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Engineering a greener future

UoS briefing – 23rd June ‘21

The uncomfortable truth

- The wind industry is a green energy source but ….
- Linear thinking and practices remain deeply ingrained
- The opportunity to embed greater sustainability within the supply chain has major business benefits
- But this requires a culture change within big business

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The Renewable Parts philosophy

- Renewables Parts was formed in 2011 with the single idea of increasing re-use of wind turbine parts to reduce waste
- Since that time business growth has focused on adding customer value through increasing turbine availability and reducing cost of operation
- Investment in circular economy technology has been a rising priority with our innovation partner, the University of Strathclyde
- The delivery of high quality refurbishment solutions has dramatically increased during the past three years – the industry is now at a tipping point
- RPL will continue to extoll collaborative, working with businesses who share a passion for sustainability

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Inspiring green innovation

- **Mindset** – a relentless pursuit of improvement, a hunger to learn and seek better, greener ways of doing things

- **Realism** – an awareness that the process will involve “misfires”, every egg can’t be a bird, but it’s all learning

- **Investment** – a willingness to invest the time and money, commitment to long term goals, results will take time

- **Partners** – clustering expertise, finding the right partners and sharing knowledge, most successful innovation requires close collaboration

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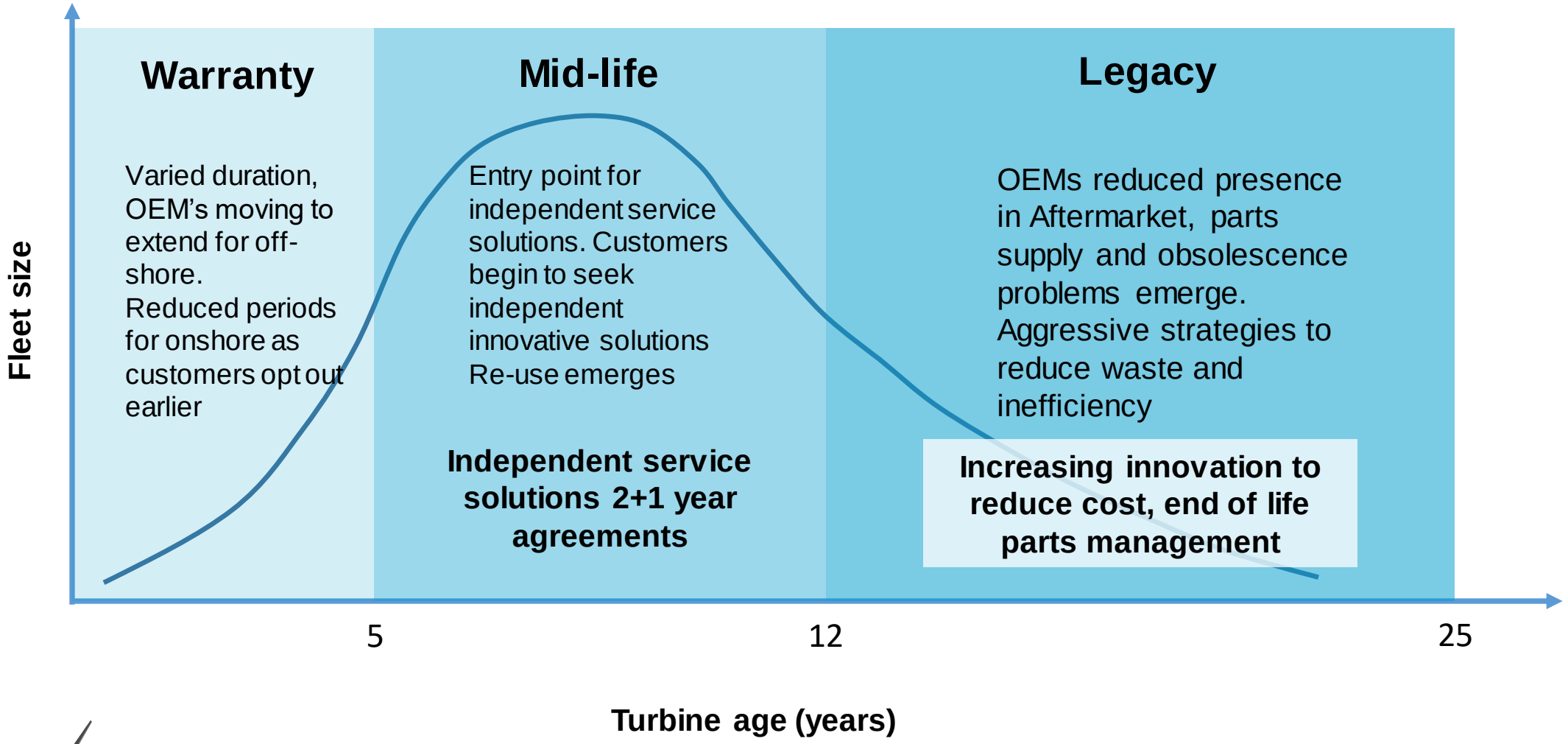
Wind turbine lifecycle



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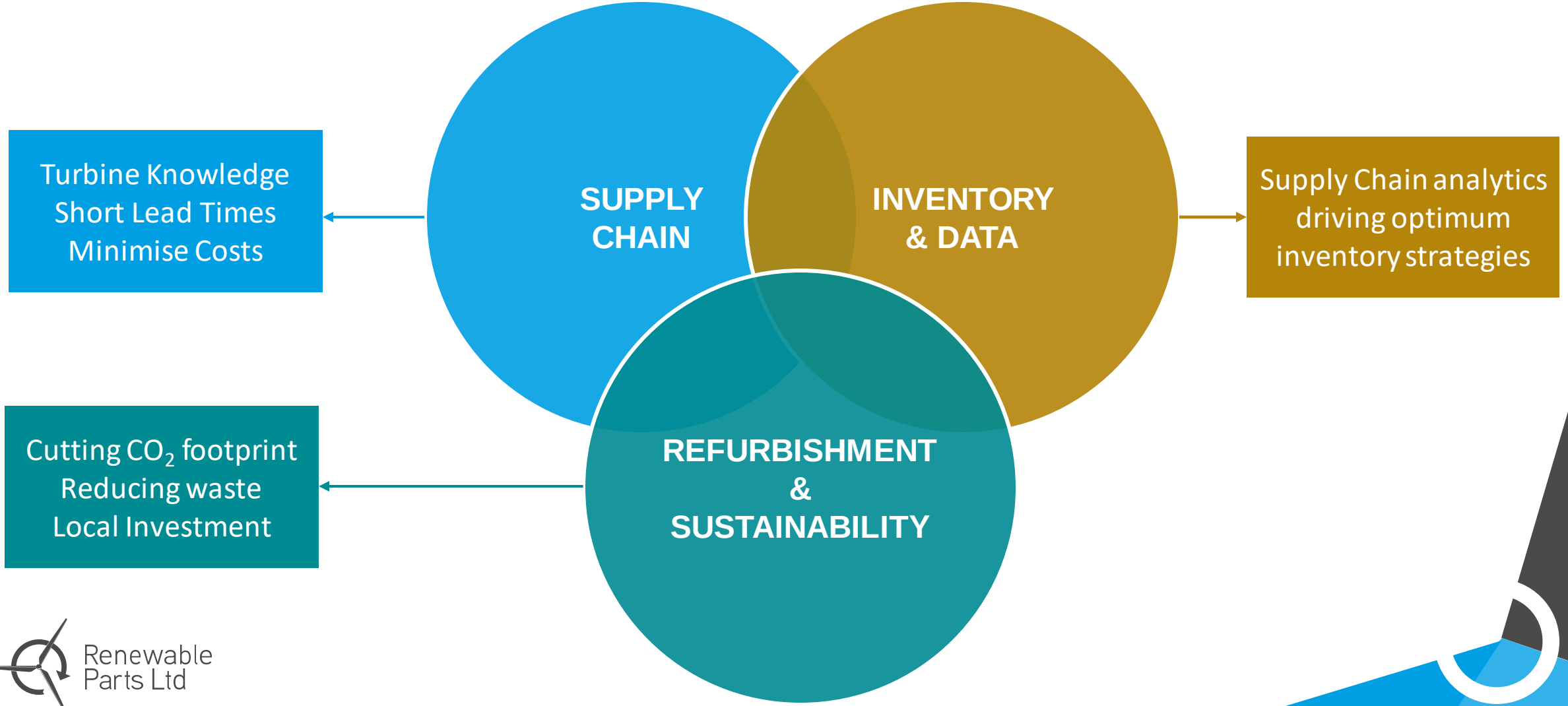
Business model priorities



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Changing cultures

- Procurement practices today typically follow a fit once and dispose philosophy, parts re-use is limited
- Businesses continue to focus on price and lead-time but rarely ask for sustainable solutions
- Indications that change is occurring, but it requires a culture shift driven from stakeholders, investors, and boardrooms
- But changing a culture is notoriously difficult although there's always a tipping point
- We must change the risk averse *"No one got fired for buying IBM"* mindset to embed new, improved re-use practices

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Developing sustainable parts solutions

- The opportunity for circular economy in the Aftermarket supply chain is significant, BOMs for a typical turbine are ~8,000 parts

- To date refurbishment solutions have been largely restricted to high value, main components

- Understanding the risk to value correlation is essential to developing the right solutions

- We apply a rigorous evaluation and development process:
    1. Identify areas of highest cost / operational disruption
    2. Perform definitive RCA on component failure mechanisms
    3. Design high performance solutions using latest process and material technology
    4. Conduct rigorous destructive testing

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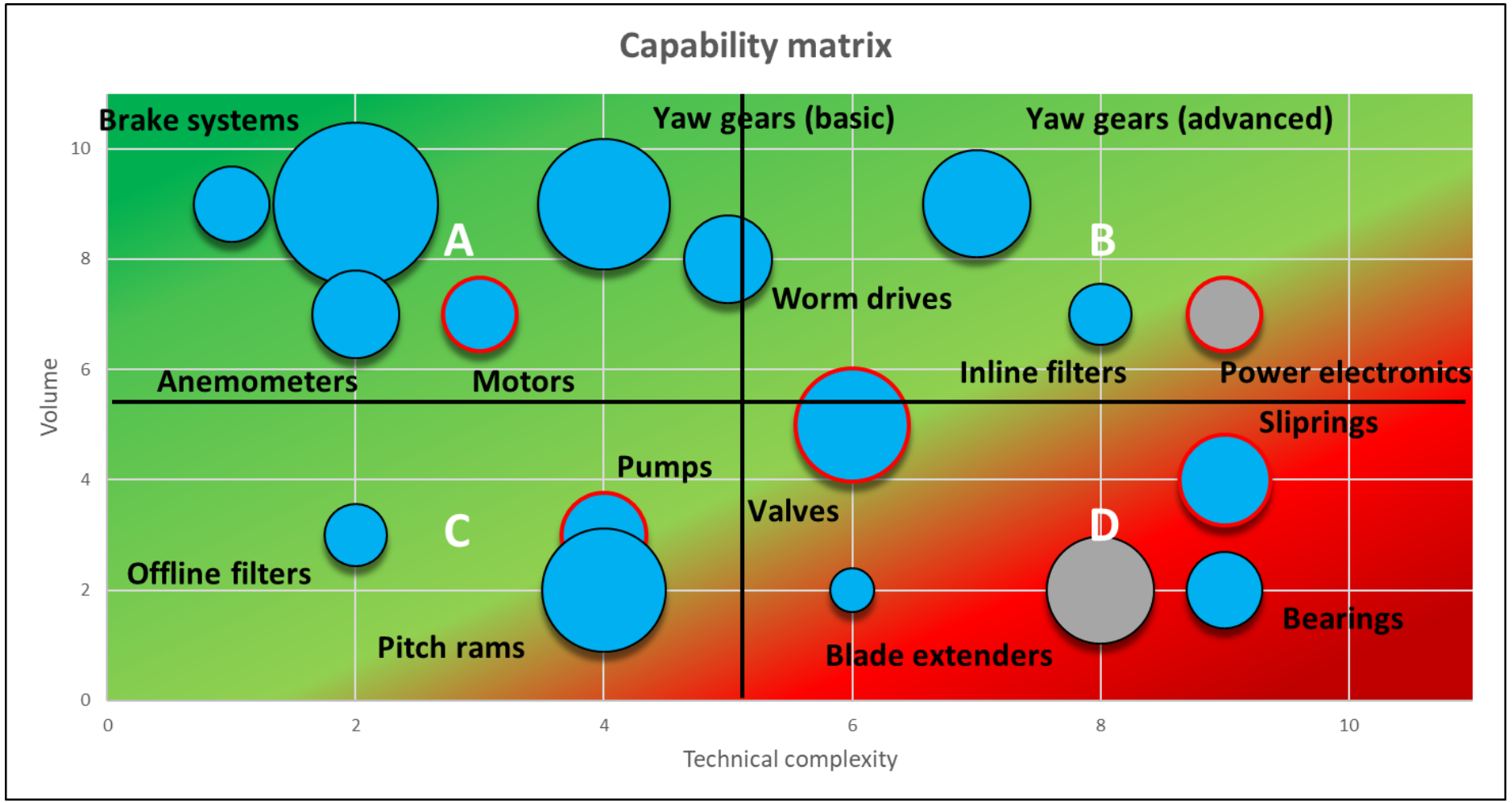
Technical assessment – refurbishment



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Reducing our carbon footprint

Assumptions:
1000 miles trip to OEM
9 mile/ gallon
2.62kg CO_2 / litre

10kg CO_2 / yaw gear transit
400kg CO_2 to fabricate new

- For illustration we take a Siemens 2.3MW yaw system:
  - Turbine has 8 yaw gears with an average life of 5-7 years
  - Each yaw gear weights ~180kg and costs ~£3,000 new
- Yaw gear refurbishment is seldom utilised despite offering cost and environmental benefits

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Carbon equivalent to a flying a 747 for 4.5 hours

Delivering compelling results

136,000
ITEMS MOVE THROUGH OUR SUPPLY CHAIN ANNUALLY

70t
OF SCRAP DIVERTED AWAY FROM WASTE AND LANDFILL

130t
CARBON FOOTPRINT REDUCTION SINCE 2019

2000
WIND TURBINES ARE CURRENTLY SUPPORTED ACROSS OUR CHAIN

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