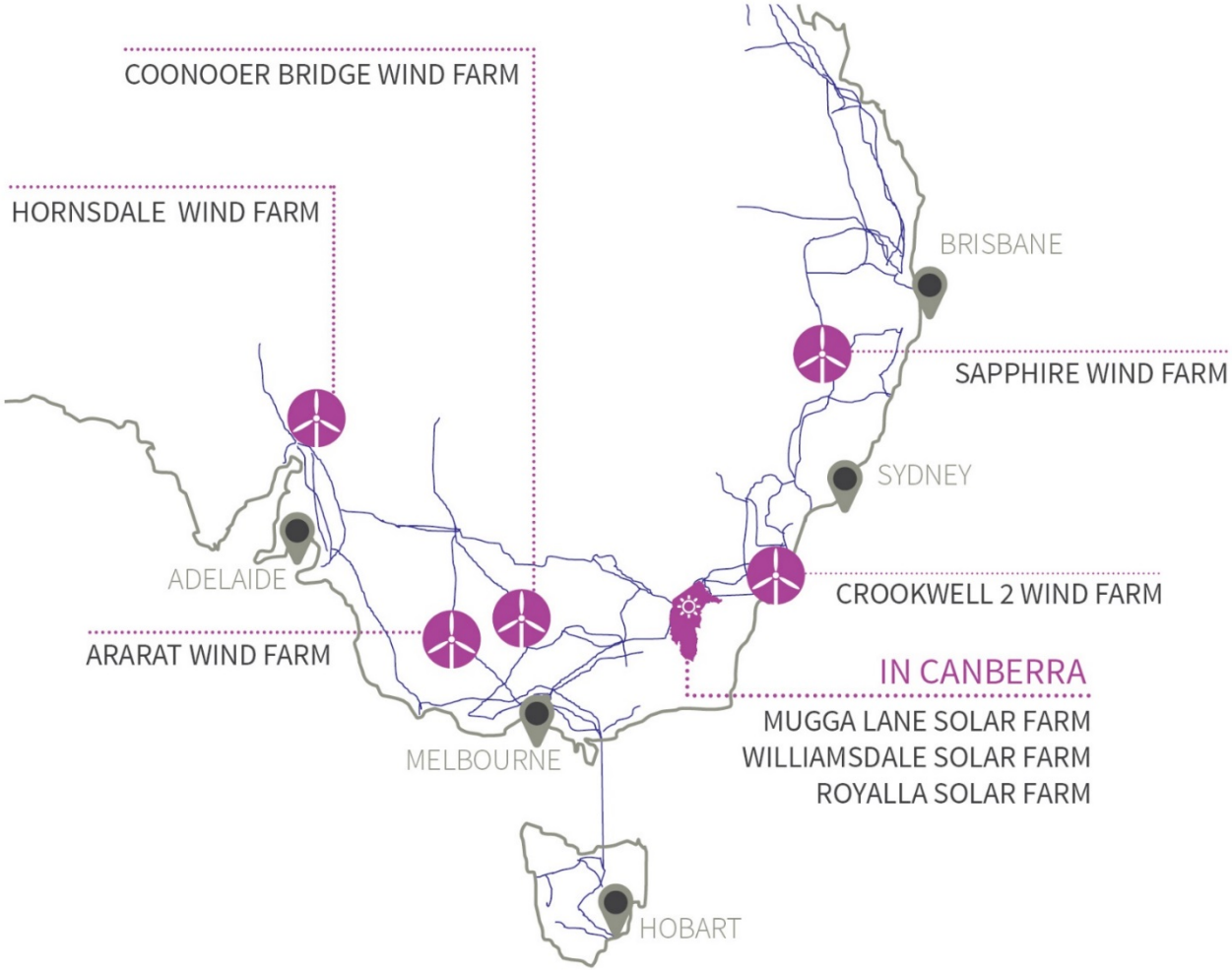
Feed-in tariffs offer renewable energy developers investor certainty but often at the cost of overly generous subsidisation. Reverse feed-in tariff auctions can overcome this problem but can be adversely affected by non-delivery risks, high auction costs and locational concentration. Between 2012 and 2016, the Australian Capital Territory Government in Australia conducted reverse auctions for the feed-in tariff rights to 640 MW of large-scale solar or wind generating capacity, the first such reverse auction program undertaken in the country. The auctions were used to meet a 100% by 2020 renewable electricity target. The auctions came to be assessed on a number of criteria, including local engagement and economic returns, rather than being narrowly focused on delivery risk and feed-in tariff price. Although the auction's successful projects were relatively concentrated, the auctions were successful in delivering significant local economic benefits as well as decreasing average feed-in tariff prices that declined by 23% for wind and 58% for solar over the period of the auctions driven, in part, by lower internal rates of return and lower interest rates. The delivery of projects and project commitments, and potential locational concentration, are key challenges that other reverse auction users may face.

ACT renewables investment program



Auctions deliver 75% of 100% renewables target

LOCATION OF CANBERRA'S WIND AND SOLAR FARMS WITHIN THE NATIONAL ELECTRICITY MARKET



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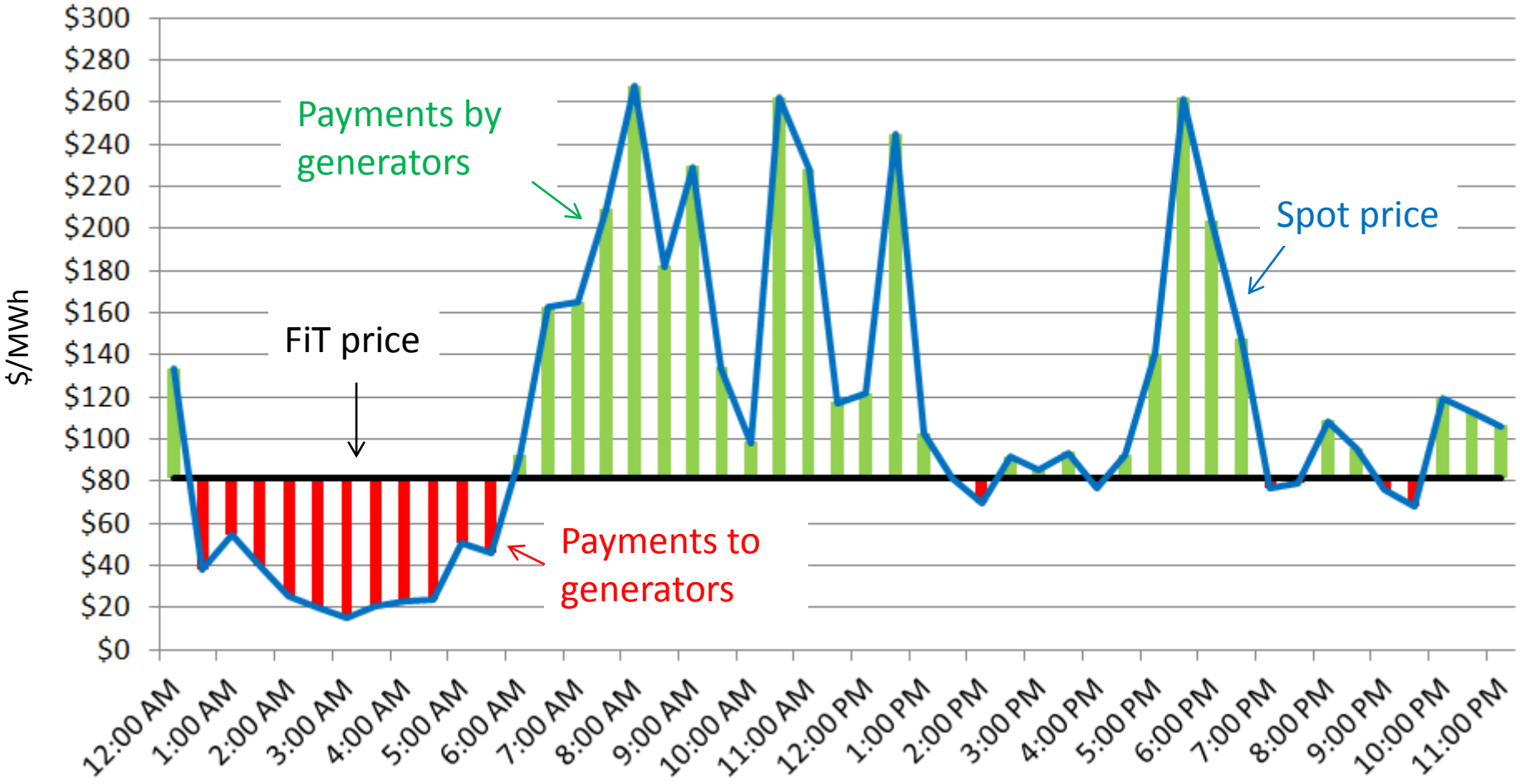
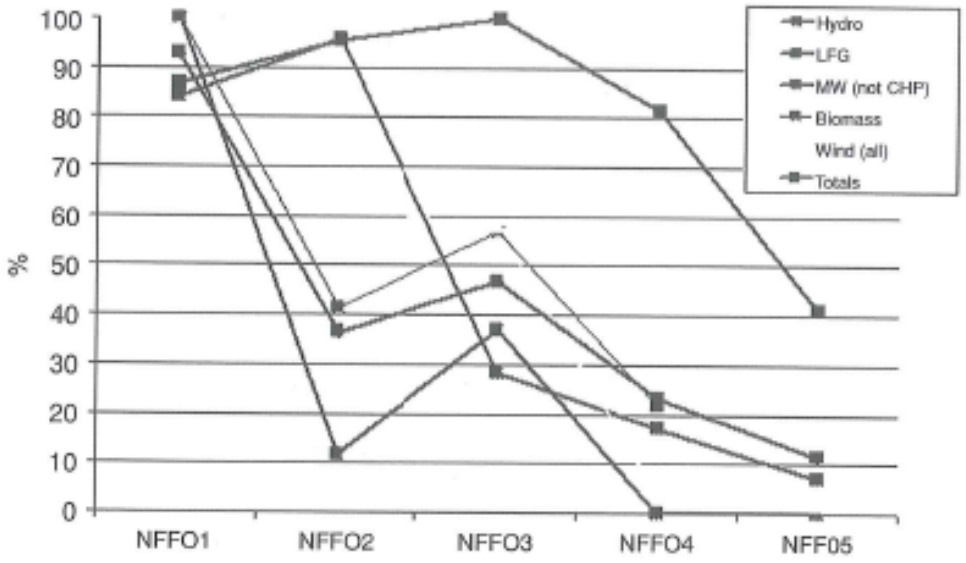
ACT reverse auctions

Reverse auction	Maximum auction FiT entitlement capacity MW(AC)	Eligible technologies	Number of submitted proposals	Total capacity of all submitted proposals – MW(AC)	Average proposal capacity – MW(AC)
Solar Auction fast-track stream	20	Solar	10	110.0	11.0
Solar Auction regular stream	20	Solar	15	108.9	7.3
First Wind Auction	200	Wind	18	1,312.4	72.9
Second Wind Auction	200	Wind	15	1,154.7	77.0
Next Generation Renewables Auction	200	Solar and wind	15	1,078.0	71.9

Contract for difference payments



Times have changed: UK 1990s experience with reverse auctions was poor



Source: Hartnell, 2003.

Figure 7.1 Overall completion rates for the NFFO

Renewable energy policy objectives

Reduce greenhouse gas emissions

- Invest in large-scale renewables
- Reduce barriers to solar and battery storage
- Demonstrate emerging technology

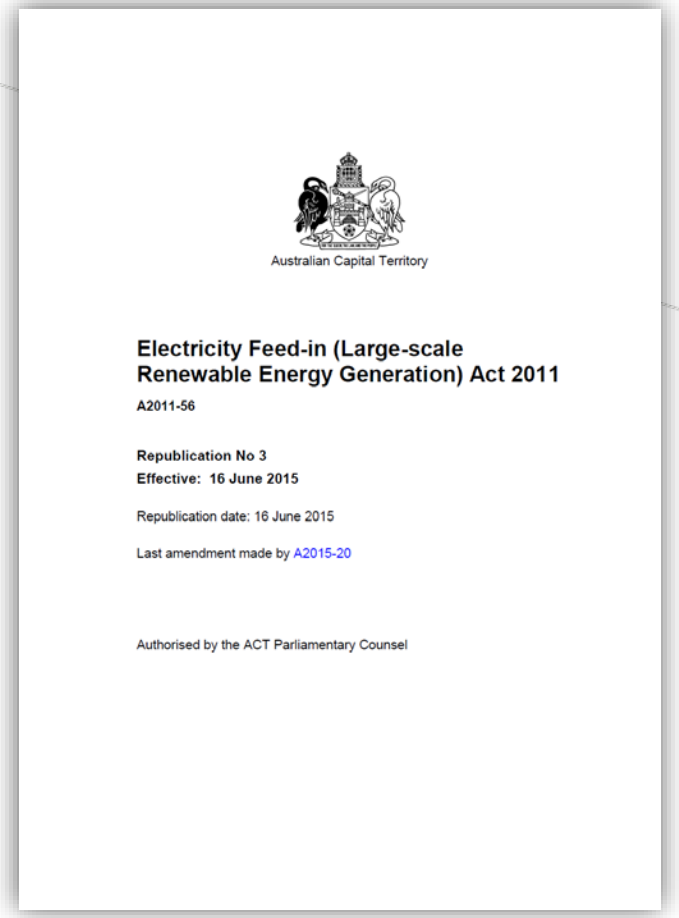
CBR as a national energy innovation hub

- Support start-ups and business innovation
- Trades training development
- New research collaborations

ACT Government

Auction rules and legislation

Feed-in Tariff legislation



Australian Capital Territory

Electricity Feed-in (Large-scale Renewable Energy Generation) Act 2011

A2011-56

Republication No 3
Effective: 16 June 2015

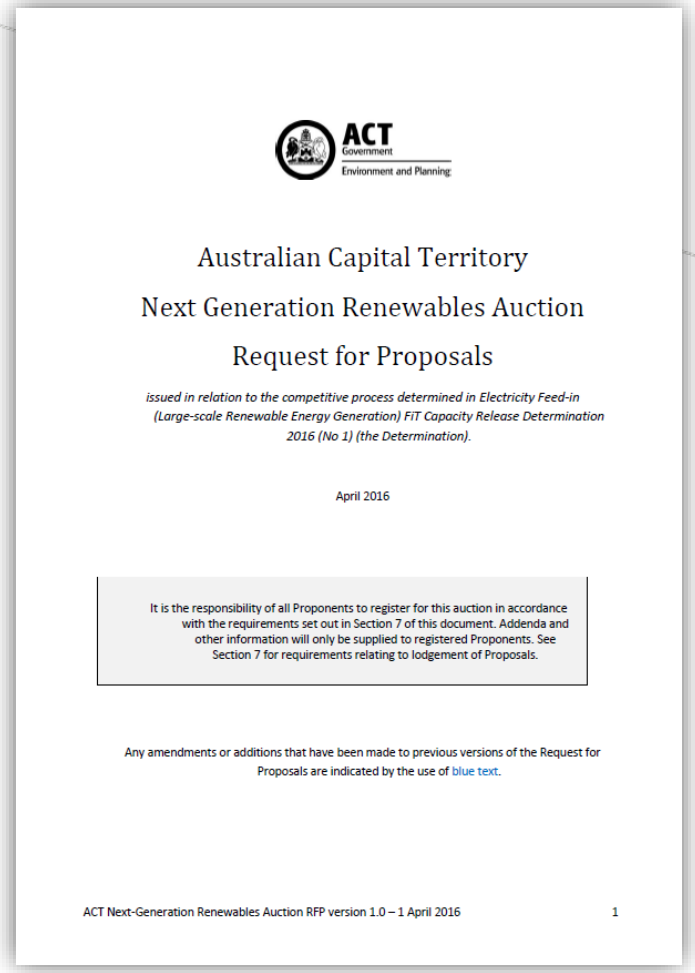
Republication date: 16 June 2015

Last amendment made by A2015-20

Authorised by the ACT Parliamentary Counsel

- Legislation passed in December 2011
- amended in 2014, 2015, 2016 & 2017
- Allows Minister to grant Feed-in Tariffs to large-scale (>200kW) renewable energy generators up to a total cap of 650MW
- Cost recovery through Distributor
- Projects can be located anywhere in the NEM
- Non-ACR projects must offer exceptional economic benefits and minimise cost to ACT electricity consumers

Auction Rules



ACT Government
Environment and Planning

Australian Capital Territory

Next Generation Renewables Auction

Request for Proposals

issued in relation to the competitive process determined in Electricity Feed-in (Large-scale Renewable Energy Generation) FiT Capacity Release Determination 2016 (No 1) (the Determination).

April 2016

It is the responsibility of all Proponents to register for this auction in accordance with the requirements set out in Section 7 of this document. Addenda and other information will only be supplied to registered Proponents. See Section 7 for requirements relating to lodgement of Proposals.

Any amendments or additions that have been made to previous versions of the Request for Proposals are indicated by the use of blue text.

ACT Next-Generation Renewables Auction RFP version 1.0 – 1 April 2016 1

Request for Proposal

Governs auction process

Generates advice to the Minister on which package of proposals constitute the best value for money

Comes with forms for proponents to complete

Subject to addenda throughout the process

FiT summary

- FiT is firm, fixed and flat over 20 years on a $/MWh basis
- Paid by ACT electricity distributor (ActewAGL Distribution)
- Eligible electricity is the lesser of actual generation or LGC creation
- Consideration of transmission or distribution losses
- FiT is paid based on FiT value less the 30 min settlement value of electricity in the relevant NEM spot market
- This does not preclude the generator selling to a market participant (although their is no risk to trade)

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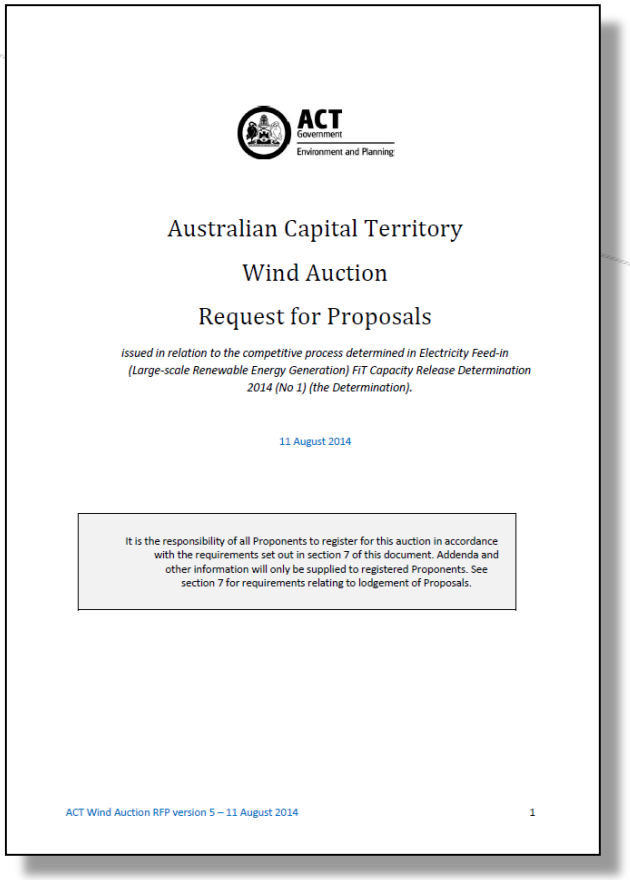
Auction evaluation

Proposal Evaluation Criteria



ACT Government
Environment and Planning

Australian Capital Territory

Wind Auction

Request for Proposals

issued in relation to the competitive process determined in Electricity Feed-in (Large-scale Renewable Energy Generation) FiT Capacity Release Determination 2014 (No 1) (the Determination).

11 August 2014

It is the responsibility of all Proponents to register for this auction in accordance with the requirements set out in section 7 of this document. Addenda and other information will only be supplied to registered Proponents. See section 7 for requirements relating to lodgement of Proposals.

ACT Wind Auction RFP version 5 – 11 August 2014 1

Proposal Evaluation Criteria (PREV)		Weighting
EV1	Risks to timely project completion	50%
EV2	Local community engagement	20%
EV3	ACT economic development benefits	20%
EV4	Reliance on Treasury Financial Guarantee	10%

ACT Government

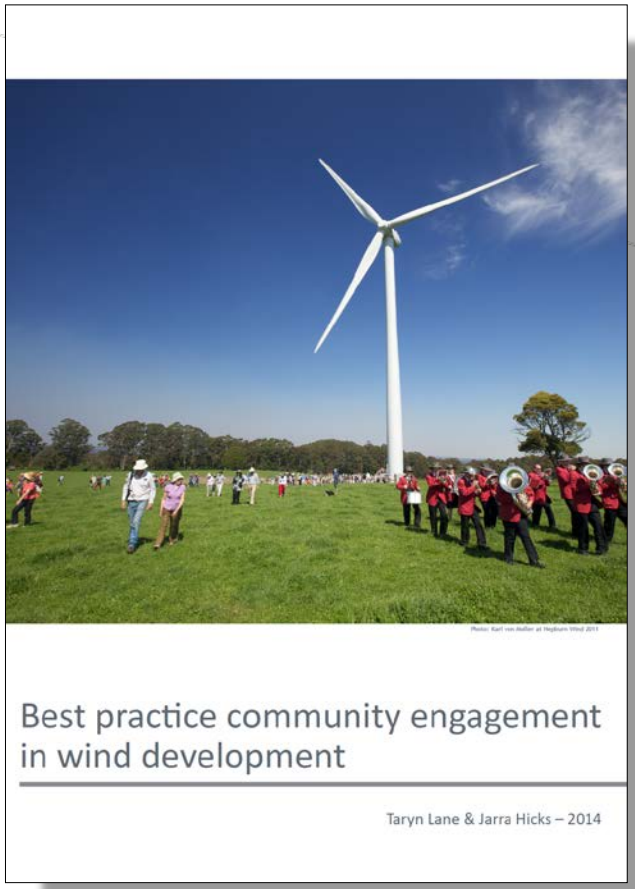
EV1 – Risks to Timely Project Completion

Mitigates risk to Territory of Proposal non-delivery

EV1 includes consideration of:

- proponent capability and experience and understanding of the legal and regulatory environment
- access to funds/ability to raise funds and inclusion of a detailed income, expenditure and generation forecast
- technology and construction or other risks
- advanced stage of preparation/development approval
- realistic development timeframe

EV2 – Local Community Engagement



- Proponents must lodge a Community Engagement Plan detailing:
  - Planning and processes
  - Outcomes
- Best practice community engagement in wind development provided for information only
- Mitigates risk to Territory of Proposal non-delivery
- Mitigates risk of adverse community impacts
- Supports continuous improvement in industry practices

EV3 – ACT economic development benefits

ACT Government | CBR CANBERRA

Renewable Energy Local Investment Framework

Vision

Canberra has a vision of becoming a internationally recognised centre for renewable energy innovation and investment.

Investment proposition

Canberra is a dynamic, knowledge-based economy situated in the heart of one of Australia's fastest growing regions for renewable energy investment – the Australian Capital Region. The ACT has set a 90% renewable energy target to be achieved by 2020 through targeted investments in solar, wind and biomass. The ACT is also home to Tertiary institutions with world-class research capabilities and experience in energy technology, economics and policy.

In pursuit of the ACT's renewable energy target, the ACT Government has developed a legislated feed-in tariff mechanism and reverse auction process that provides a high degree of investment certainty for project developers and financiers. Already, 40MW of projects have been successful in being awarded feed-in tariffs, including Australia's largest (20MW) photovoltaic generating facility, to be completed by mid 2014. An additional 450 megawatts are expected to be awarded before 2020.

A renewable energy business situated in the ACT has access to:

- One of Australia's fastest growing renewable energy investment regions
- A supportive policy/investment environment
- A highly skilled labour force and strong local business capability
- Australian Government funding bodies and contracts
- Strong and experienced research and development institutions
- An established network of renewable energy stakeholders
- Strong community support for environmental initiatives

Investment priorities

The ACT Government has identified the following four priority areas for renewable energy business development and investment attraction to stimulate sustained job creation in the Territory. Renewable energy companies seeking support under the ACT's large-scale feed-in tariff legislation will be required to demonstrate how their proposals and businesses contribute to these priorities.

1. Deliver enduring benefits to local businesses through the inclusion of regional contractors and labour force
2. Build Canberra's capacity as a national tertiary education and trades' skills hub
3. Stimulate productive research partnerships that will develop the capacity and global recognition of our tertiary institutions
4. Grow the local corporate footprint of national and international businesses

The ANU Energy Change Institute undertakes pioneering research on energy technology, policy and economics.

Photo: The ANU conducts state-of-the-art laser processing for photovoltaics

Local investment requirements

- All Proponents must lodge an ACT Investment Plan addressing Renewable Energy Local Investment Framework Priorities, including:
  - Deliver long term sustainable job creation and industry development
  - Firm commitments
- Projects outside the ACR must be 'exceptional'
- Non-ACR proposals have to be in top 20% of all proposals
- Flexible, outcomes-focussed

EV4 – Reliance on Compensation Clause

- Transitional measure to improve bankability for Proponents
- Applies only in relation to a Territory change in law
- Set to approximate debt exposure (not intended to provide full coverage)
- Capped at $1.23m/MW (early solar: $1.75/MW)(of proposal capacity)
- Declines linearly to zero over 20 years
- Automatic evaluation:
  - $0/MW gets score of 10/10
  - $1.23m/MW gets 0/10

ACT Government

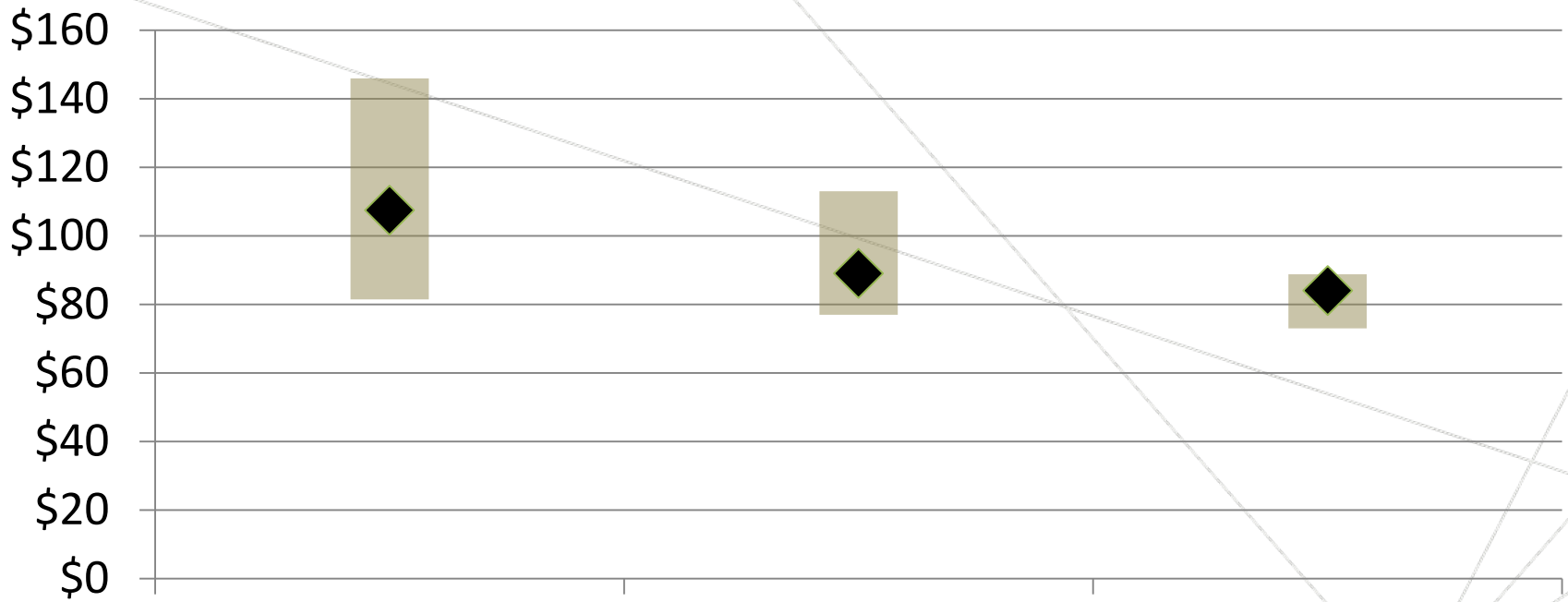
ACT Auction outcomes

ACT reverse auction winners

Reverse auction	Proposal generator name	Total proposal capacity-MW(AC)	Proposal FiT price - $A/MWh	Proposal FiT grant commencement month	Proposal state/territory location
Solar Auction fast-track stream	Royalla Solar Farm	20	$A186.00	March 2014	ACT
Solar Auction regular stream	Williamsdale Solar Farm	7	$A186.00	April 2015	ACT
	Mugga Lane Solar Park	13	$A178.00	October 2014	ACT
First Wind Auction	Ararat Wind Farm	80.5	$A87.00	April 2017	Victoria
	Coonooer Bridge Wind Farm	19.4	$A81.50	February 2016	Victoria
	Hornsdale Wind Farm Stage 1	100	$A92.00	February 2017	South Australia
Second Wind Auction	Sapphire Wind Farm Stage 1	100	$A89.10	May 2018	New South Wales
	Hornsdale Wind Farm Stage 2	100	$A77.00	December 2018	South Australia
Next Generation Renewables Auction	Crookwell 2 Wind Farm	91	$A86.60	September 2018	New South Wales
	Hornsdale Wind Farm Stage 3	109	$A73.00	October 2019	South Australia

ACT wind auctions recorded lower FiT prices

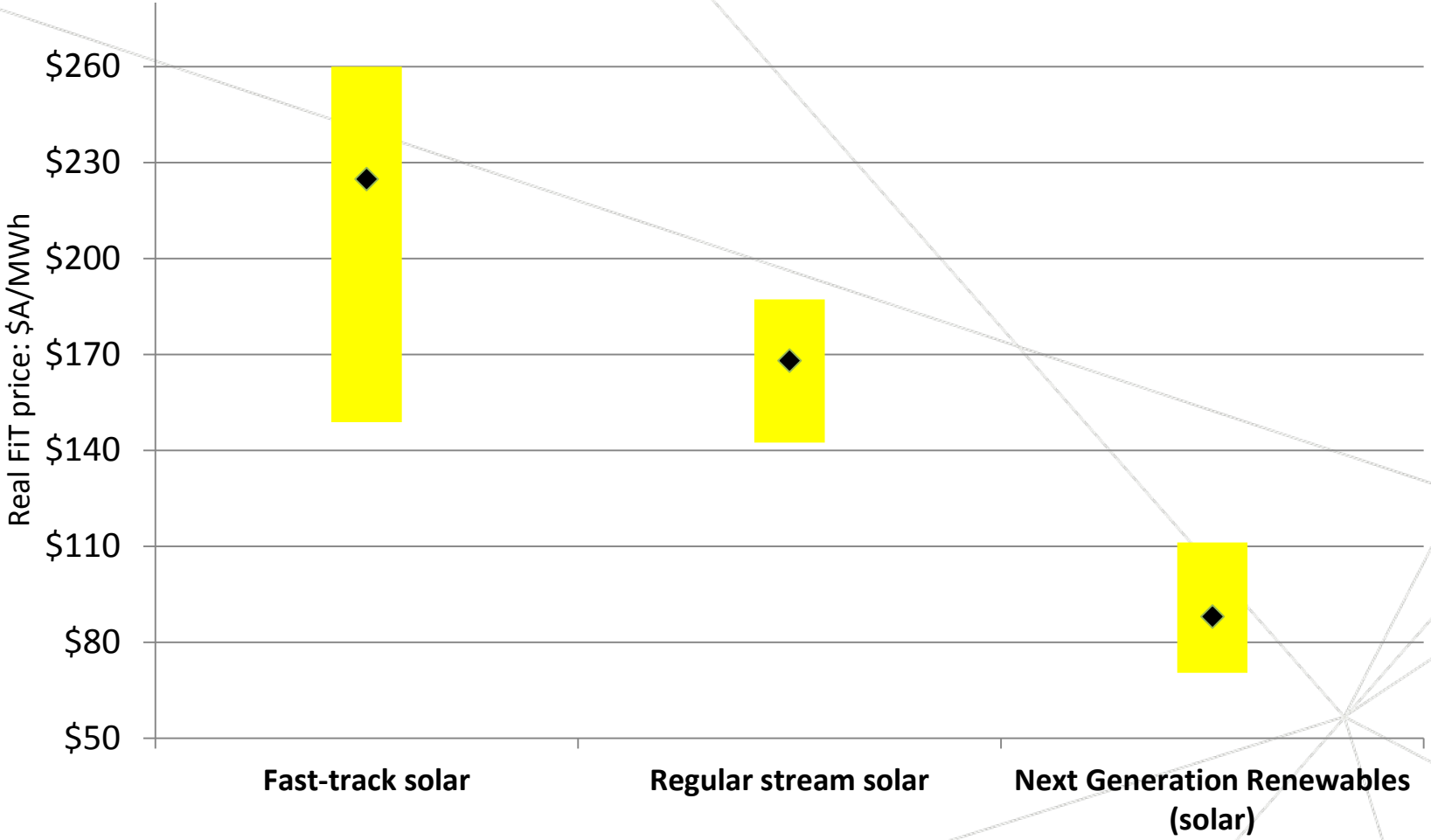
Range of FiT prices (fixed nominal for 20 years) and median price



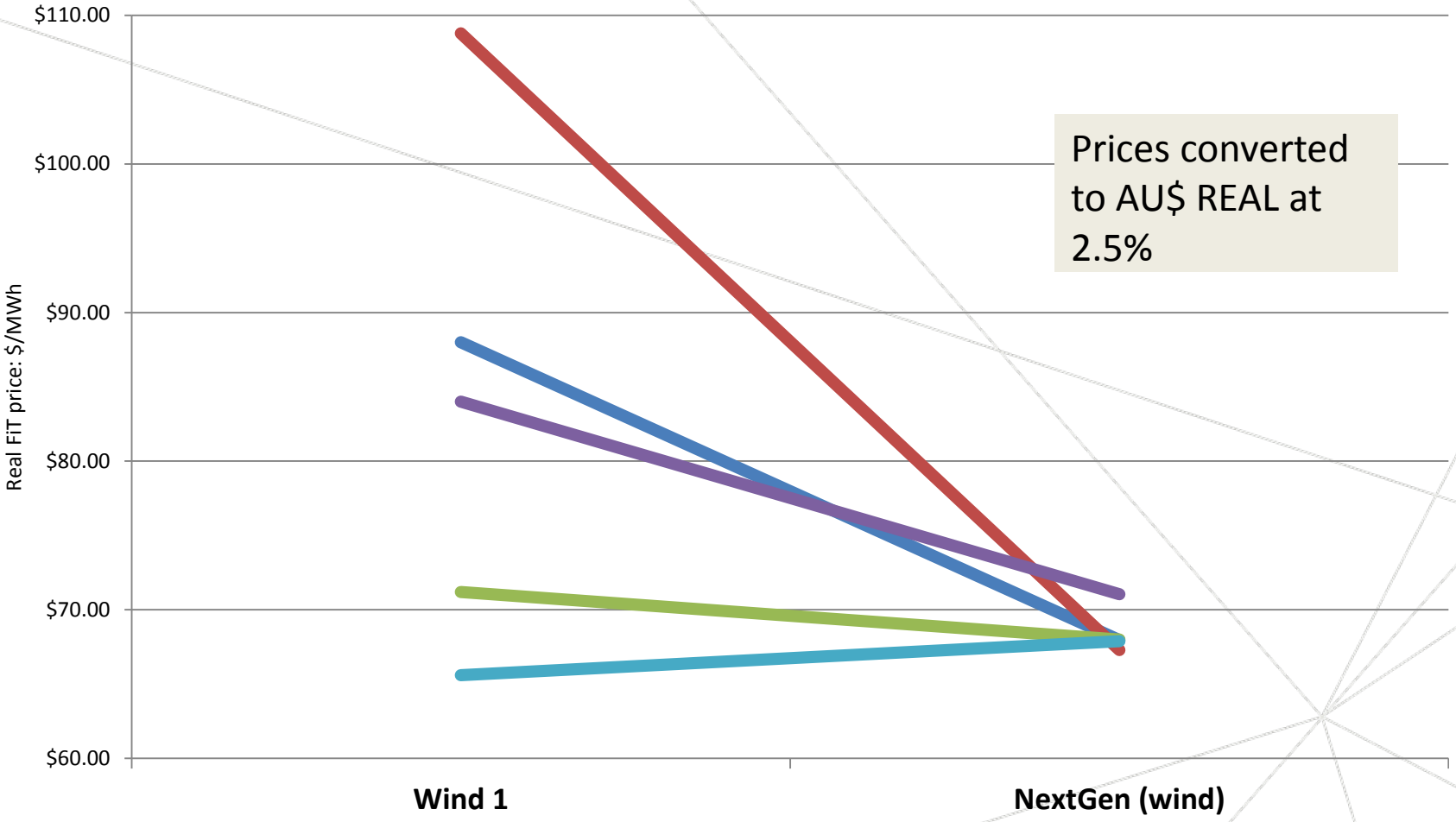
	Wind 1	Wind 2	NextGen (Wind)
Year	*2014*	*2015*	*2016*
N = 18	*18*	*15*	*19*
MW (average)	*72.9*	*77*	*84.9*

ACT solar auctions recorded lower FiT prices

Range of FiT prices (fixed nominal for 20 years) and median price

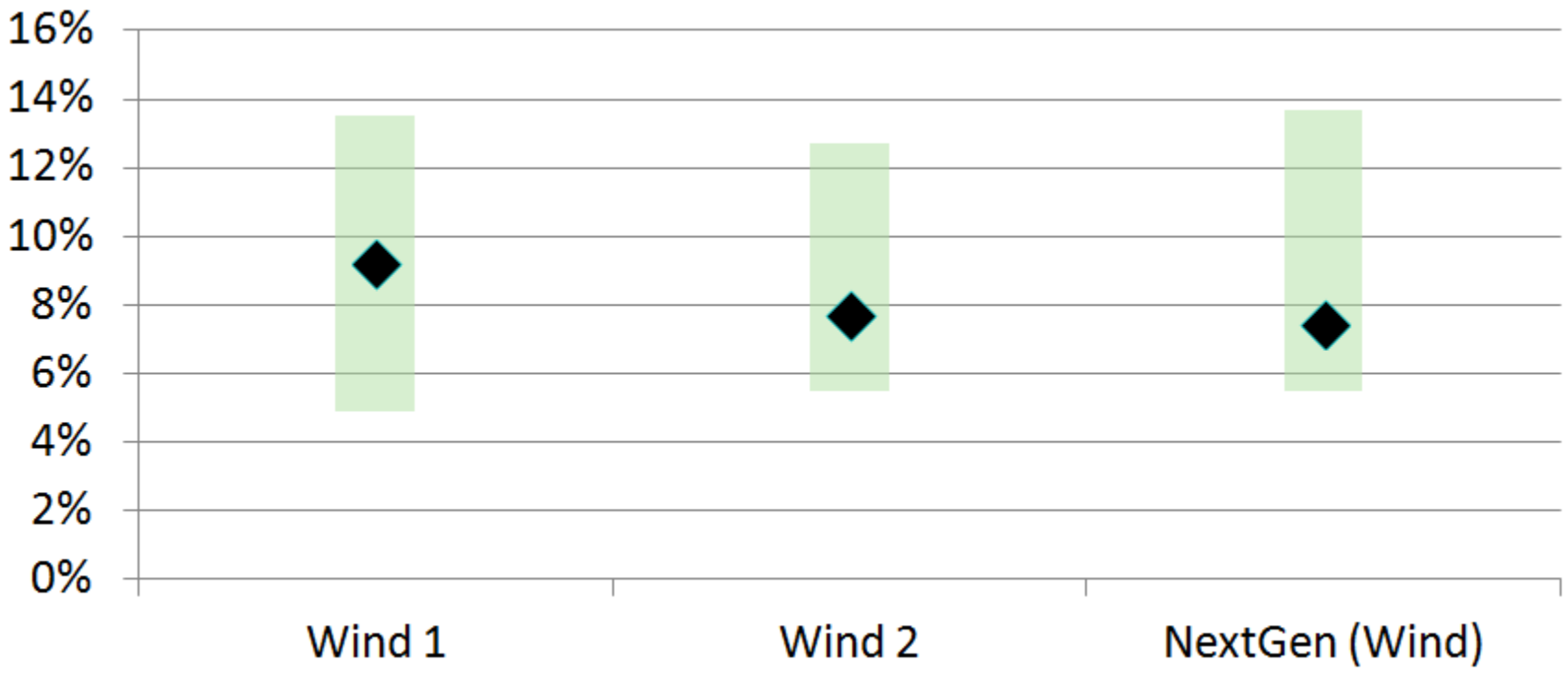


Wind rebid FiT prices came down



Internal rate of return (IRR) price driver

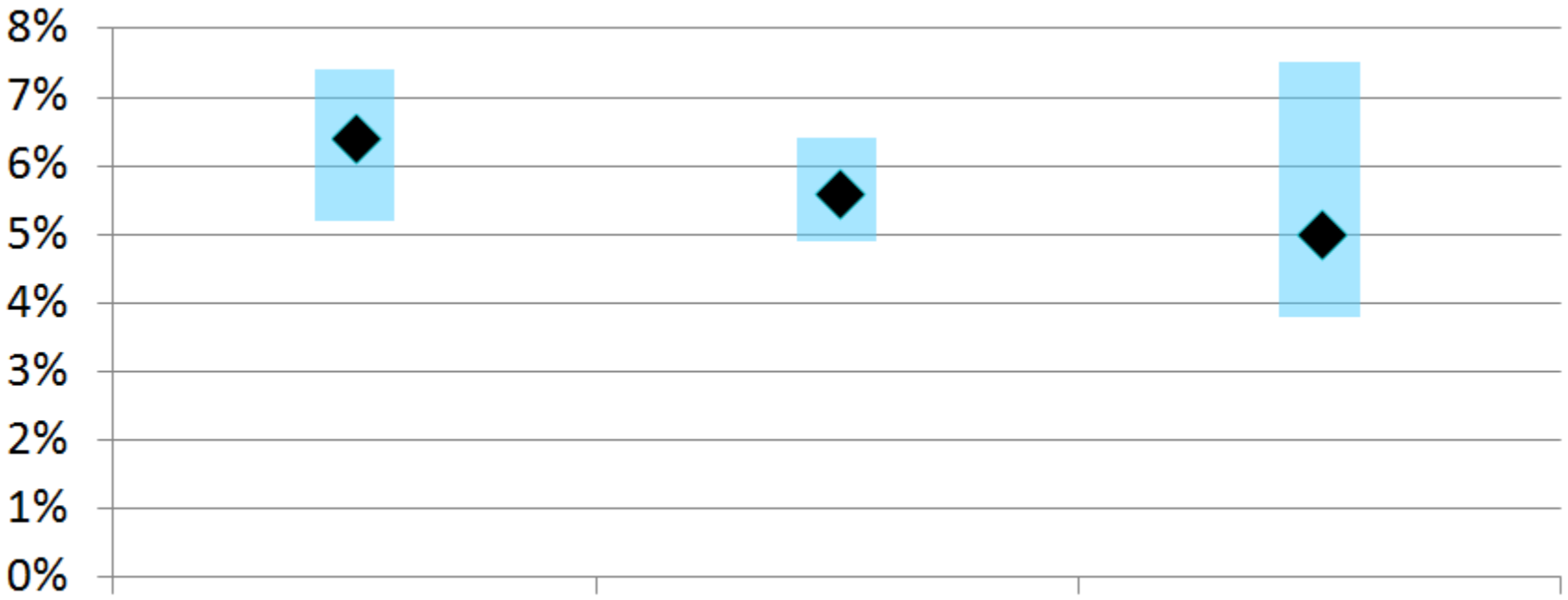
Range of IRR and median IRR



	Wind 1	Wind 2	NextGen (Wind)
Year	*2014*	*2015*	*2016*
N =	*18*	*15*	*9*
MW (average)	*72.9*	*77*	*84.9*

Range of wind debt rates and median rate

Debt costs (base rate + margin)



	Wind 1	Wind 2	Wind 3
Year	*2014*	*2015*	*2016*
N = 18	*18*	*15*	*19*
MW (average)	*72.9*	*77*	*84.9*

ACT Government

Leveraging for innovation

Tracking outcomes: Over $500 million in local economic benefits

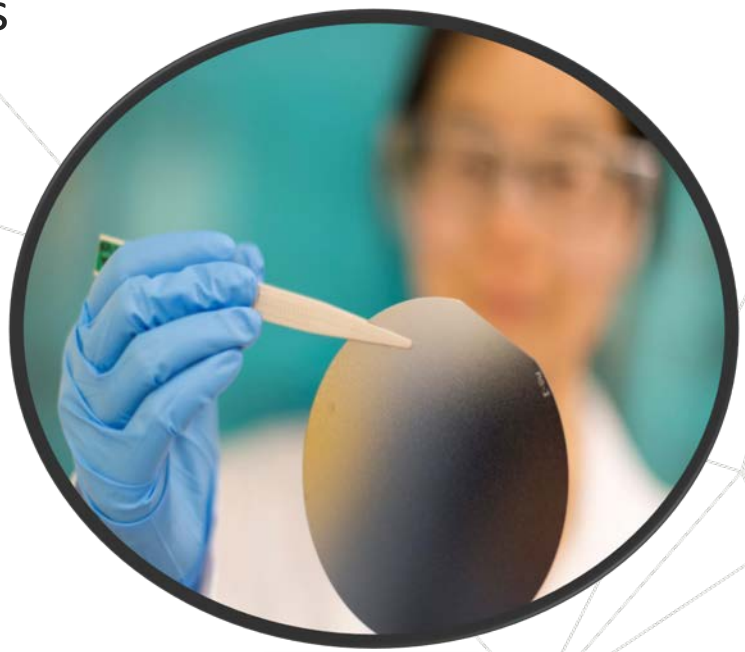
Four national & international company HQs

Trades training & use of local contractors

Tertiary research and education

New technology demonstration

- Solar battery storage roll-out
- Hydrogen trial

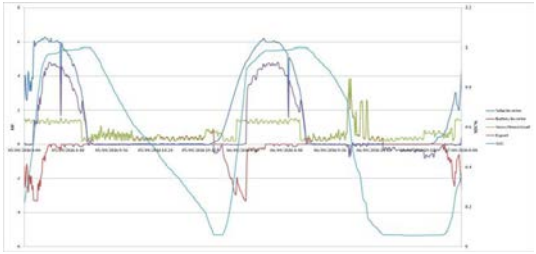


Next Gen Energy Storage Grants

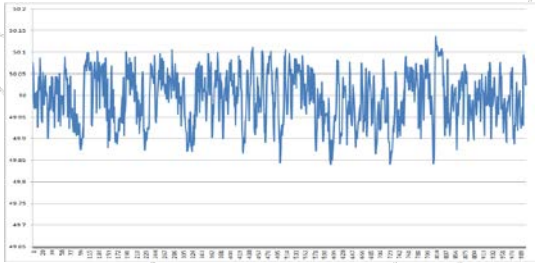
$25 million in <u>industry</u> funding

- Up to 5000+ homes & businesses to 2020
- Up to 36MW
- Focus on ‘sustained peak output’
- Capacity to respond to price signals
- Data capture for R&D
- Enabling Virtual Power Plant

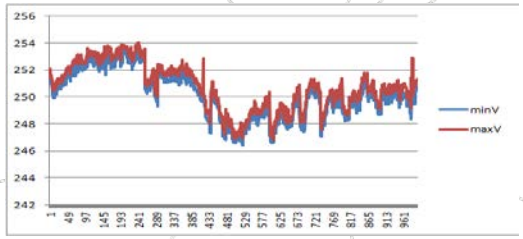
Power flows



Network freq.

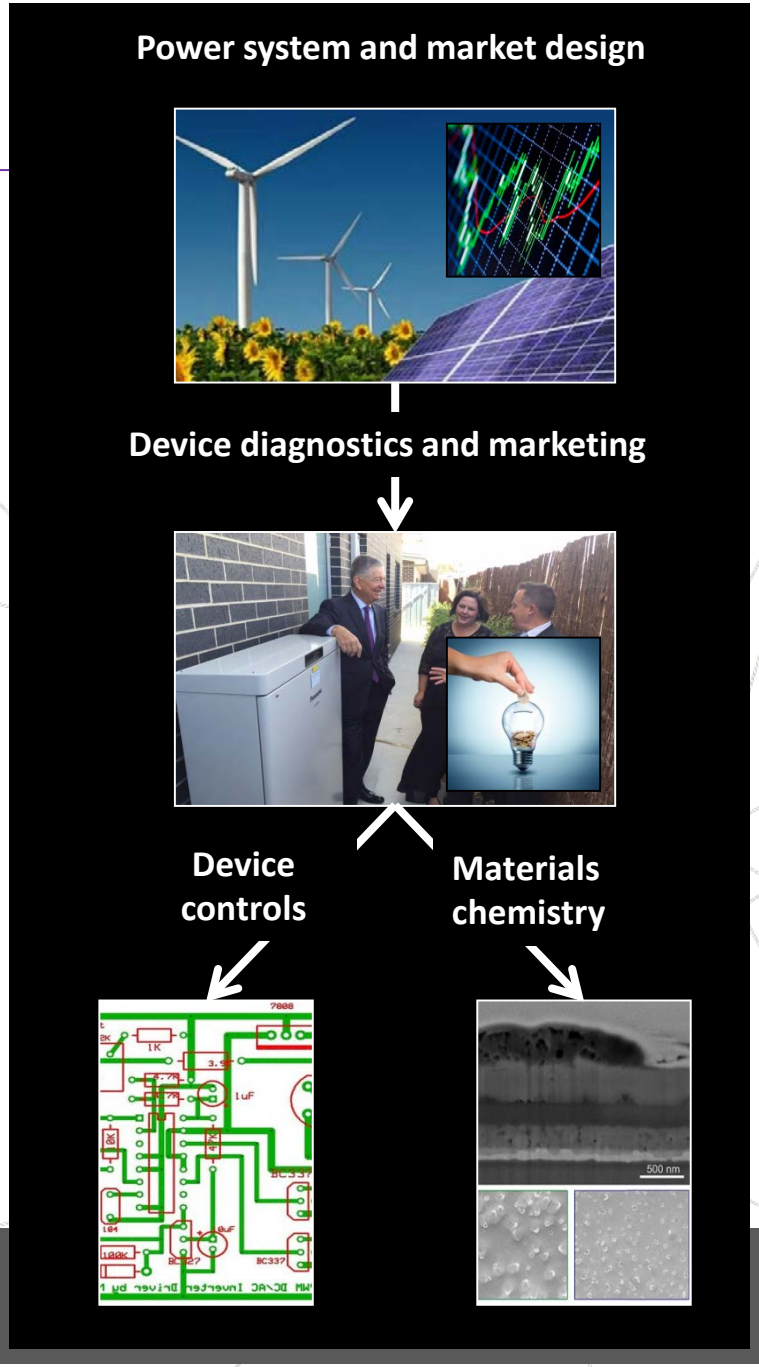


Network voltage



Battery storage integration

- Partnership with **Australian National University**
- **$8M over 5 years** to establish global research leadership capability
- **Integrated program** covering power system to diagnostics and materials chemistry
- Focus on **applied research partnerships** with ACT business and corporate community
- Linking Australian and global storage research capability



<2° DEGREES RENEWABLES INNOVATION HUB

1,100m^2 **collaborative working space**

74 member organisations

Networking opportunities

Events (98 to date, >2,000 participants)

Support services for businesses

Easy access to **Government and Universities**

2 x Funding Schemes
Demonstration and scale-up of new technologies and ventures

- REIF Direct Grants: >$30,000
- Innovation Connect: <$30,000

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Questions?