Helping the UK achieve **NET ZERO** Targets

wave beam

The Elevator Pitch

Wavebeam Modular Floating Floor or Extension will allow operators to temporarily or permanently utilise existing laydown areas and provide additional space for Decommissioning, Plug and Abandonment, Marginal Fields, Well Intervention campaigns and TAR applications

Using a Wavebeam Extension instead of a Supply boat or PSV

equates to a saving of 233 tonnes of carbon per month

Helping the UK achieve **NET ZERO** Targets

wave beam

Adding a Wavebeam Modular Extension will increase the laydown area on existing offshore assets

Make use of the free overhanging deck space

at a fraction of the cost of other available

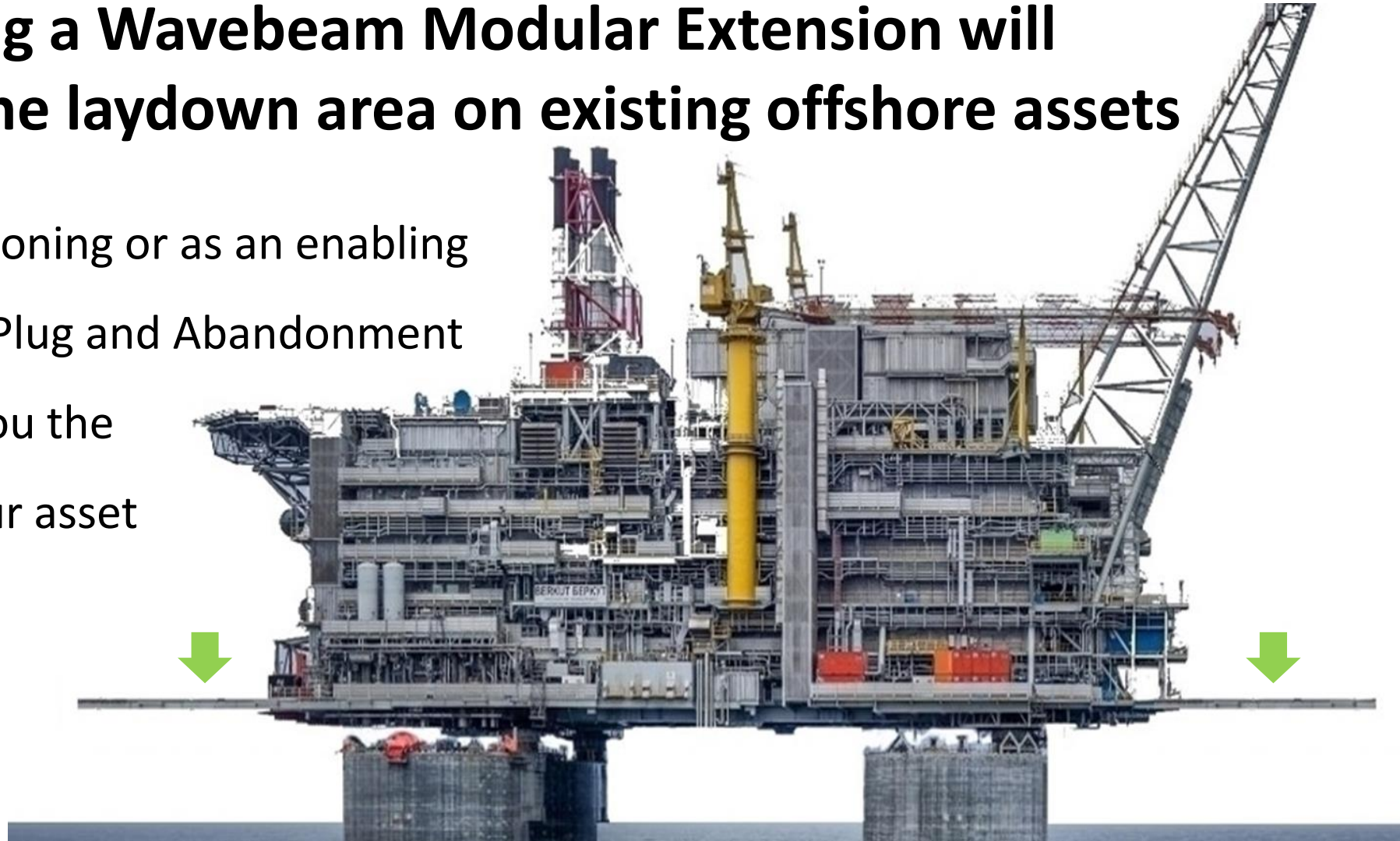
floating alternatives

Helping the UK achieve **NET ZERO** Targets

wave beam

Adding a Wavebeam Modular Extension will increase the laydown area on existing offshore assets

During Decommissioning or as an enabling technology during Plug and Abandonment Wavebeam gives you the ability to utilise your asset to the maximum.



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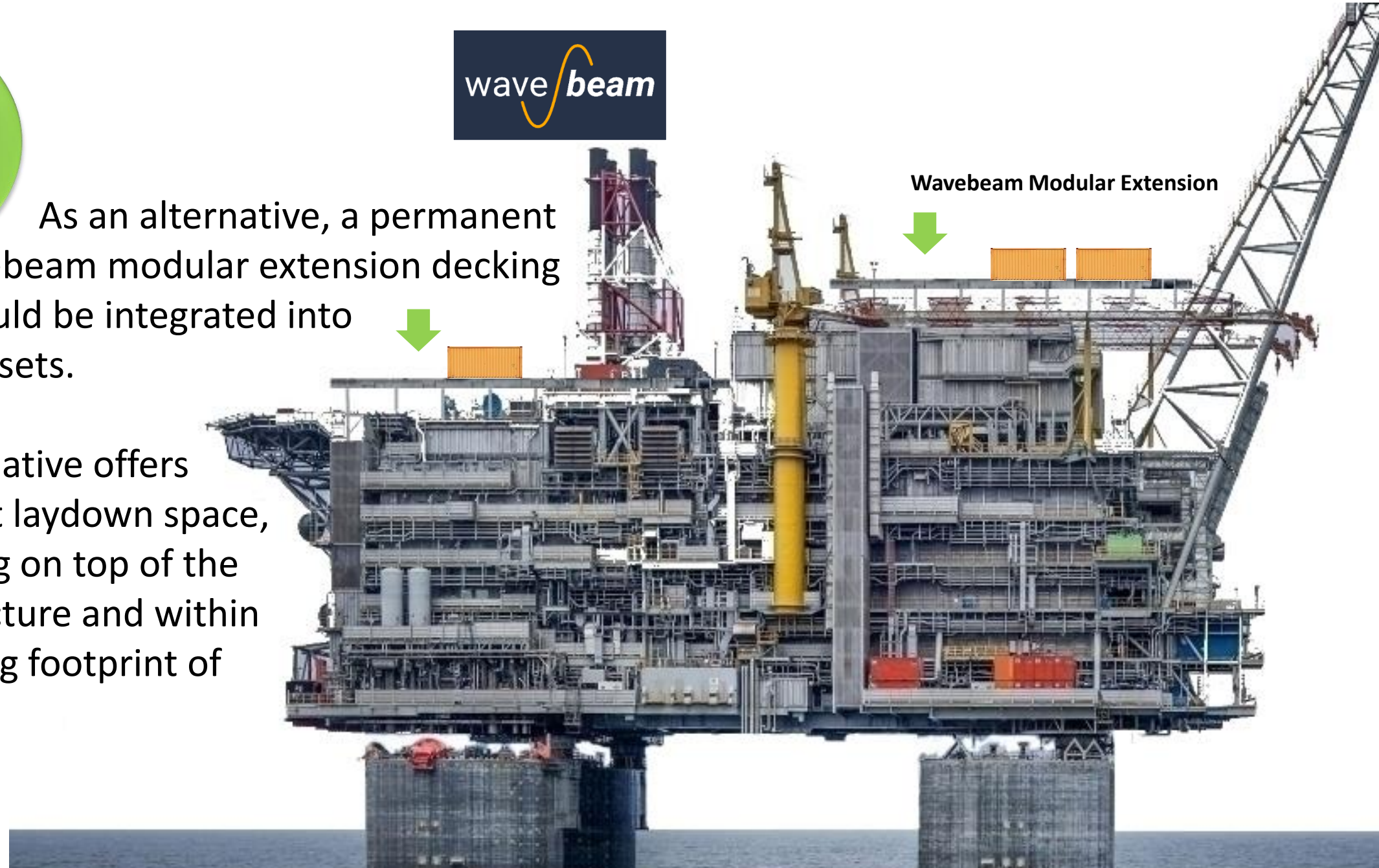
As an alternative, a permanent Wavebeam modular extension decking system could be integrated into existing assets.

This alternative offers the largest laydown space, by stacking on top of the main structure and within the existing footprint of the asset



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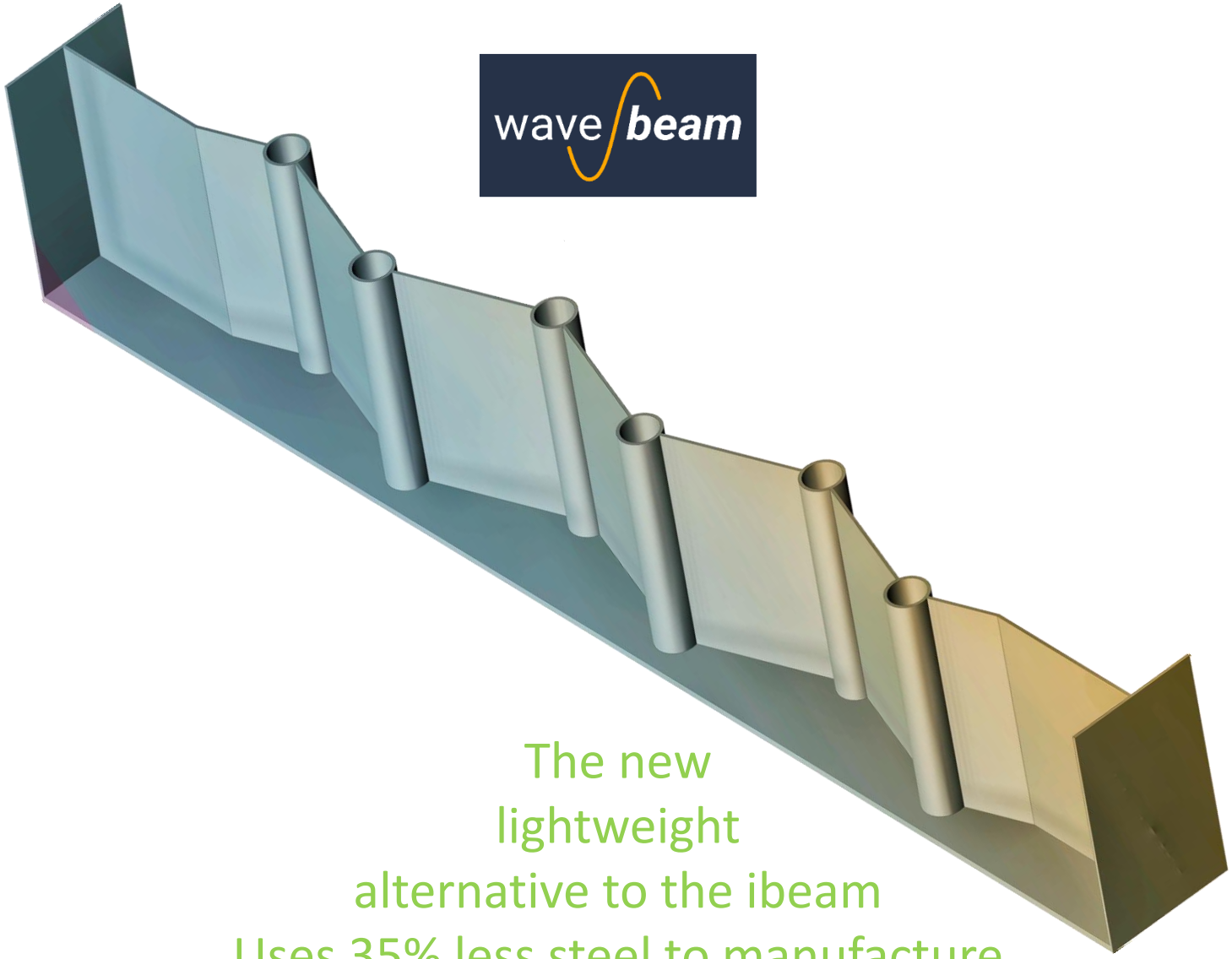
wave beam

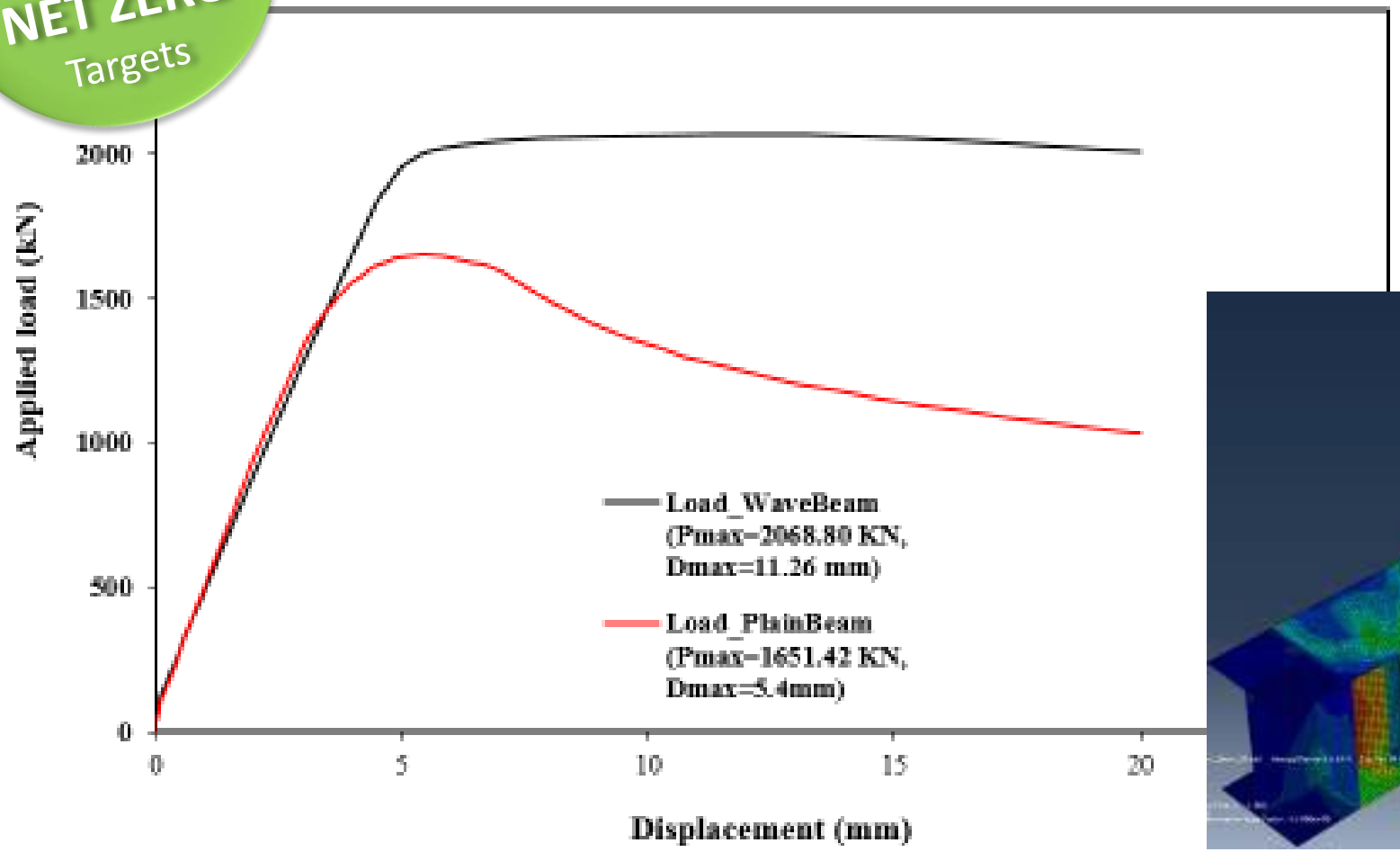


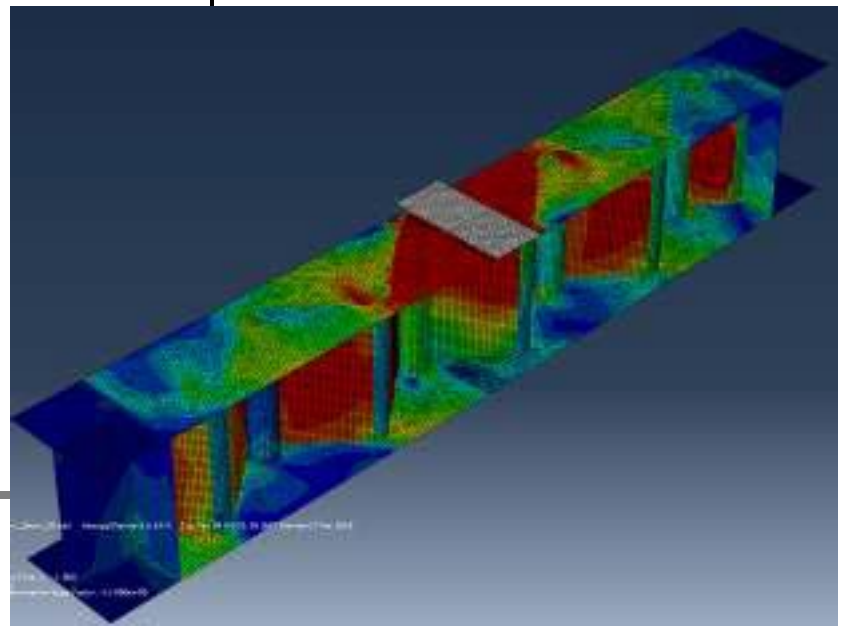
The new
lightweight
alternative to the ibeam
Uses 35% less steel to manufacture

Helping the UK achieve **NET ZERO** Targets

Web buckling

Sample analyses of University of Strathclyde results





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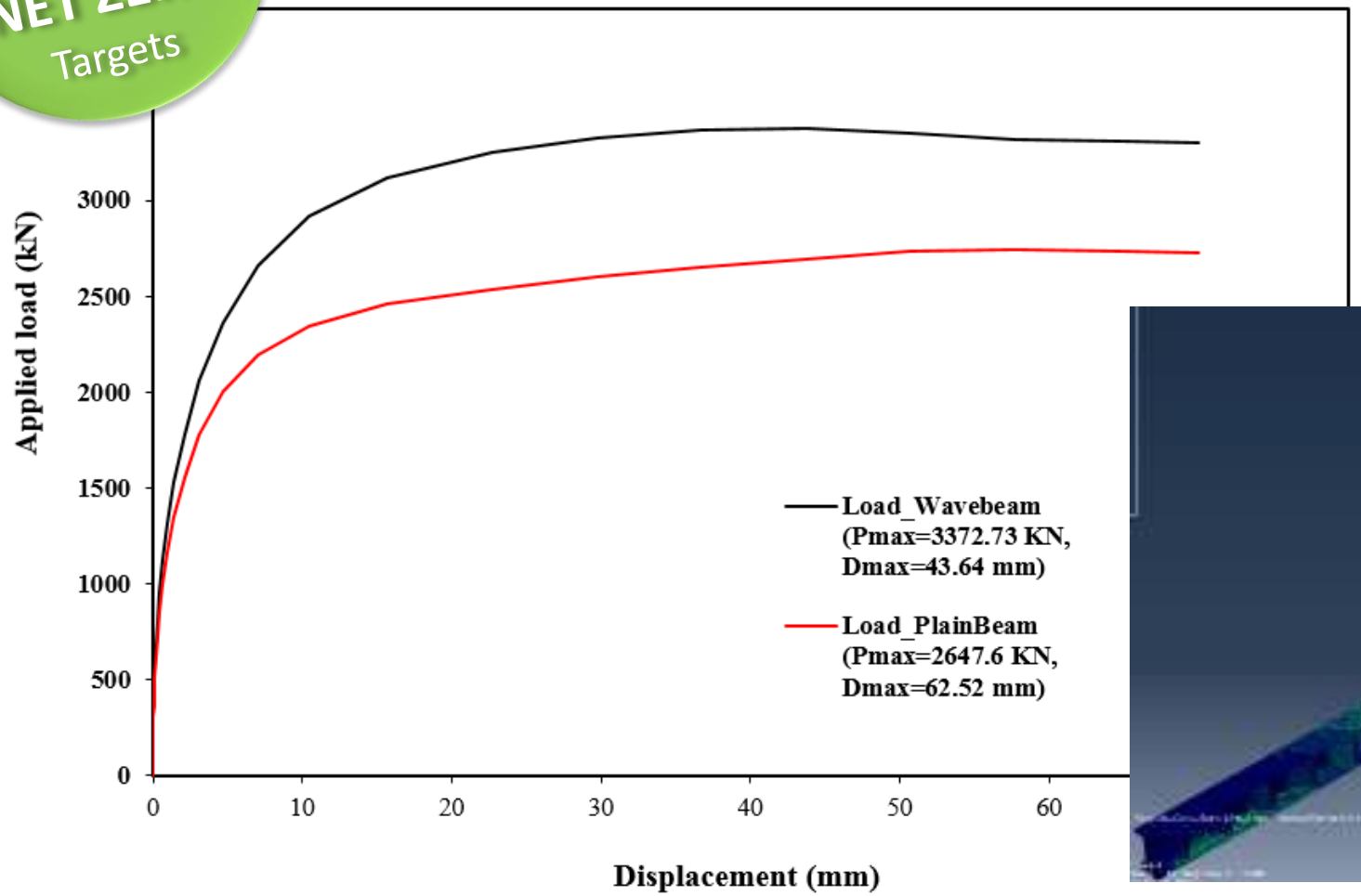
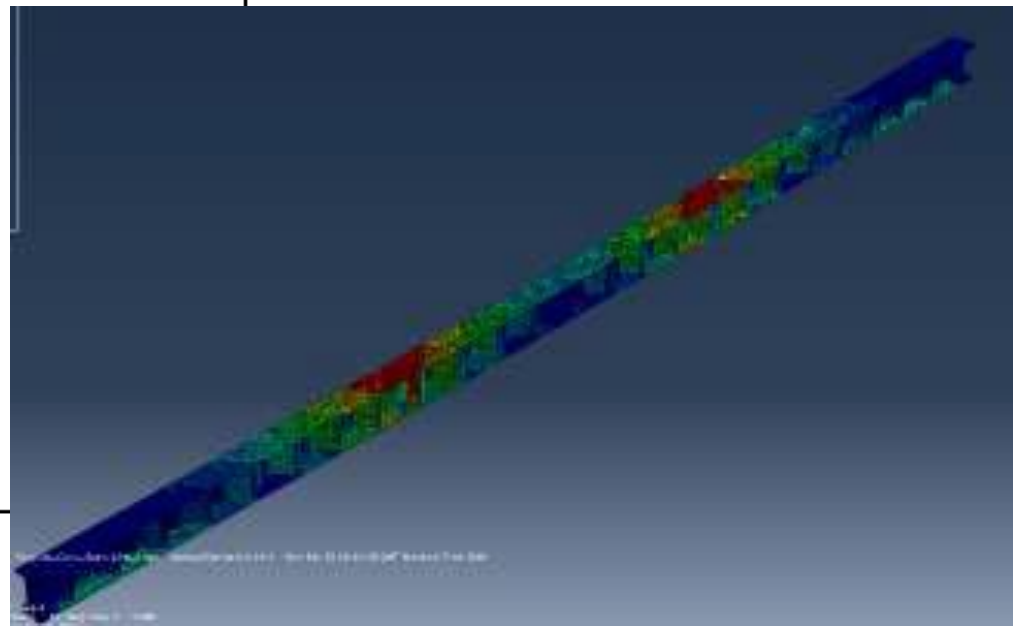
4-Point Bending

Sample analyses of University of Strathclyde results





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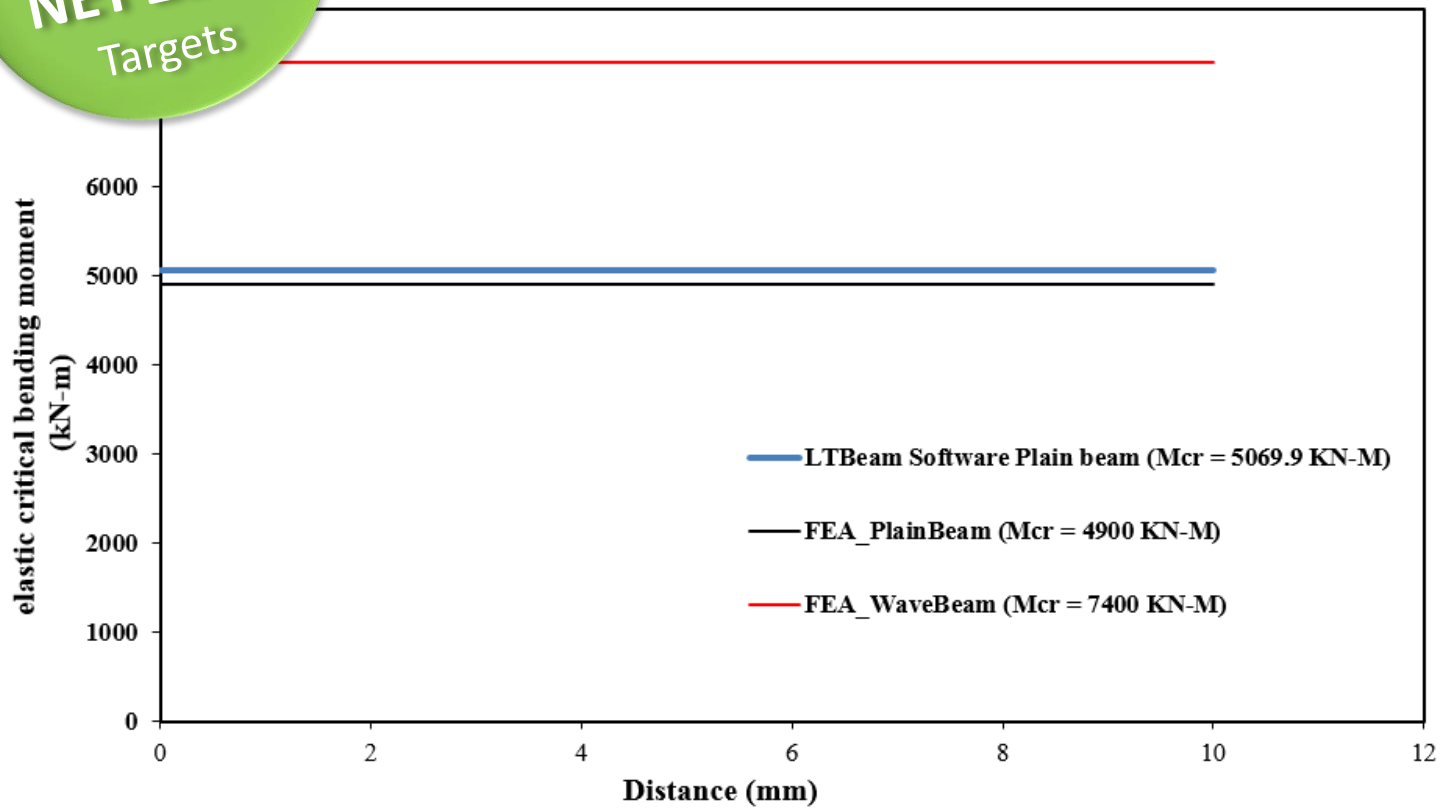
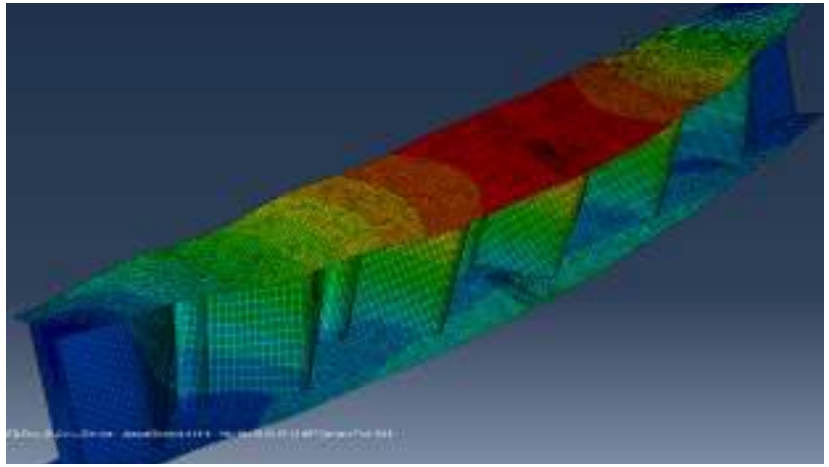
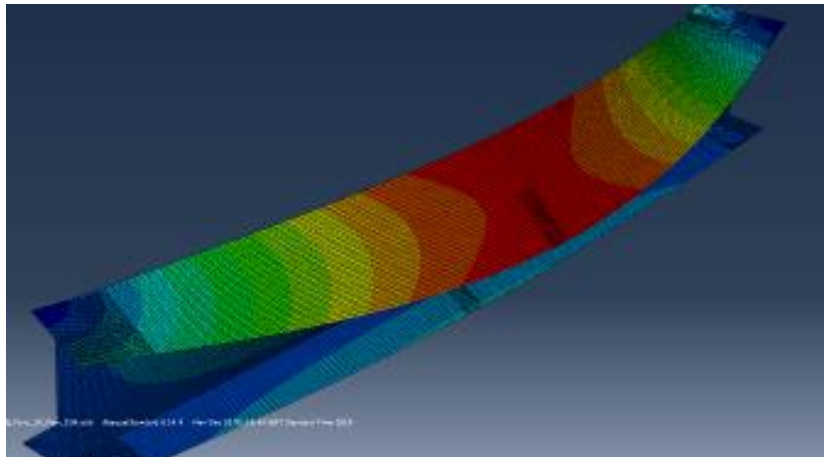
Lateral Torsional Buckling (LTB) **Eigenvalue Analysis**

Sample analyses of University of Strathclyde results







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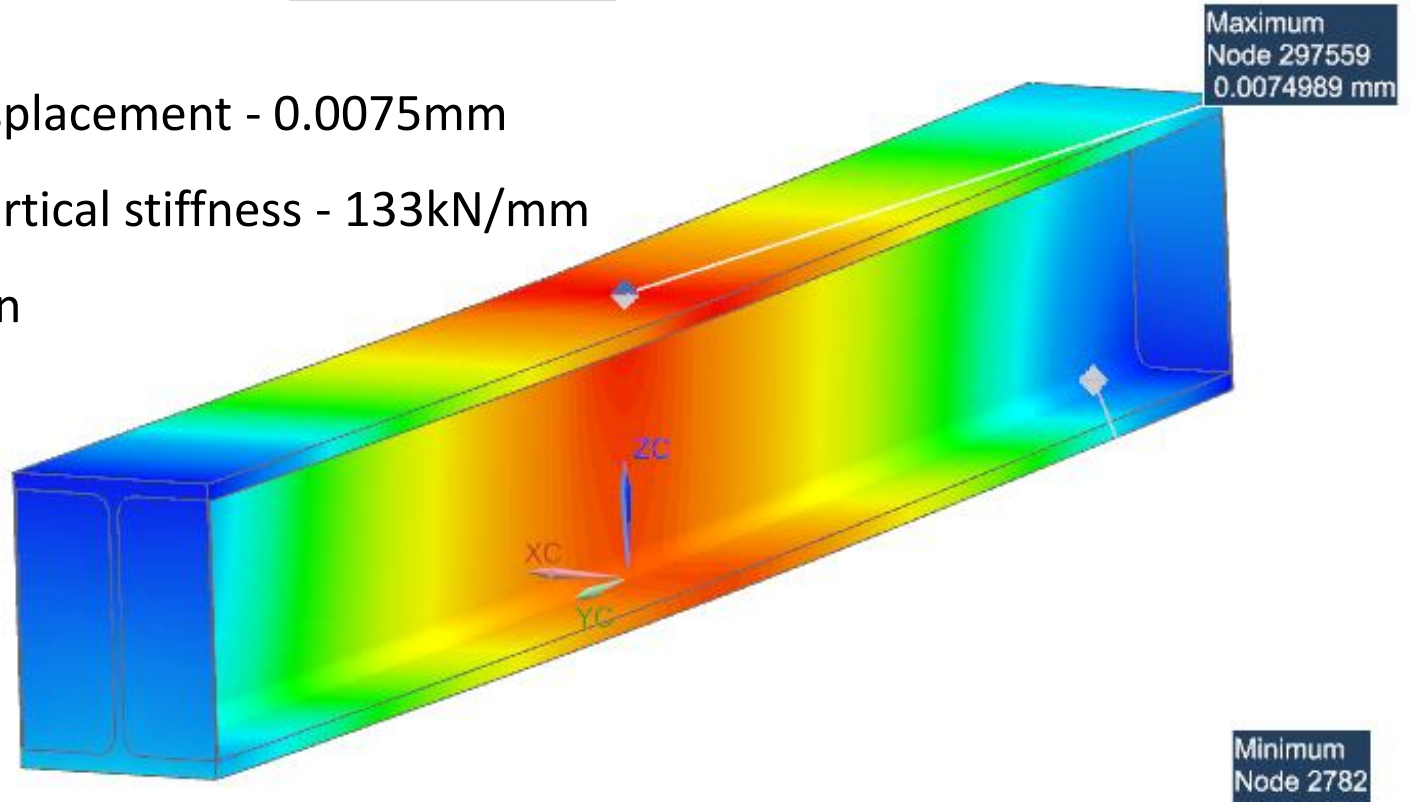
wave beam

I-Beam Bendi

- ❑ Max mid-displacement - 0.0075mm
- ❑ Midpoint Vertical stiffness - 133kN/mm
- ❑ 3 metre span



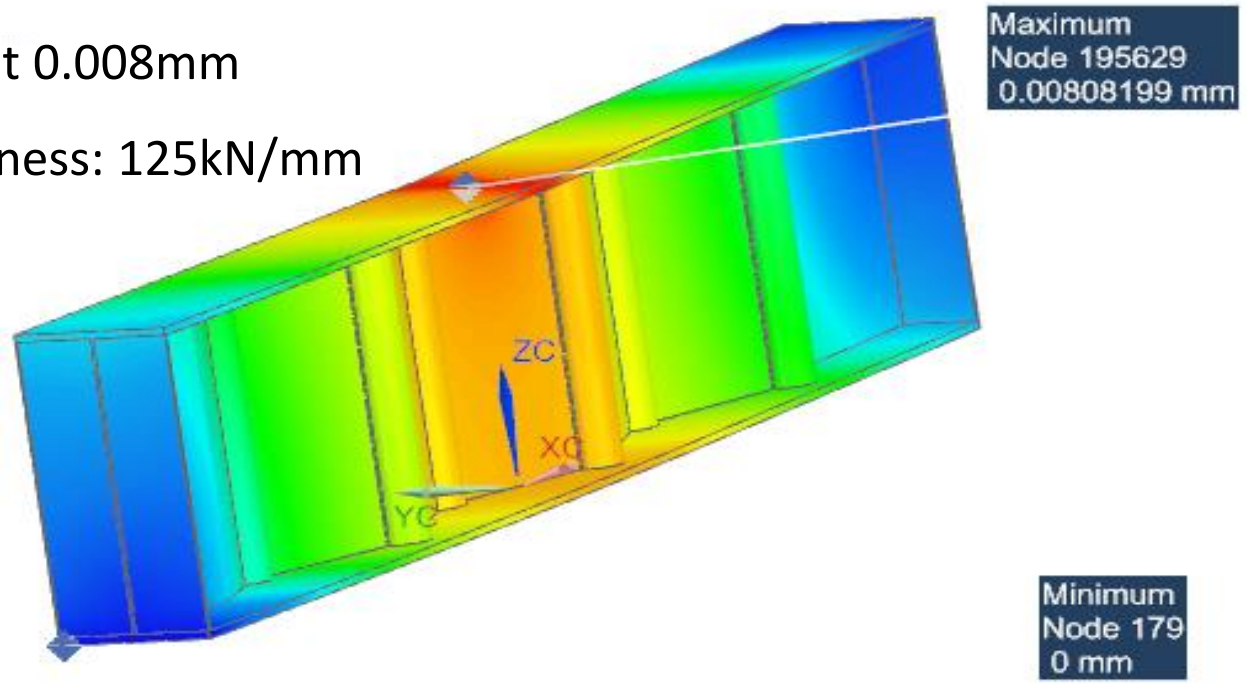
Sample analyses of University of NMIS Work

Helping the UK achieve **NET ZERO** Targets

wave beam

Wavebeam Bending

- ❑ Max mid-displacement 0.008mm
- ❑ Midpoint Vertical stiffness: 125kN/mm
- ❑ 3 metre span



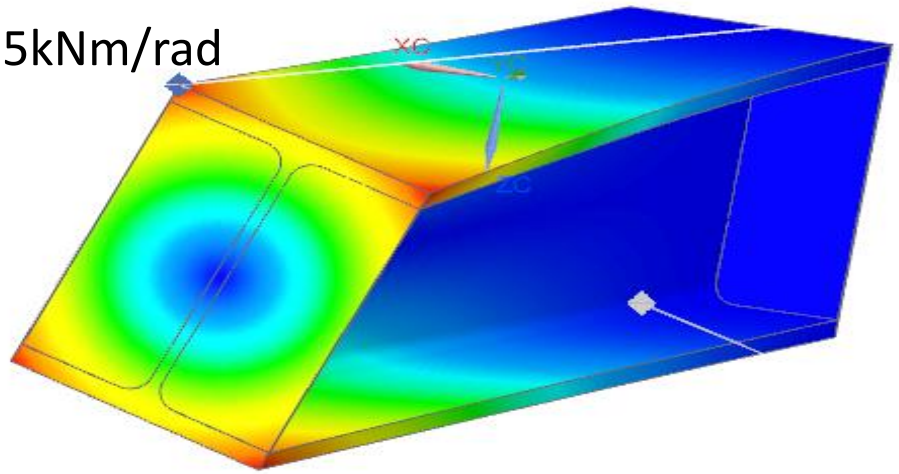
Sample analyses of University of NMIS Work

Helping the UK achieve **NET ZERO** Targets

wave beam

I-Beam Torque Loading

- ❑ End Twist Rotation - 0.186 deg
- ❑ Torsional stiffness - 185kNm/rad
- ❑ 3 metre span



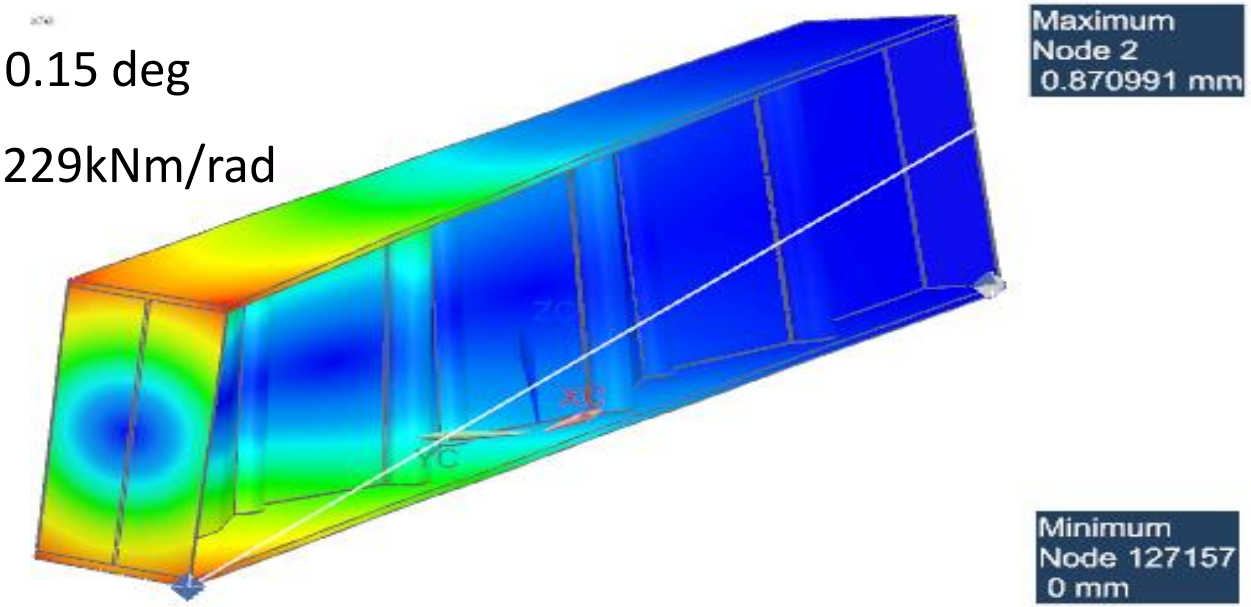
Sample analyses of University of NMIS Work

Helping the UK achieve **NET ZERO** Targets

wave beam

Wavebeam Torque Loading

- ❑ End Twist Rotation - 0.15 deg
- ❑ Torsional Stiffness – 229kNm/rad
- ❑ 3 metre span



Sample analyses of University of NMIS Work

Helping the UK achieve NET ZERO Targets

wave beam

	cription	Mass (3m)	Midpoint Vertical Stiffness	Torsional Stiffness
1	Basic I Beam 400 high x 300 wide	475kg (100%)	133kN/mm (100%)	185kNm/radian (100%)
2	Initial Wavebeam 600 high x 285 wide	343kg (72%)	154kN/mm (116%)	216.5kNm/radian (116%)
3	**Wavebeam-Welded Cylinders 600 high x 285 wide**	**330kg (69%)**	**125kN/mm (94%)**	**229kNm/radian (123%)**
4A	Wavebeam - No Cylinders 600 high x 285 wide	305kg (64%)	114kN/mm (85%)	133kNm/radian (71%)
4B	Wavebeam - Small Cylinders 600 high x 285 wide	348kg (73%)	115kN/mm (86%)	205kNm/radian (111%)
4C	Wavebeam - Flat Bar Supports 600 high x 285 wide	343kg (72%)	117kN/mm (88%)	146kNm/radian (79%)

Table of Analysis Results

wave beam

- **Lighter weight extension which uses 40% less steel to manufacture**
- **No diesel usage from floating vessels on station or traveling to assets**
- Working on the same level as the existing deck has many benefits
- No hoses or lines from the floating vessels up onto the asset
- Less slip and trip hazards also from falling or dropped objects
- Ability to operate safely in rough seas is limited for floating vessels
- Easier communications and less chances of operational mistakes
- No collision chances as in rough seas this is always a concern
- Easier logistically rather than lifting weights from floating vessel
- Less chance of hydrocarbon spills and other contaminated fluids

The amount of CO_2 emissions from steel manufacturing

is almost double the amount of steel

1.85 tonnes of carbon created per per 1 tonne of steel manufactured

Wavebeam used 35% less steel to manufacture

the frame size of our generic Floating Floor weighs 000000000 tonnes

a saving of 000000 tonnes of carbon created by using standard I beams

Source: https://www.carbonclean.com/blog/steel-co2-emissions

Helping the UK achieve **NET ZERO** Targets

wave beam

Average Dynamic Positioning Diesel Usage

(About 22.38 pounds of CO^2 are produced by burning a gallon of diesel fuel)

http://www.patagoniaalliance.org/wp-content/uploads/2014/08/

A fully loaded PSV with the following parameters of the propulsion

Main engines 4*1470 kW at main propellers / 2*2200 kW (diesel-electric)

Bow thrusters: tunnel kW/1200 UL 1201/4940/883 kW/1200

On average would use 150 galloons per/hr to maintain a Dynamic Positioning

This equates to 233 tonnes of carbon per month

Average Dynamic Positioning Diesel Usage

During Plug and Abandonment activities, equates to a combine monthly saving of

259 tonnes of carbon

if a Wavebeam Floating Floor were to be deployed with no PSV or Supply Boat involvement in the activities

Wavebeam contributing towards a sustainable post-oil future in the NorthEast of Scotland

Helping the UK achieve **NET ZERO** Targets

Let Wavebeam do the heavy lifting on corroded pipe decks and general floor areas

Tony Zaccarini
tony@wavebeam.co.uk

Wavebeam contributing
towards a sustainable post-oil future in the NorthEast of Scotland