

Lamprell renewables production line



THE PRODUCTION LINE

In 2022, Lamprell invested in a state-of-the-art automated production line that is being used for the serial fabrication of offshore wind substructures. The production line, which was commissioned in 2023, has the ability to construct transition pieces, monopiles and floating wind components for renewables projects.

With exponential growth in the offshore wind sector expected to continue for the foreseeable future, this strategic investment in automated high-capacity can rolling, welding, milling, and non-destructive testing significantly expands our foundation production capacity.

Lamprell's production line, which is located in our Hamriyah facility in Sharjah, UAE, consists of five segments called 'pads', with various stations in each that include machines, equipment, storage and worker bases. The set-up is similar to that of a factory, though outdoors and widely shaded, that builds a product by passing an item from one station to the next until the product is complete.





LAMPRELL PRODUCTION LINE PADS

THE PRODUCTION LINE PADS

PAD 1

Consists of a material receiving area used for steel plate unloading, inspection and storage. It also boasts stations for plate cutting, grinding, plate splicing and welding. The output from pad 1 consists of up to four steel pieces welded together, creating a single maximum plate length of 33 metres. These are used to produce cans in pad 2.



PAD 2

Includes a steel plate receiving area, can rolling machines, as well as stations for fit-up, inside welding, milling, outside welding, re-rolling and flange fit-ups. The output here includes cans with a maximum diameter of 10.5 metres. Welds are then generally NDT inspected prior to movement of the cans to pad 3.



PAD 3

Pad 3 is the heart of the production line, where single cans are joined together by cutting-edge rotators, milling machines, as well as inside and outside PEMA developed welding stations which are known for having a high efficiency rate. All stations are driven on rollers. An automated NDT inspection process occurs prior to moving onto the next pad for outfitting works.



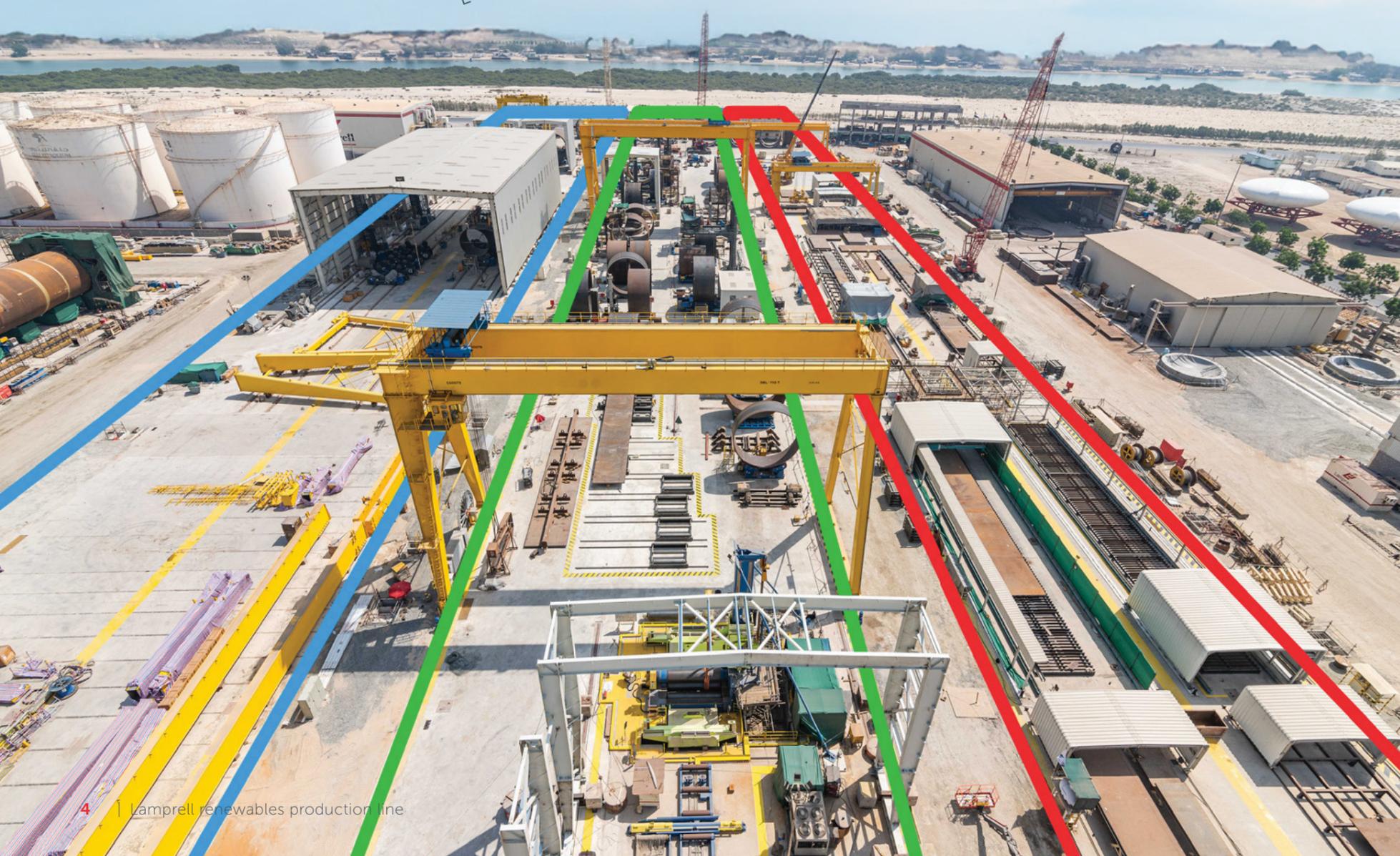
PAD 4

Consists of multiple outfitting stations, also on driven rollers, which are used for internal and external weld attachments of secondary structures. Post coating assembly completion works and commissioning also occur in this pad.



PAD 5

Consists of washing, grit-blasting and coating stations on driven rollers. Stations in this segment are temperature and humidity controlled, allowing for 24/7 operation and the best surface protection results.



THE PRODUCTION LINE STATIONS

Our production line has over 40 stations for material receiving, CNC plate preparation, joining, long seam milling, rolling, flange fit-up and welding, can-to-can fit-up and welding, seam milling and welding and finally, black steel outfitting.

All stations are on heavy-duty rollers, essential components of the production line, enabling efficient material handling and accurate

positioning. Cranes, straddle carriers or SPMTs are used for the transportation of the heavy steel product from one station to the next.

Each process step, which is a specific stage within the production line, also boasts an NDT station to ensure a flawless and perfect product.

Our blasting and painting sheds complete the finish of the primary

steel. These sheds are used to prepare the metal surface for coating and the application of paint for corrosion protection, visibility and aesthetics.

Once the painting is complete, the finished tubular structure is transported to the completion station where secondary steel such as boat-landings as well as external and internal platforms are joined to

the structure. Each transition piece then undergoes electro-mechanical installations and final commissioning before being moved to storage, ready for transportation.

SOME OF THE KEY STATIONS THAT MAKE UP LAMPRELL'S PRODUCTION LINE



STEEL PLATE DELIVERY AND UNLOADING



LONG SEAM CNC PLATE CUTTING, BEVELING AND CHAMFERING



LONG SEAM WELDING



ROLLING MACHINE PLATE FEEDING



CAN ROLLING IN PROGRESS



FLANGE FIT-UP AND WELDING



OUTFITTING OF TRANSITION PIECES



APPLICATION OF MULTIPLE LAYER COATING



OUTFITTING STATION WITH WELD ATTACHMENTS



CIRCULAR SEAM WELDING



CIRCULAR SEAM MILLING



CAN ASSEMBLY STATION

PRODUCTION LINE CAPABILITIES

With the investment in the production line, Lamprell can produce a variety of **tubular products up to 10.5 meters in diameter, 30+ meters in length and up to 500 tonnes, with a material thickness of approximately 150 millimetres.** This means we can meet the demands of large-scale projects and provide comprehensive solutions.

The production line is being used predominantly to deliver products to the renewables industry, and we are focused on the serial fabrication of monopiles and transition pieces.

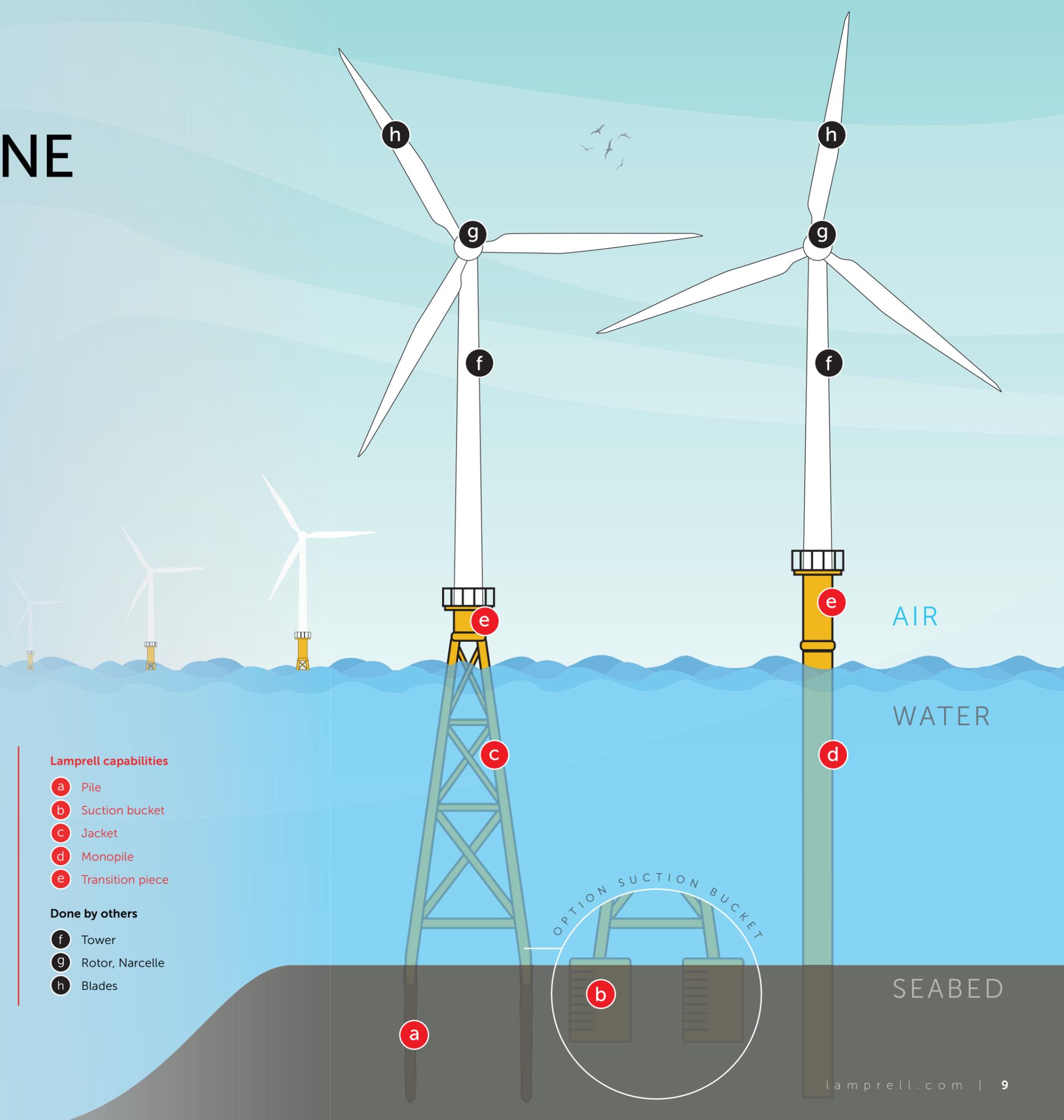
Monopiles

A monopile is one of three popular offshore wind foundation structures used in the renewables industry; it acts as a support structure for wind turbines. A monopile consists of a hollow steel tube ranging from approximately 8 metres in diameter. The length varies between 50 to around 120 metres, and the structure's weight ranges from 500 to 2,500 tonnes each. Monopiles can be driven between 20 and 60 metres below the ocean floor, depending on factors like water depth, seabed conditions and the overall design and length of the wind turbine foundation. Monopile designs are produced by expert engineering companies, who consider all of the above as well the turbine tower details and turbine generated power

output. A monopile sits mainly below the water's surface, underneath the wind turbine tower, typically through a transition piece. These massive cylindrical foundations are designed to support and stabilise the turbine tower, enabling the efficient harnessing of wind energy for electricity generation.

Transition pieces

A wind turbine transition piece is a structural component that sits in between the top tower, which carries the nacelle and tower blades and the foundation structure of an offshore wind turbine, connecting the two. It helps support the weight of the turbine and ensures proper alignment during installation. Transition pieces provide a stable platform for housing essential electrical and mechanical equipment and comprise steel elements, including boat landings, ladders, access points and platforms, bound together by a thick-walled tubular-shaped structure constructed from rolled plates. The structural elements that make up a transition piece present unique features and are critical components of wind turbines, contributing to the structural soundness and reliability. Transition pieces allow for the safe access and operation of wind turbines, ensuring maintenance activities can be carried out. Made from steel, transition pieces can withstand harsh marine environments, enabling efficient energy generation from offshore winds while facilitating ease of installation and upkeep.



Lamprell capabilities

- a** Pile
- b** Suction bucket
- c** Jacket
- d** Monopile
- e** Transition piece

Done by others

- f** Tower
- g** Rotor, Nacelle
- h** Blades

PRODUCTION LINE BENEFITS

The benefits of this new investment are numerous. We will experience improved material handling and welding efficiency, which will lead to increasing tonnage throughput within our facility. These enhancements will ensure repeatable quality performance across high-volume production.

- ☑ **SPEED** - the speed at which a production line operates compared to manual speed is incomparable
- ☑ **ACCURACY** - measurements to cut, fit-up, mill or weld steel and perform other tasks are far more accurate
- ☑ **LESS WASTAGE** – accuracy when cutting or milling steel means less wastage and increased productivity compared with manual execution

- ☑ **IMPROVED SAFETY PERFORMANCE** – the less human interaction involved in certain tasks, the fewer safety incidents, which is in line with Lamprell's outstanding safety performance
- ☑ **SIMULTANEOUS PROCESSES** – the production line can have the various cutting, milling and rolling machines working at the same time, ensuring there is no break in production
- ☑ **REDUNDANCY** – stations are redundant to ensure ongoing output even during equipment maintenance
- ☑ **COMPETITIVE ADVANTAGE** – we are the only yard in the Middle East to have this cutting-edge technology available, with a very limited number of international competitors.
- ☑ **UNIFORMITY** - the technology used on the production line allows for uniformity





Lamprell renewables production line

For more information about
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