Renewables in WA

Nathan Ling

2 October 2018

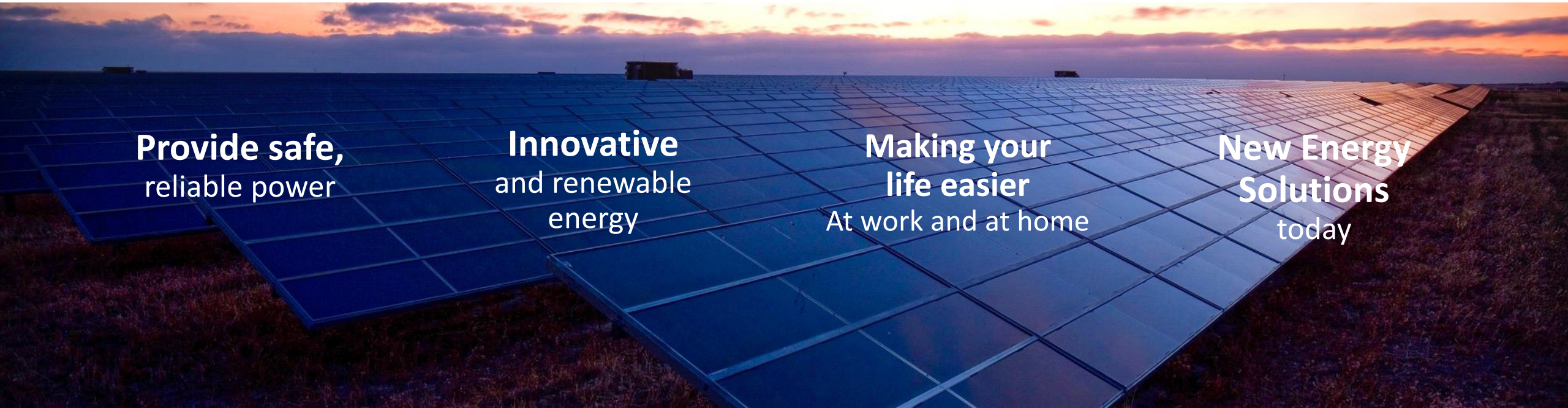
Synergy – leading the way

Supply 55%
of the electricity
supplied to homes and business in the SWIS

8,000 GWh
of electricity generation
from 15 sites

1 million
Residential and
business customers

760+
employees



Provide safe,
reliable power

Innovative
and renewable energy

Making your life easier
At work and at home

New Energy Solutions
today

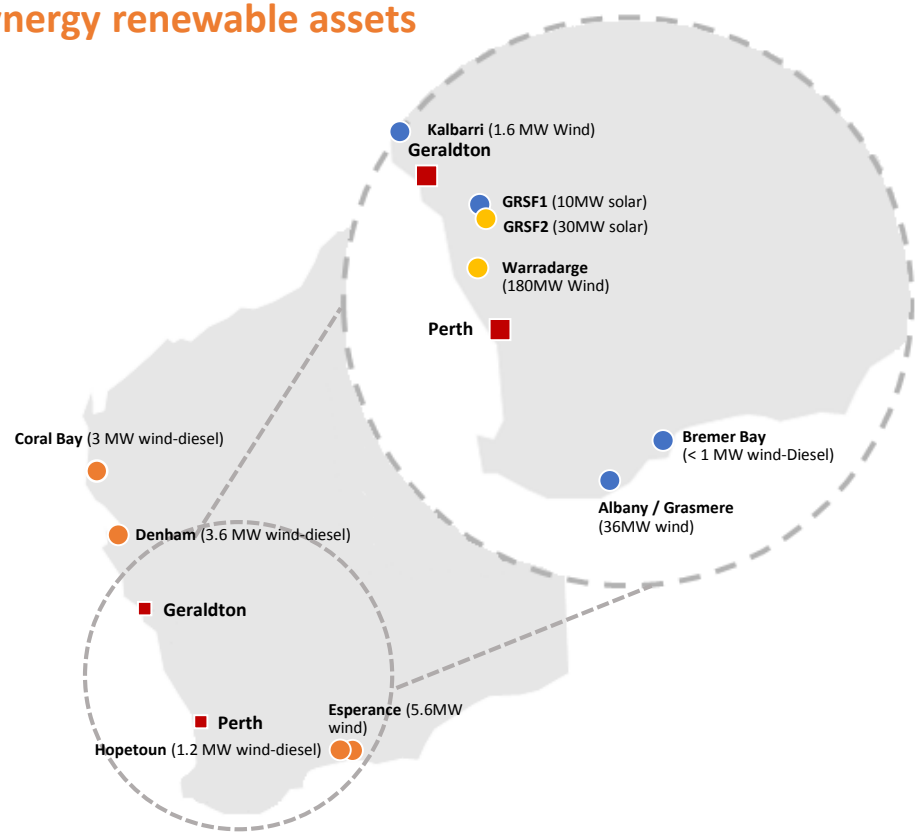
Renewables in Western Australia

Six years ago, there was just 10MW of utility-scale solar in the whole of Australia – the Greenough River Solar Farm, a Verve Energy project. Synergy continues to pioneer the transition to renewables today

SWIS renewable assets

Asset	Type	Capacity (MW)
Operating		**514**
Collgar	Wind	206
Walkaway	Wind	89
Emu Downs	Wind & Solar	80 (20)
Mumbida	Wind	55
Albany Grasmere	***Wind***	***35***
Greenough River 1	***Solar***	***10***
Various	Landfill gas	17
Various	Wind	16
Various	Biogass	5
Various	Solar	1
Under Development		**710**
Warradarge	***Wind***	***180***
Yandin	Wind	210
Badgingarra	Wind	130
Merriden	Solar	120
Greenough River 2	***Solar***	***30***
Byford Solar	Solar	30
Northam	Solar	10

Synergy renewable assets

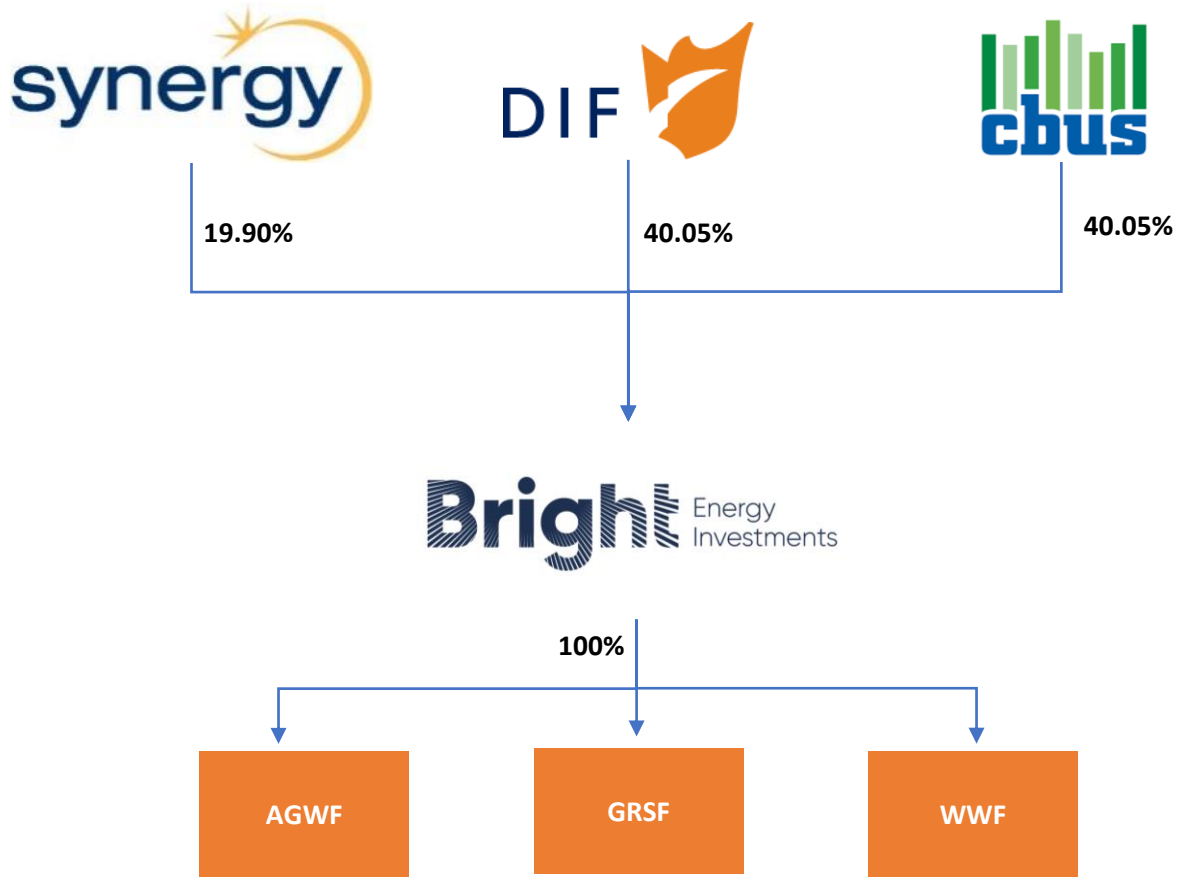


Bright Energy Investments

Background

- Bright Energy Investments (**BEI**) was established in April 2018
- BEI is a renewable energy investment vehicle established by Synergy, DIF and CBUS to acquire and develop large scale renewable energy generation assets in Western Australia
- Synergy holds a 19.9% equity interest in BEI, with DIF and CBUS each owning half of the remaining 80.1% interest
- BEI will own and develop a ~255MW portfolio of renewable energy assets

BEI Structure



Asset Overview

The BEI portfolio will consist of operating, development and construction assets

Bright Energy Investments

		Albany-Grasmere	Greenough River Solar Farm Stage 1	Greenough River Solar Farm Stage 2	Warradarge Wind Farm
					
Resource		Wind	Solar	Solar	Wind
Location		Albany	50km SE of Geraldton	50km SE of Geraldton	270km N of Perth
Project Status		Operational	Operational	Construction	Development
COD		2001 / 2011	2012	Expected 2019	Expected 2020
Capacity	MW	35	10	30	180
Turbine / Panel Supplier		ENERCON ENERGIE FÜR DIE WELT	First Solar.	First Solar.	TBD

synergy

Albany-Grasmere Wind Farm (AGWF)

The Albany and Grasmere wind farms have been in operation since 2001 and 2011 and have achieved an average capacity factor of 31.2% and 33.5% respectively

Overview

- 21.6MW Albany Wind Farm and the 13.8MW Grasmere Wind Farm which are co-located near Albany in Western Australia
- The 21.6MW Albany wind farm consists of twelve Enercon E-66 1.8MW machines and was completed in 2001
- The Grasmere wind farm is an extension of the Albany wind farm and consists of six Enercon E-70 2.3MW WTGs having a total capacity of 13.8 MW and completed in 2011
- The two wind farms include underground electrical cable reticulation systems, access tracks, crane hardstands and independent connections to the Albany substation

Asset location

Key project metrics

	Albany	Grasmere	Total
Number of turbines	12	6	18
Turbine type	Enercon E-66	Enercon E-70	n/a
Turbine hub height	65m	65 m	n/a
Installed capacity	21.6 MW	13.8 MW	35.4MW
Commercial operation date	2001	2011	n/a
Net capacity factor (P50)	31.2%	33.5%	n/a

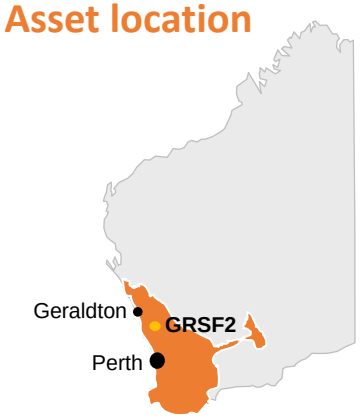
Greenough River Solar Farm (GRSF)

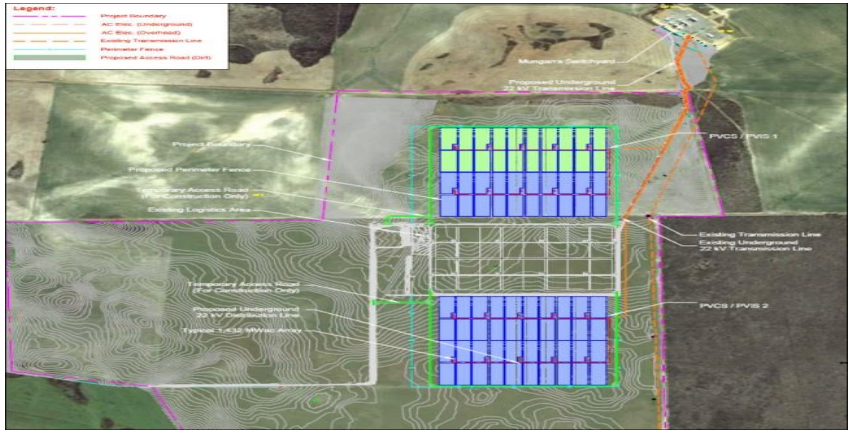
GRSF2 is a 30MW expansion of GRSF1 (10MW) and is currently under construction and expected to commence operations by 30 June 2019

Overview

- 40 MW (AC) in capacity
- Co-located to existing GRSF solar farm 10MW facility
- GRSF2 - single-axis tracking technology
- Integration, from a connection perspective, is via the existing 132/22kV transformer
- Site mobilisation has occurred; office set-up and fencing work commenced

Asset location





Key project metrics

Panel output	85 W	117.5 W
Number of panels	148,416	Approx. 330,000
Technology used	First Solar - Series 3	First Solar Series 4 Black
Installed capacity	10 MW AC	30 MW AC
Annual energy production (P50)	23.2 GWh	~84 GWh
Gross capacity factor	27.4%	~32%

Warradarge Wind Farm (WWF)

WWF is a high quality wind development asset with financial close targeted by late 2018 and COD by Q4 2020

Project background

- Located 270km north of Perth
- All planning approvals have been secured and are valid until 2022 - land leases are also secured
- Connection agreements are well advanced and expected to be finalised in December 2018
- 7 years of wind data, from three meteorological towers and two SODARs
- The project is being developed to 180MW

Asset location

Key project metrics

Location	Warradarge, Western Australia
Maximum tip height	Up to 152 metres
Number of turbines	Up to 51 turbines
Generation capacity	~180MW
Capacity factor	~48-50%
Connection	Western Power connection expected to be finalised December 2018
Land	Option and lease agreements have been signed with all landowners

synergy

New technologies new world

Community Battery

- Alkimos Beach Energy Storage Trial – launched first community battery in 2015 in conjunction with LendLease and ARENA

Virtual Power Plants

- VPP tech trials are in place across 10 x residential properties
- Mandurah Power Bank – working with Western Power

Electric Vehicles

- Continuing to support charging infrastructure and advocating for manufacturers to accelerate their entry

Bringing it together

Aligned with Government

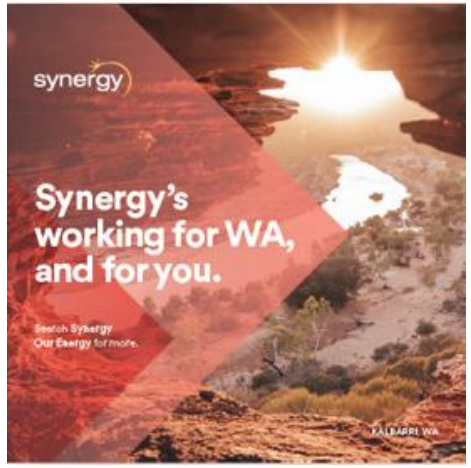
- Focus on strong renewable pipeline
- Developing regional Western Australia

A safe transition

- Affordable and reliable
- Integrating the future

Synergy's role is unique

- Government ownership
- Supply chain view
- The customer relationship



synergy


synergy
Thank you
10/9/2018