



Australian Wind Industry & GE Project Update

GE Renewable Energy
Wednesday, May 2nd

Today's Agenda

General Introduction

Australian Wind Industry

GE Projects

Technology Update



GE Renewable Energy

Onshore Wind



Offshore Wind



Hydro



LM Wind Power



\$10.3B

2017 REVENUE

60+

COUNTRIES

22,000+

GLOBAL
EMPLOYEES

400+GW

INSTALLED BASE

25%

OF WORLD'S HYDRO
INSTALLED BASE

35,000+

WIND TURBINES
INSTALLED GLOBALLY

14,000

TURBINES
ON PREDIX

Unleashing limitless energy for our customers and the world



© 2018 General Electric Company. Proprietary. All Rights Reserved.

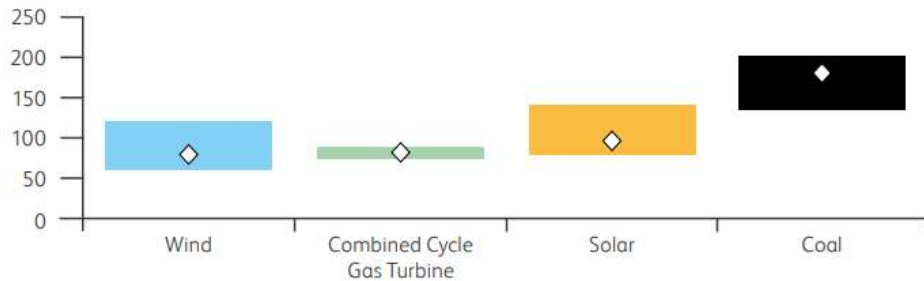


Renewables are Mainstream



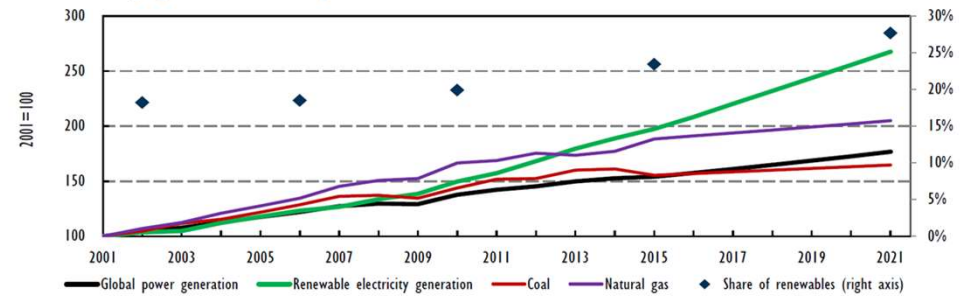
Technology driving LCoE reduction

2017 LEVELISED COST OF ENERGY FOR NEW BUILD TECHNOLOGIES IN AUSTRALIA (AUD/MWH)

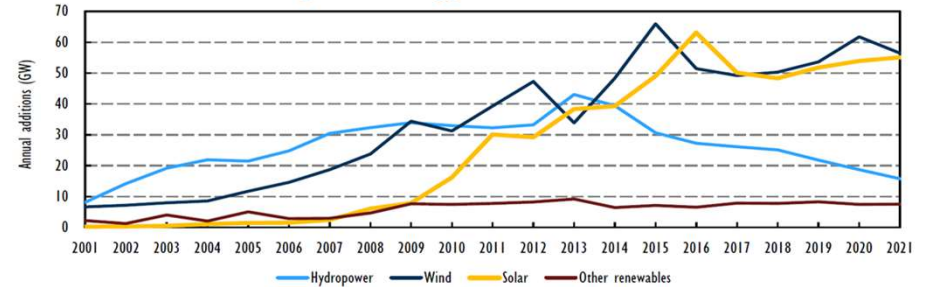


Source: Bloomberg New Energy Finance

Electricity generation by source



Renewable additions by technology



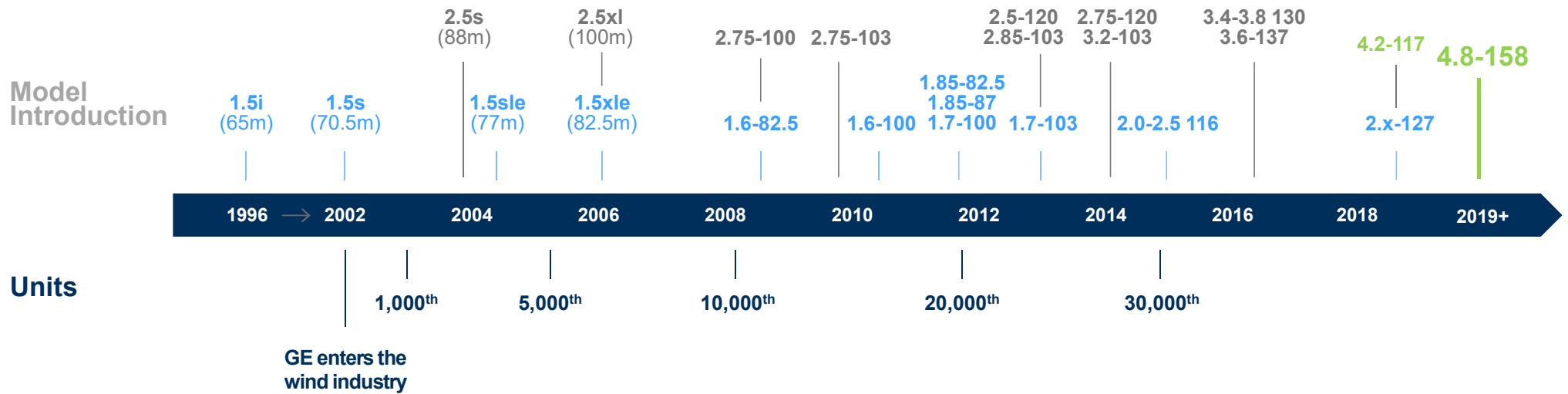
Confidential. Not to be copied, distributed, or reproduced without prior approval.
 © 2018 General Electric Company. Proprietary. All Rights Reserved.



Evolution of the GE wind portfolio



Addressing customer needs via a board portfolio





Next gen turbine ...

+70% rotor swept area in 4Y

Technology is essential to break the scaling laws ... driving lower LCOE

Challenge:

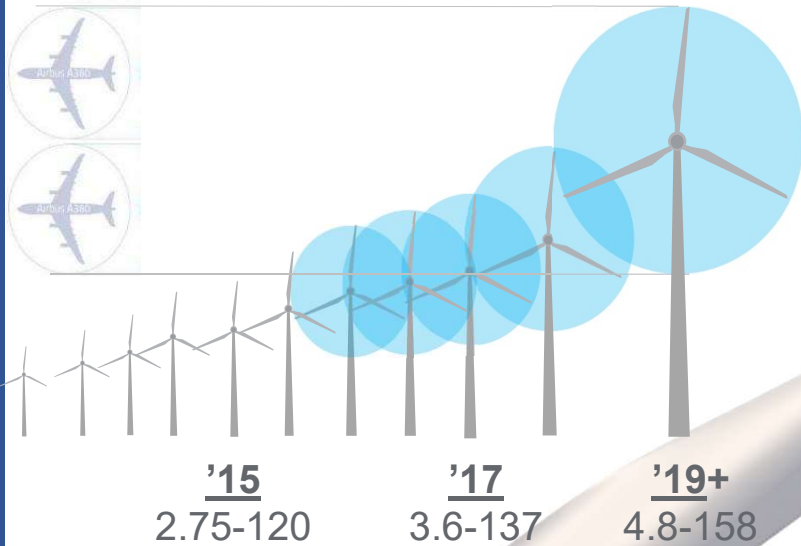
Turbines do not scale linearly

Energy \propto (Radius)²

Noise \propto (Radius X RPM)⁵ - (↑ torque, ↑ cost)

Loads \propto (Radius)³ - (↑ mass, ↑ cost)

Impacts logistics, installation, BOP, services & life cycle optimization





Australian Market Update

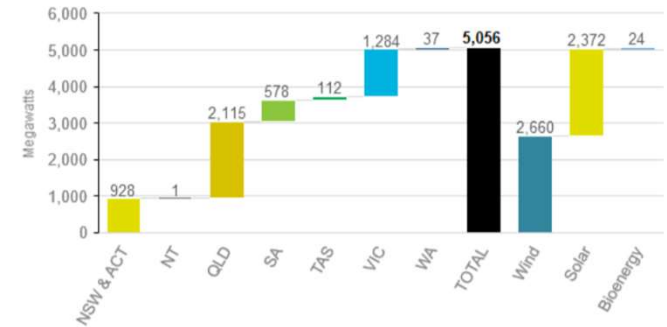


© 2017 General Electric Company. Proprietary. All Rights Reserved.

Australian Renewables

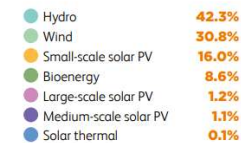
2017

- Mid 2015: bipartisan commitment to revised 33TWh RET (23% of Electricity)
- 2017 Closed or under construction
- 50 large-scale projects, AUD 9.3 Billion+ investment, 5440 jobs
- 2GW+ of wind
- 2GW+ of solar

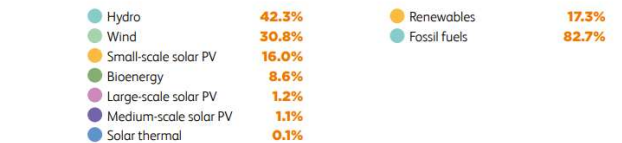
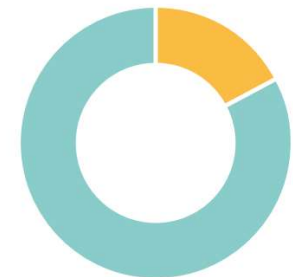


Graphic: Green Energy Markets, Renewable Energy Index February 2018

RENEWABLE GENERATION BY TECHNOLOGY TYPE



ANNUAL ELECTRICITY GENERATION IN 2016



Graphic: Clean Energy Council Annual Report 2016



Market Drivers

2018 onwards

- **Federal Policy**

- NEG – Coalition target 26% emissions reduction on 2005 levels
- Labour target 50% Renewables by 2030 – 17GW new build

- **State Policy: Renewable Auctions**

- Victoria – 40% Renewables by 2025 – 5.4GW new build
- Queensland – 50% Renewables by 2030 (currently 7%)

- **Coal Plant Closures**

- 20 active coal plants with nameplate of 25GW
- As of early 2017, 75% were operating beyond their original design life





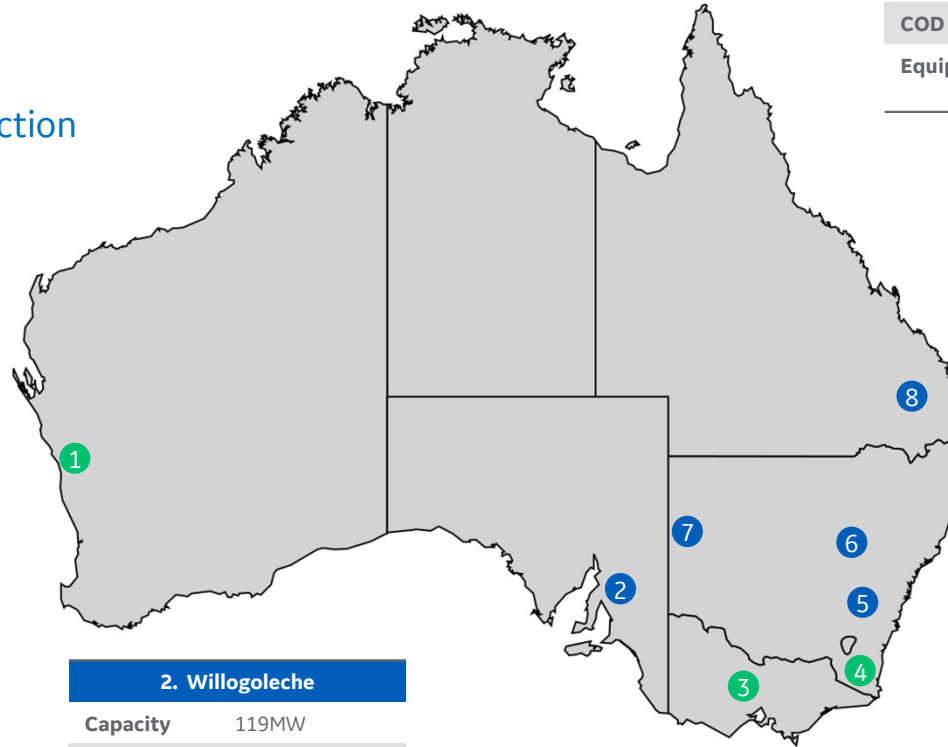
GE Projects



© 2017 General Electric Company. Proprietary. All Rights Reserved.

GE Wind Farms

- 416MW Operating
- 980MW In Construction



1. Mumbida	
Capacity	61MW
COD	2013
Equip.	22 x GE 2.75-100

2. Willogoleche	
Capacity	119MW
COD	2018
Equip.	24 x GE 3.8-130 8 x GE 3.4-130

3. Ararat	
Capacity	242MW
COD	2017
Equip.	75 x GE 3.2-103

4. Boco Rock	
Capacity	113MW
COD	2015
Equip.	67 x GE 1.7-100

8. Coopers Gap	
Capacity	453MW
COD	2019
Equip.	91 x GE 3.6-137 32 x 3.8-130

7. Silverton	
Capacity	199MW
COD	2018
Equip.	58 x GE 3.4-130

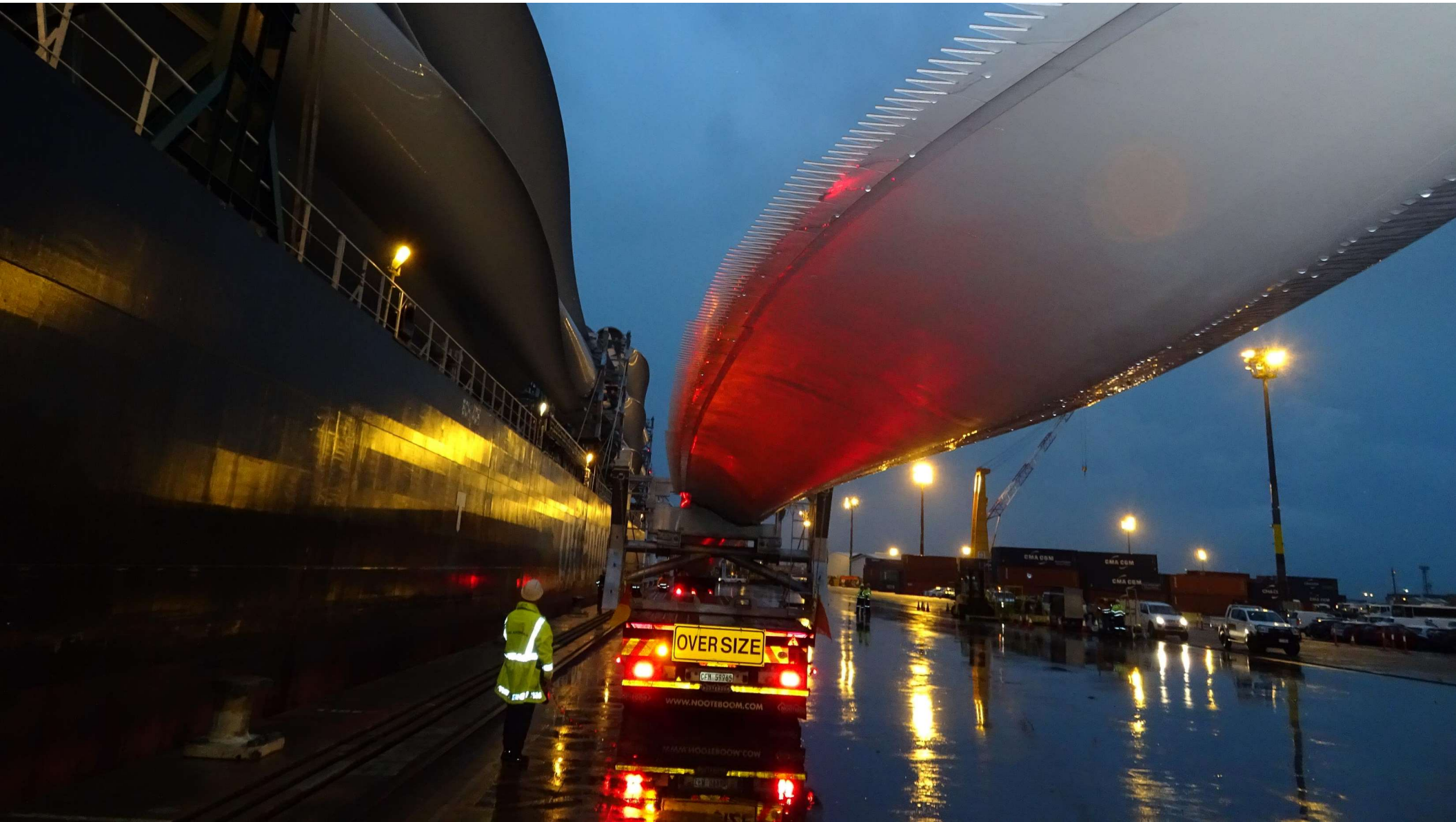
6. Bodangora	
Capacity	113MW
COD	2018
Equip.	33 x GE 3.4-130

5. Crookwell 2	
Capacity	96MW
COD	2018
Equip.	28 x GE 3.4-130



Silverton





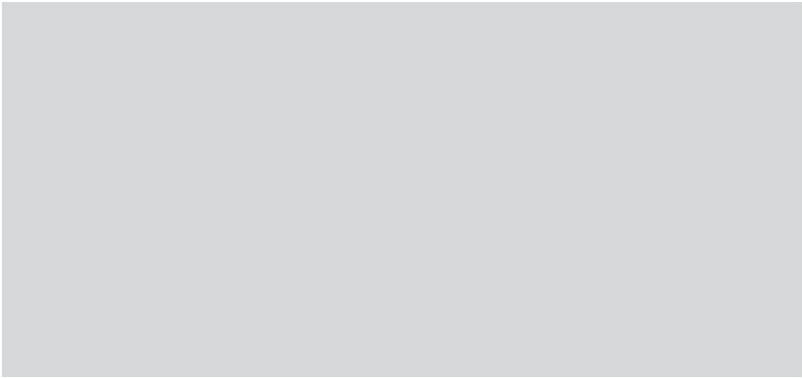


Confidential. Not to be copied, distributed, or reproduced without prior approval.









Confidential. No



Confidential. Not to be copied, distributed, or reproduced without prior approval.



Ararat



Confidential. Not to be copied, distributed, or reproduced without prior approval.





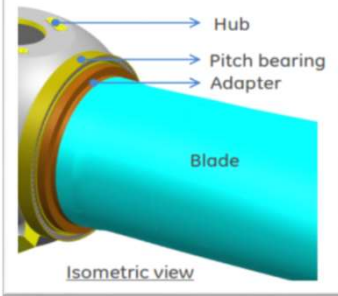
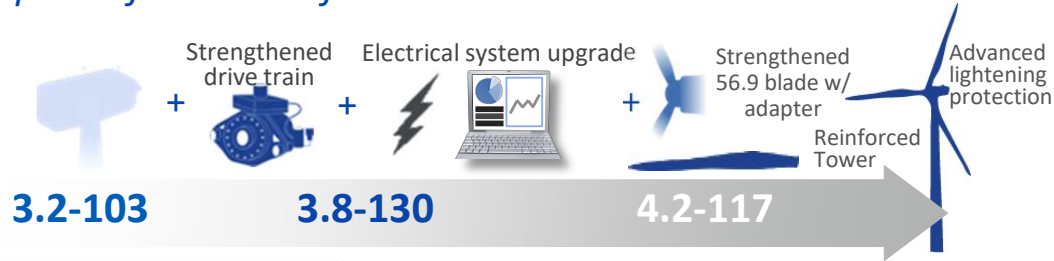
Technology Update



© 2017 General Electric Company. Proprietary. All Rights Reserved.

4.2-117

A powerful turbine for extreme environments



50 Hz	4.2-117
Specs	Max Vref 57m/s Vave 9.5m/s
MW rated power	4.23 MW (variable rating from 3.83 to 4.23)
Rotor Diameter	117m
AEP at 8.5m/s	~17GWh
Noise	107dBA
IEC Certificate (type Cert)	85/100m HH (IEC 61400-22)
Technology	<ul style="list-style-type: none"> • Low noise trailing edge • Lightning enhanced blade





4.8-158: POWER MEETS EFFICIENCY

GE's Largest, High Efficiency Onshore Turbine

Innovative Blade Design by LM Wind Power

Captures Low Wind Speeds Like Never Before



NOMINAL CAPACITY	<ul style="list-style-type: none"> • 4.8 MW
CAPACITY FACTOR	<ul style="list-style-type: none"> • 46%-49%
ANNUAL ENERGY PRODUCTION	<ul style="list-style-type: none"> • ~13.4GWh to ~21GWh
ROTOR DIAMETER	<ul style="list-style-type: none"> • 158 METERS
WIND CLASS	<ul style="list-style-type: none"> • IEC (S)
TIP HEIGHTS	<ul style="list-style-type: none"> • 180m, 199,9m, 228m, 240m
TOWER HEIGHTS	<ul style="list-style-type: none"> • 101m, 120,9m, 149m, 161m
LIFETIME	<ul style="list-style-type: none"> • ~25 years





GE Renewable Energy

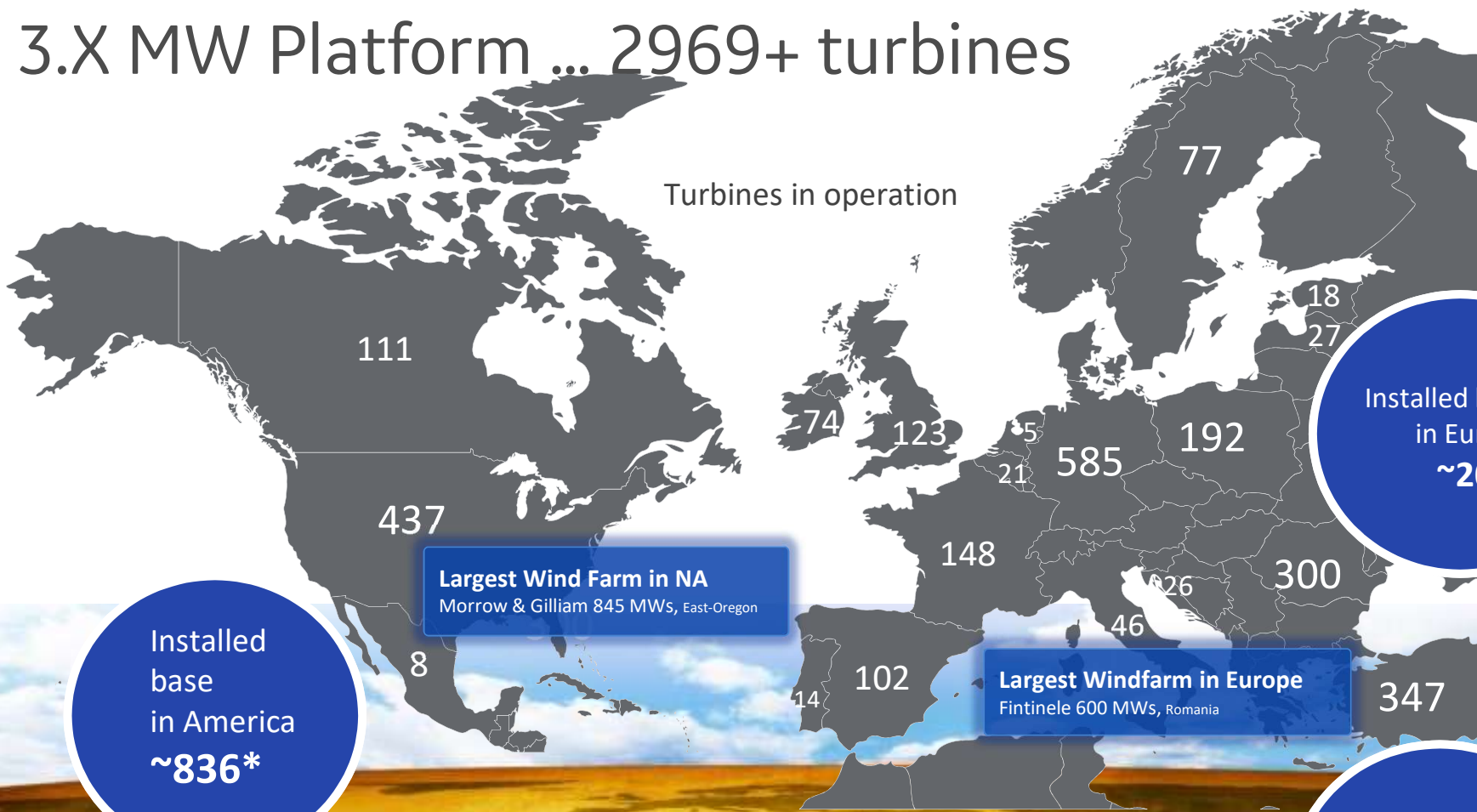


David Lian
Head of Sales - Onshore Wind ANZ
GE Renewable Energy
david.lian@ge.com



3.X MW Platform ... 2969+ turbines

Turbines in operation



Installed base in America
~836*

Largest Wind Farm in NA
Morrow & Gilliam 845 MWs, East-Oregon

Installed base in Europe
~2036

Largest Windfarm in Europe
Fintinele 600 MWs, Romania

Installed base in APAC
~97

Including ~380 Units from former Alstom ECO 3MW platform



