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Global HVDC Subsea Cable Supply Challenges

Introduction

A global boom in offshore wind development has created significant supply chain constraints in the high-voltage direct current (HVDC) cable market. This has serious implications for major proposed Australian energy projects including SunCable, Marinus Link, and the emerging offshore wind industry. Finding a solution is urgent, as highlighted by the recent announcement of SunCable's proposed advanced cable manufacturing facility, earmarked for Bell Bay in Tasmania's north.

Growing global demand

Over the past 2-3 years there has been a significant shift in the HVDC cable market. Offshore wind developments are now implementing HVDC export systems with capacities of 750MW to 2,000MW. These export systems utilise 320-525kV HVDC offshore substations, onshore converter stations and HVDC subsea cables.

Figure 1 outlines the projected total offshore wind installed in GW until 2050. The coming decade sees offshore wind growing significantly. The developments are also moving further offshore, increasing the demand for total length of cable.

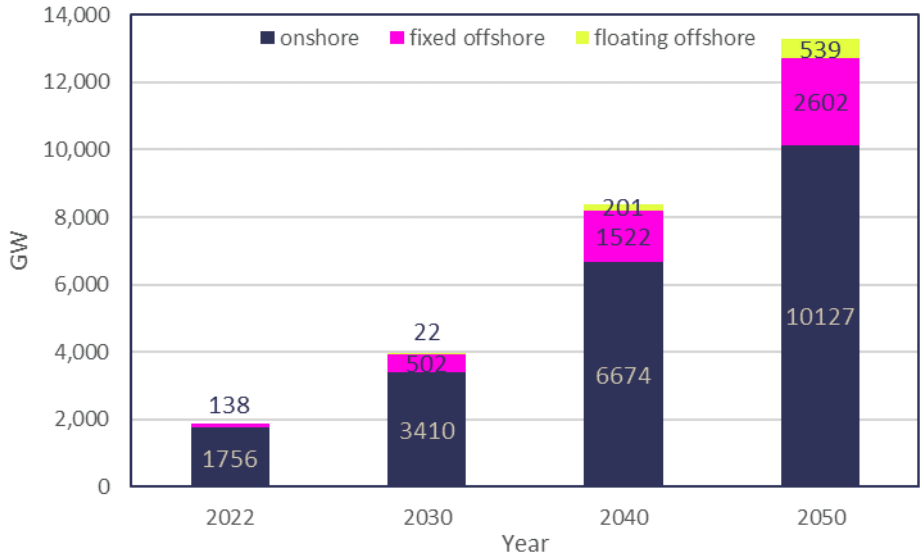

Figure 1- Total installed and projected wind capacity in GW (DNV ETO 2022)

Looking at offshore wind in more detail, Figure 2 outlines the installed capacity each year until 2032. Based on nominal industry figures for export cables, there is a demand for about 120km of cable per GW of installed capacity.

The current global capacity to supply HVDC subsea cables is in the order of 3,000-5,000km per year. Based on this, global demand outstrips supply around 2027.

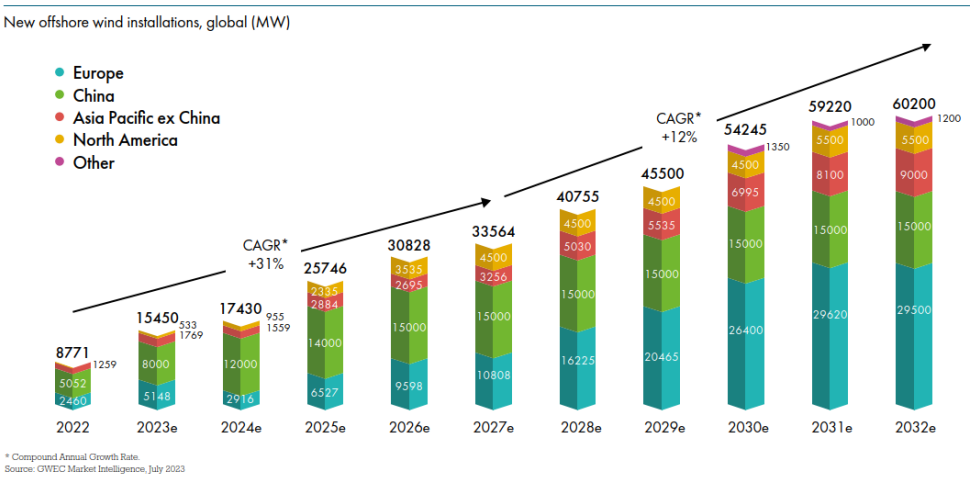

Figure 2- Offshore wind projected installations per year in GW (GWEC 2023 report)

In anticipation of major supply squeezes in the late 2020s, developers have begun pre-purchasing production slots with cable manufacturers to guarantee supply. **This poses a significant challenge for new entrants to the market and risks blowing out project development and construction timelines.**

Case Study - TenneT secures 10% of global cable supply

TenneT is a Transmission System Operator (TSO) based in the Netherlands and Germany. In recent months TenneT has awarded three bidders (NKT; Nexans; and a consortium consisting of Jan De Nul, LS Cable and Denys) individual contracts for 10 offshore cable systems. These contracts amount to 2,000km of HVDC subsea cable at a cost of €5.5 billion. In parallel, TenneT ordered three 2GW HVDC offshore substations, to be delivered in line with the subsea cables.

These cables are due for delivery between 2026 and 2031, equating to approximately 10% of the total supply capacity until 2031.

These were fast-track tenders, completed in six months. Through this expedited process Tennet secured frame agreements with the cable suppliers, guaranteeing supply as global demand soars.

Guaranteeing supply for Australian energy projects

The supply chain constraints outlined above have serious implications for SunCable, Marinus Link and offshore wind developments in Australia.

It means projects that are not proactively identifying (and securing) cable manufacturing slots in the next 6-12 months risk missing a pre-2030 construction window.

SunCable's proposed $2bn manufacturing plant is a bold move to build the southern hemisphere's first HVDC subsea cable production facility. It has the potential to shore up cable supply for SunCable's 4,300km subsea link between the Northern Territory and Singapore, as well as future energy projects across the APAC region.

The company's preferred site at Bell Bay, Tasmania has several advantages:

- **Power:** Tasmania has 100% renewable energy and an ambition to grow this to 200% by 2040. This makes a local manufacturing facility ideal to deliver "green" cables.
- **Infrastructure:** Bell Bay has a deep water port and abundance of available sites for a large-scale cable manufacturing facility. It is an established industrial area, minimising the impact on amenity.
- **Geography:** Port access directly to Bass Strait to enable easy export to developments throughout Australia and Asia.
- **Future markets:** Offshore wind zones currently being declared across Australia will require subsea cables from the late 2020s and throughout the 2030s. Asia is tipped to see the world's largest offshore wind market growth through the 2030s. Securing HVDC cable supply is essential for these industries to develop at speed and scale. There is a guaranteed market for a Tasmanian advanced cable manufacturing facility for decades to come.

Let's go!

CoreMarine has been actively working to address HVDC cable supply issues with Australian stakeholders and welcomes SunCable's proposed local cable facility. It is essential to avoid new energy developments across APAC being caught up in the global cable supply backlog, and an unmissable opportunity for Tasmanian industry.

If you want to know more about the design, manufacture, offshore installation and optimal operation of subsea cables, reach out!