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Presentation

Handout

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How large is the Australian **Wind** **Turbine Market?**

Installed WTG's within Australia – A Service Market

Cranes in Wind

Australia's renewable energy sector has seen rapid growth, with wind power playing a crucial role in meeting sustainability targets.

Cranes play a pivotal role throughout the wind energy lifecycle, from the initial construction of wind farms to the ongoing operations and maintenance of wind turbine generators (WTGs).

During the construction phase, heavy-duty cranes are indispensable for precisely lifting and positioning massive components such as towers, nacelles, and blades. This ensures that each turbine is assembled safely and accurately, even in challenging and often remote environments.

In contrast, during the operations and maintenance phase, cranes are utilised for more targeted interventions - such as replacing bearings or upgrading critical components - thereby minimising downtime and extending the lifespan of the turbines.

In both stages, the reliability and versatility of cranes are essential for maintaining the structural integrity and efficiency of wind energy projects.

The unique challenges posed by wind farms necessitate careful planning, specialised equipment, and adherence to stringent safety standards.

This presentation evaluates the volume of works and the impact of what is evolving into a significant and growing crane market.

An Overview of WTG Type in Australia

Wind turbine generators in Australia can be broadly categorised into two main types: Horizontal Axis Wind Turbines (HAWTs) and Vertical Axis Wind Turbines (VAWTs).

HAWTs

HAWTs are the more traditional and widely used type in Australia. They typically have three blades that spin on a horizontal axis. These turbines form the basis of this overview, and are commonly found on wind energy projects across the country.

Wind energy is playing an increasingly important role in Australia's renewable energy mix, accounting for 33.2% of renewable energy generation and 13.2% of total electricity production.

[Data Source](#)

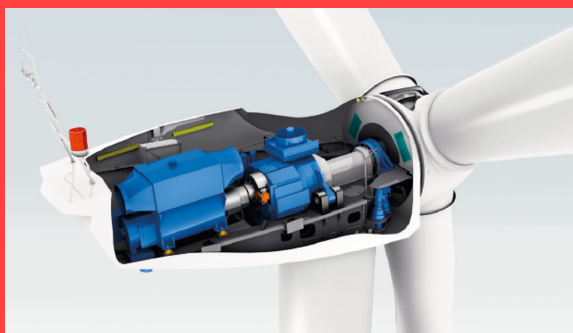


Image Source: Servion



Image Source: Goldwind

Direct Drive vs Drive-Train

Direct drive and drive-train are two different approaches to converting wind energy into electrical power in wind turbine generators. Here are the key differences between them:

Direct Drive

- No gearbox: Direct drive turbines eliminate the need for a gearbox, connecting the rotor directly to the generator.
- Low-speed operation: These generators can produce electricity while spinning at the same low speed as the wind turbine blades, typically 5-15 rotations per minute.
- Fewer moving parts: The simpler design results in less maintenance and potentially higher reliability.
- Generator type: Often uses permanent magnet synchronous generators with a "doughnut" configuration.
- Weight and size: Direct drive generators tend to be larger and heavier, especially for high-power turbines.



Image Source: Goldwind

Drive-train (with Gearbox)

- Includes gearbox: The drive-train system uses a gearbox to increase the rotational speed from the rotor to the generator.
- Speed conversion: Gearboxes typically increase the rotation speed by about 100 times, from 8-16 RPM to 1,000-1,800 RPM.
- More complex: The system has more moving parts, including the gearbox, which is often the highest-maintenance component.
- Generator type: Usually uses high-speed induction generators.
- Weight distribution: The weight is distributed between the gearbox and a smaller generator, potentially making individual components easier to transport and install.

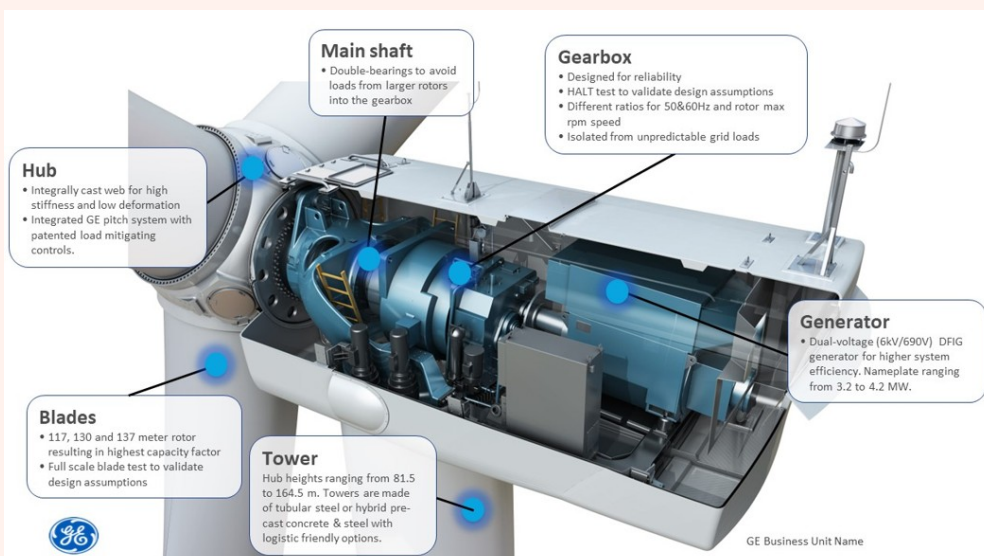


Image Source: GE

Requirements for Cranes in WTG O&M (Operations and Maintenance)

These requirements ensure that cranes can effectively handle the challenges of wind turbine operations and maintenance;

Lifting Capacity

- Cranes must have sufficient lifting capacity to handle heavy wind turbine components.

Height and Reach

- Cranes need to reach significant heights to access turbine components.

Stability and Ground Pressure

- Cranes must be stable on various terrains and exert minimal ground pressure.

Mobility and Assembly

- Quick assembly and disassembly are crucial for efficient operations.

Adaptability

- Cranes should be adaptable to different wind turbine models, sizes and hub heights.

Wind Resistance

- Cranes must be able to operate in varying weather (wind) conditions.

Transportation

- Ease of transportation is essential for moving between turbine sites.

Precision

- Cranes need to offer precise positioning of loads.

Installation and Maintenance Capabilities

- The ultimate crane will be adaptable between installation / construction and maintenance; a growing shift now becoming visible within the Australia wind market.



Vergent Wind Turbines installed at Coral Bay, Western Australia – offering a design that does not require a crane for maintenance (excluded from these statistics).

Installed WTG's within Australia – A Service Market

Review of WTG Quantities, Heights and OEM's within Australia

Does not include:-

- Ross Island Wind Farm in Antarctica.
- Victoria's first WTG, formally operational in Breamlea just outside of Geelong.
- Comprehensive numbers on the early Enercon units (Operational Units are included where available).
- Conclusive on all private wind generation sites, such as some of those present in the WA market.

Includes construction works recently completed, or soon to be such as:

- Clarke Creek Wind Farm, QLD
- Goyder Wind Farm, SA

Excludes current construction works newly commenced or planned, such as:

- Wambo Wind Farm – Stage 1
- Golden Plains Wind Farm – Stage 2
- All future farms whereby construction has not commenced (in terms of WTG works)

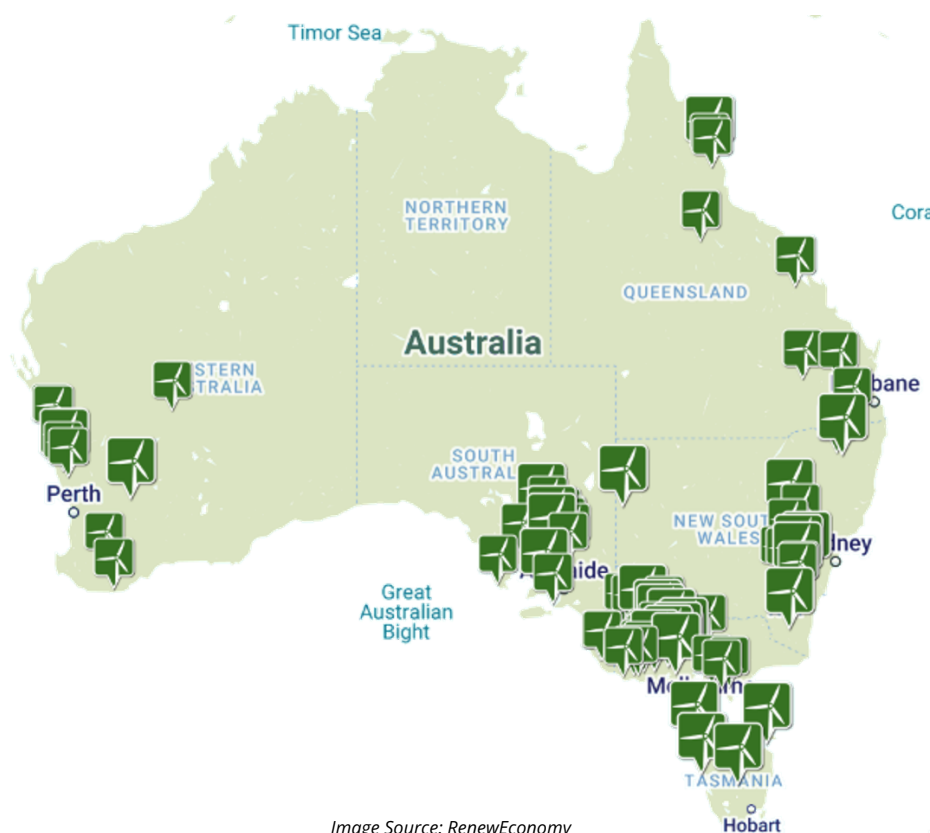


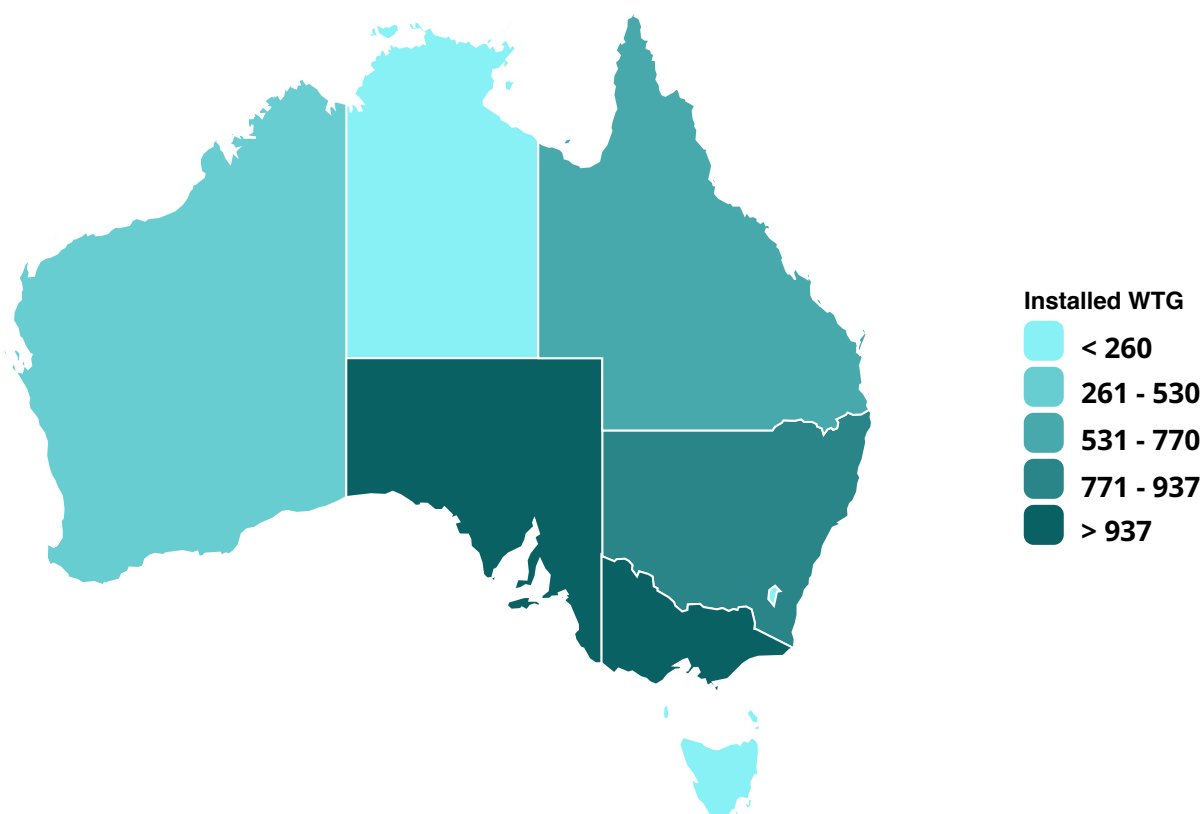
Image Source: RenewEconomy

“The Australia wind turbine operation and maintenance market size was valued at USD 603.03 million (\approx AUD 949.13 million) in 2024. The market is projected to grow from USD 652.00 million (\approx AUD 1,026.29 million) in 2025 to USD 906.28 million (AUD 1,426.54 million) by 2032, exhibiting a CAGR of 4.82% during the forecast period.

Fortune Business Insights

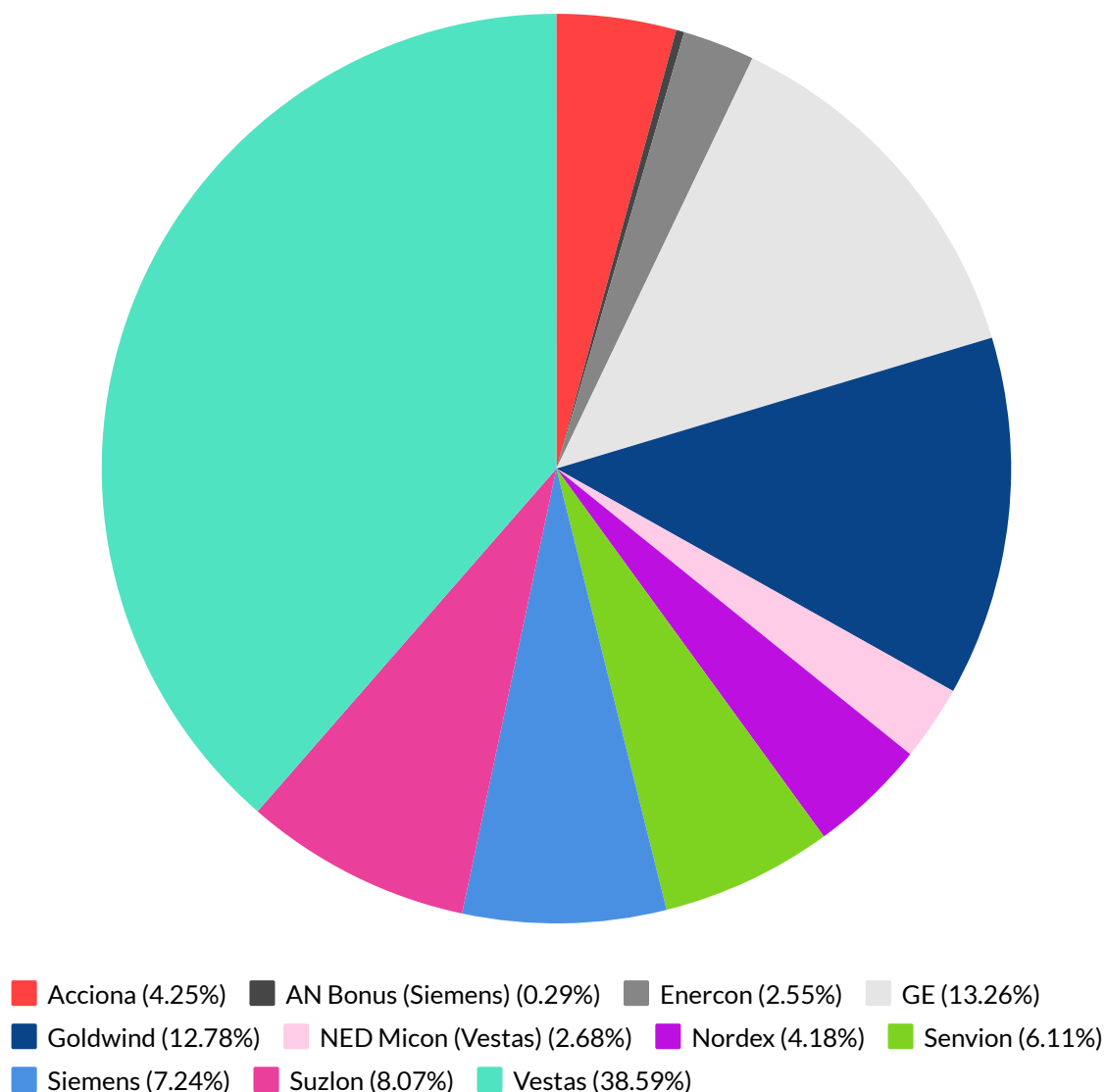
Installed WTG's within Australia – A Service Market

Overall (Installed) WTG Quantity within Australia



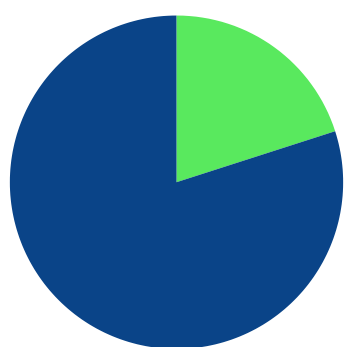
Installed WTG's within Australia – A Service Market

Installed WTG / Original WTG OEM

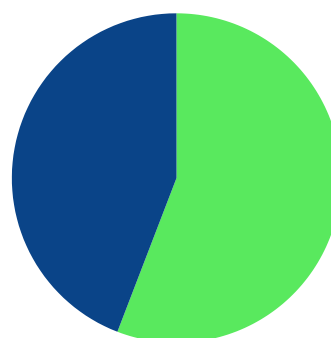


NB: Reflective of WTG OEM (Original Equipment Manufacturer), not O&M (Operation and Maintenance) Operator of a given WTG.

Installed WTG's within Australia – Generator Type



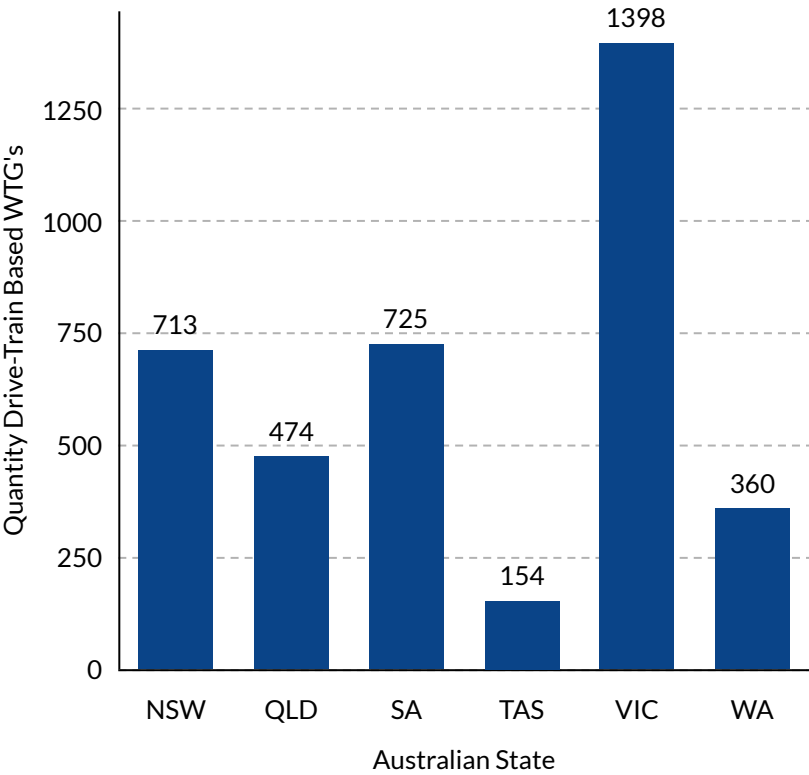
Direct Drive (20.05%)
Drive-Train (79.95%)



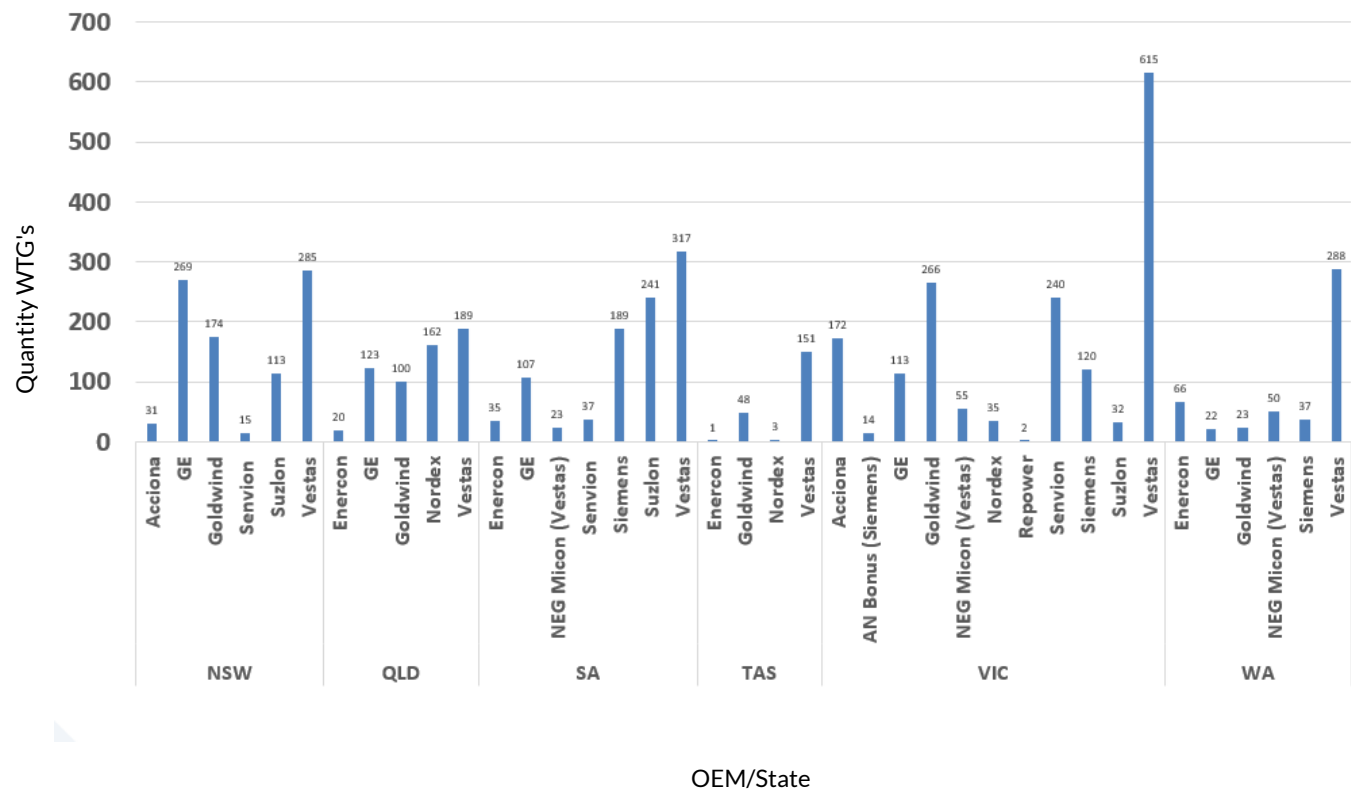
Rotor Lift (55.84%)
Single Blade Lift (44.16%)

Installed WTG's within Australia – A Service Market

Drive-Train based WTG / State

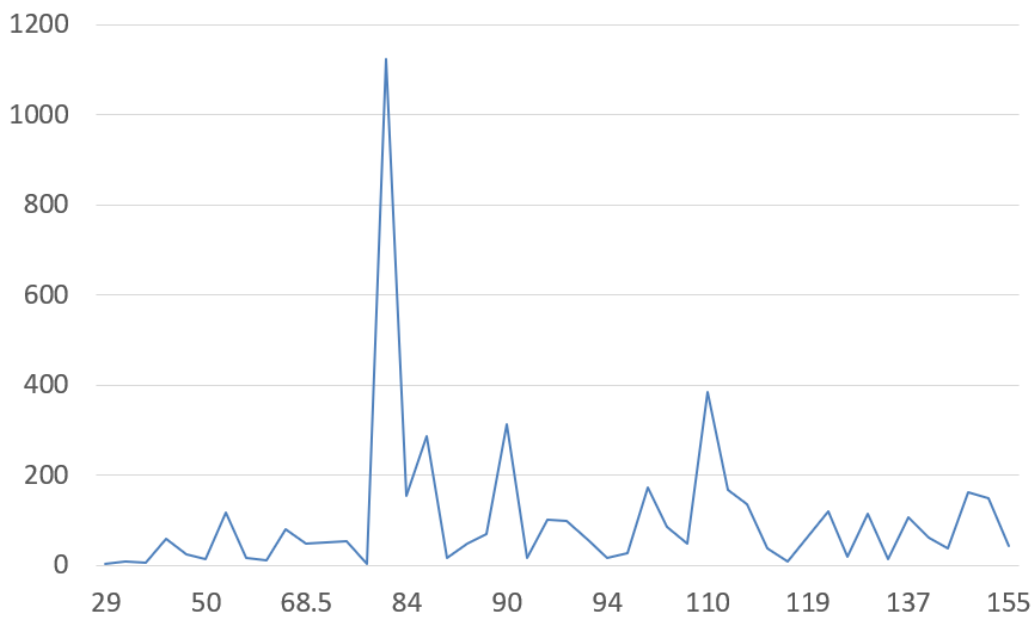


Installed WTG / WTG OEM / State

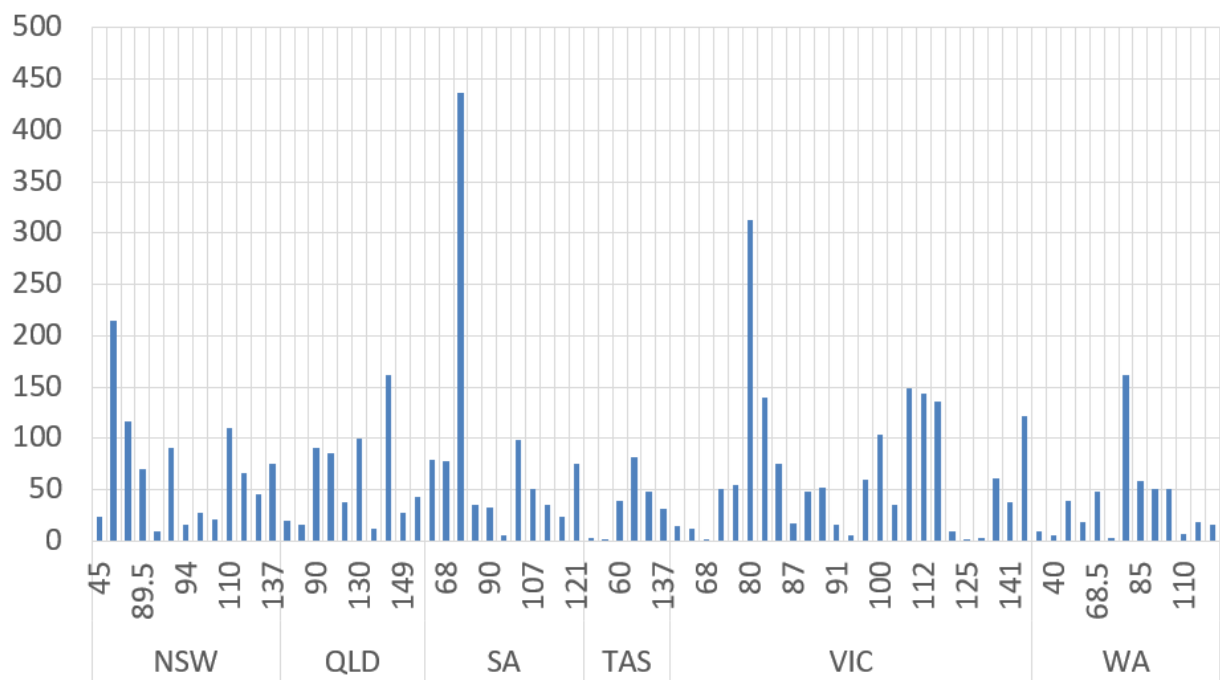


Installed WTG's within Australia – A Service Market

Qty at installed Hub Height / Overall

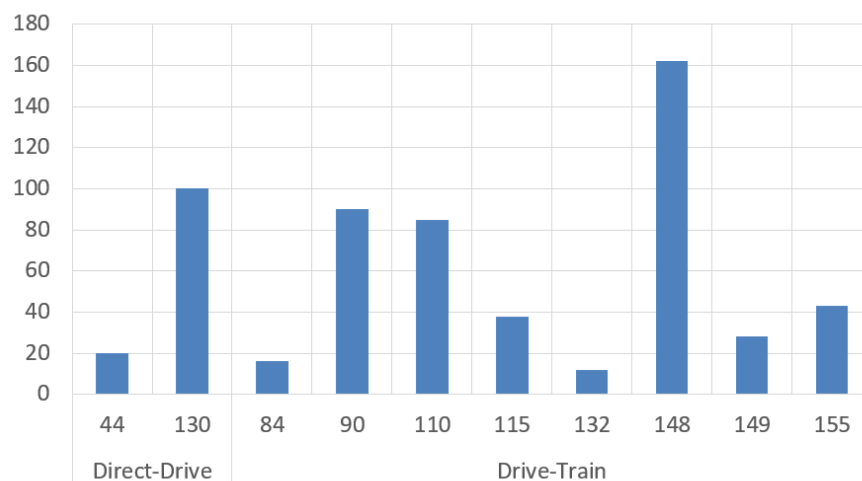


Qty at installed Hub Height / State

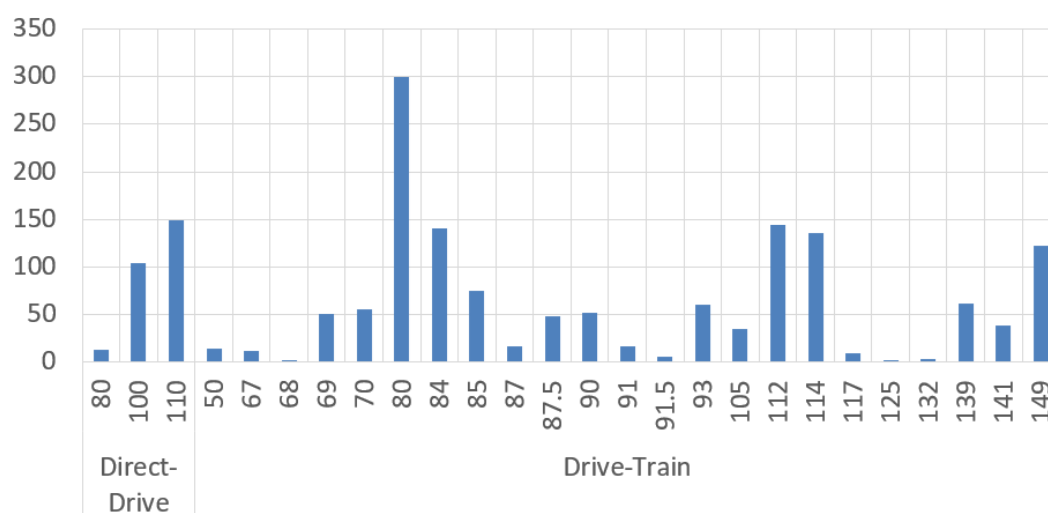


Installed WTG's within Australia – A Service Market

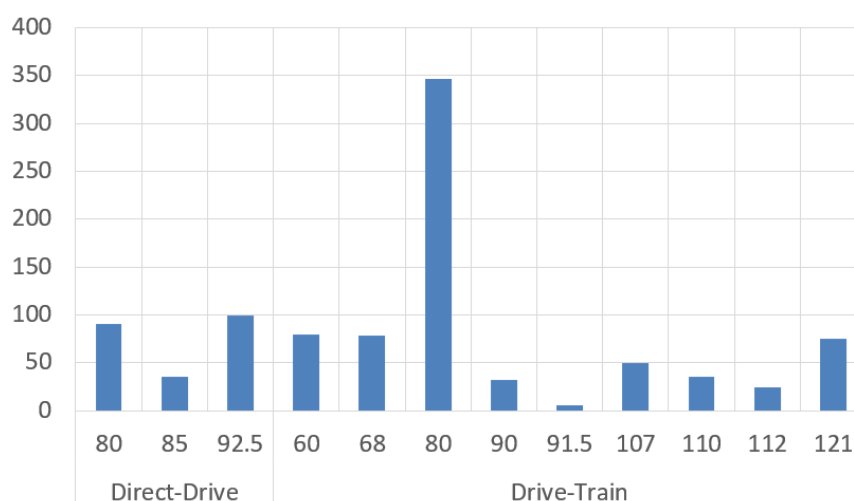
Example... Queensland (by Hub Height)



Example... Victoria (by Hub Height)



Example... South Australia (by Hub Height)



Conclusion

As technology advances and government support for renewable energy grows, wind turbine technology in Australia is expected to continue developing and expanding.

This evolution is not only paving the way for increased efficiency and innovation within the wind energy sector but is also creating significant opportunities for the crane industry.

Specialised cranes are increasingly essential in both the building and maintenance of wind turbines, ensuring safe, efficient, and precise installation as well as timely upkeep.

As Australia reinforces its commitment to a sustainable energy transition, the intersection between advanced turbine technology and crane capabilities will be instrumental in shaping a robust renewable energy future.



**One voice for the
Australian **crane**
industry**

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