A high wire look at the latest suite of evidence to support circular approaches in energy infrastructure

Kenny Taylor
Partner – Energy infrastructure

zerowastescotland.org.uk
@zerowastescot

European Union
gov.scot
EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future


ABOUT US
Zero Waste Scotland exists to lead Scotland to use products and resources responsibly, focusing on where we can have the greatest impact on climate change.
ZERO WASTE SCOTLAND

The Linear Economy

A successful linear economy depends on two basic assumptions:

1)That there will always be **resources** that can be extracted

2)That there will always be an **“away”** to send our discarded materials.

Circular Tayside (2017)

What is a circular economy?

A systemic shift in the way we think and design products, based on three principles:

1. Design out waste and pollution
2. Keep products and materials in use
3. Regenerate natural systems

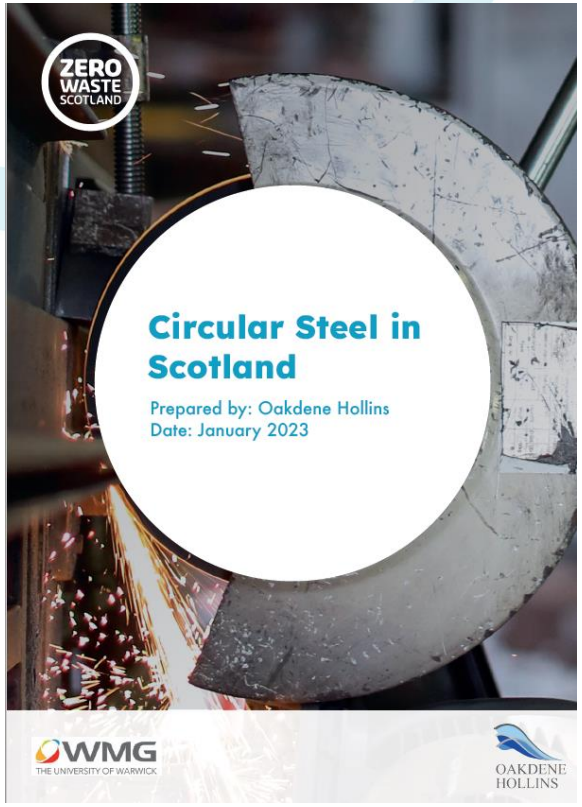
ZERO WASTE SCOTLAND

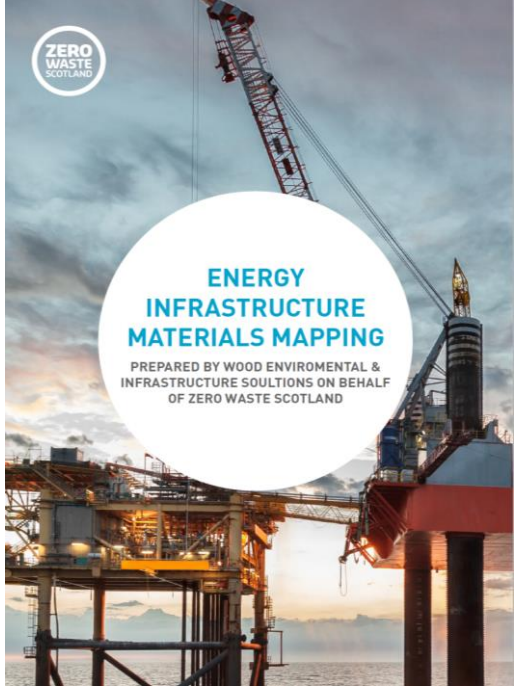
Circular decommissioning

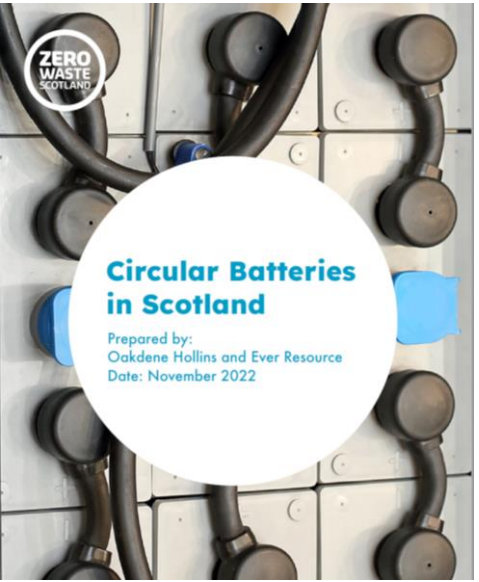
ZERO WASTE SCOTLAND

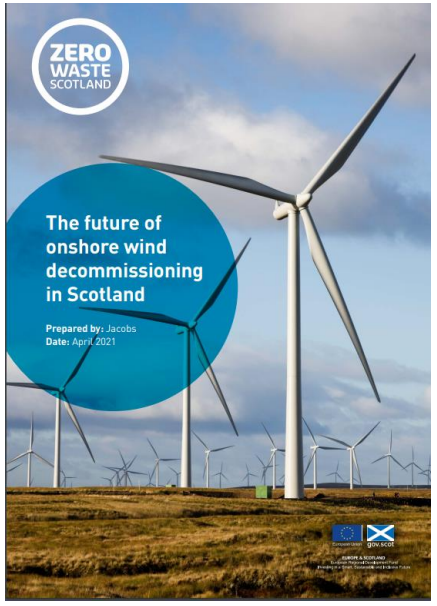
CE Energy Transition: Building the ambition

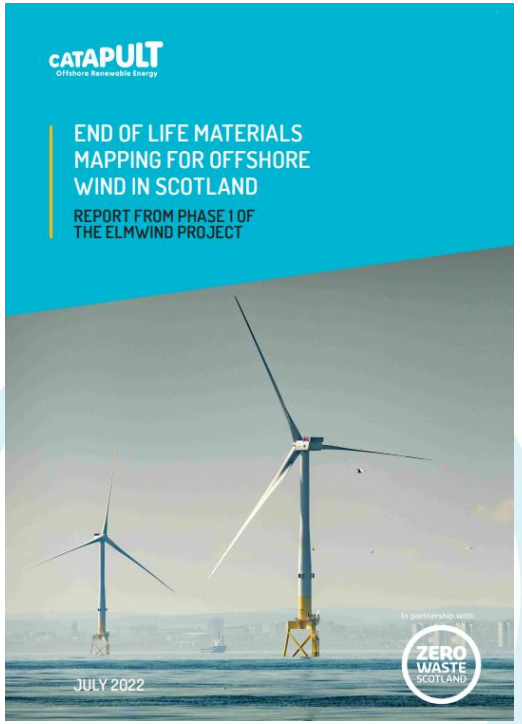
ZWS's supporting evidence











Energy Infrastructure Materials Mapping

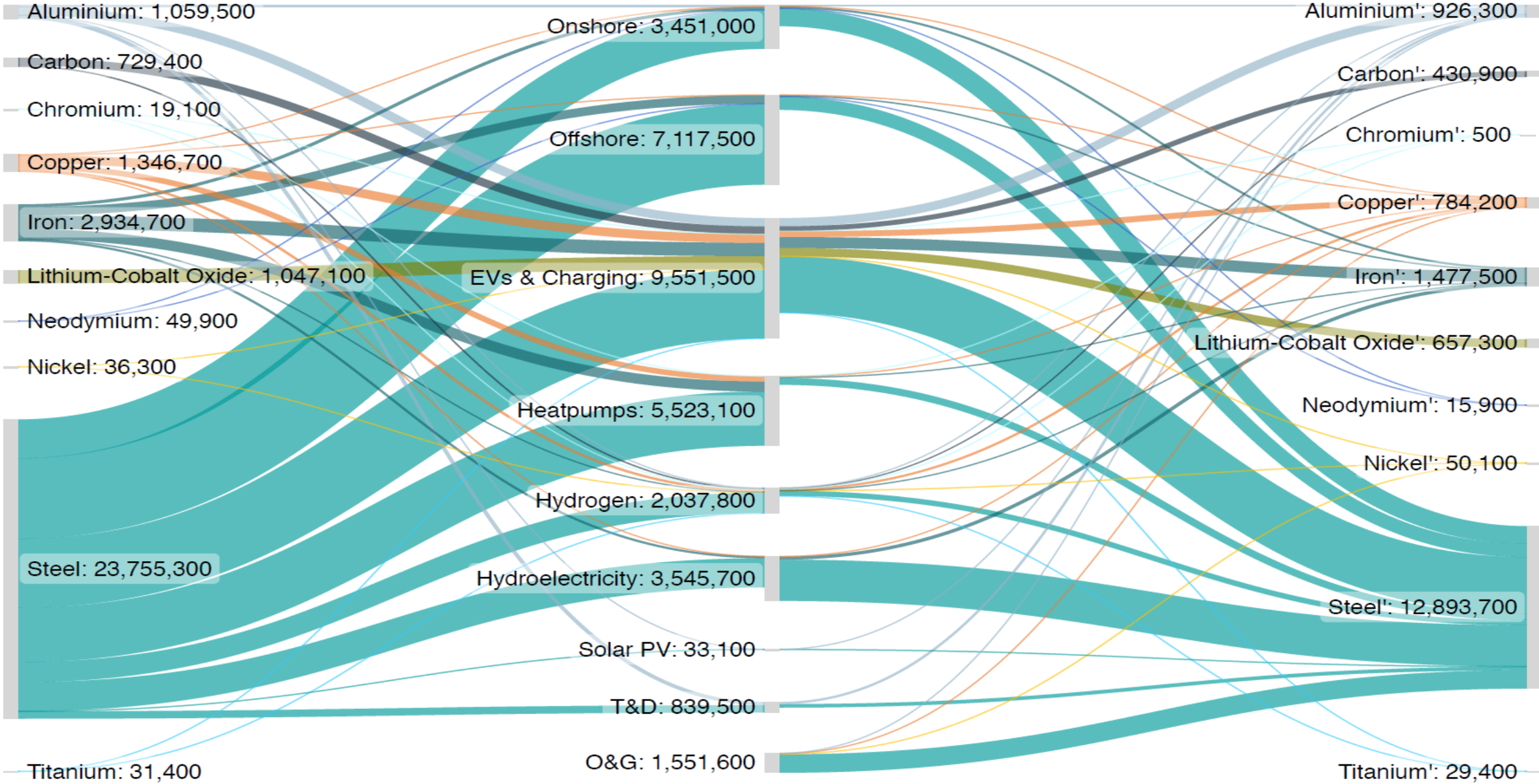
- High-level approximations of the materials required for, and generated by, seven low-carbon energy technologies, onshore grid infrastructure and Oil & Gas decommissioning up to 2050.

- Headline figures: from a 2018 baseline of 65Mt of material to a demand for over **240Mt** by 2050.

- We have the answer to the question ‘what is the materials demand?’

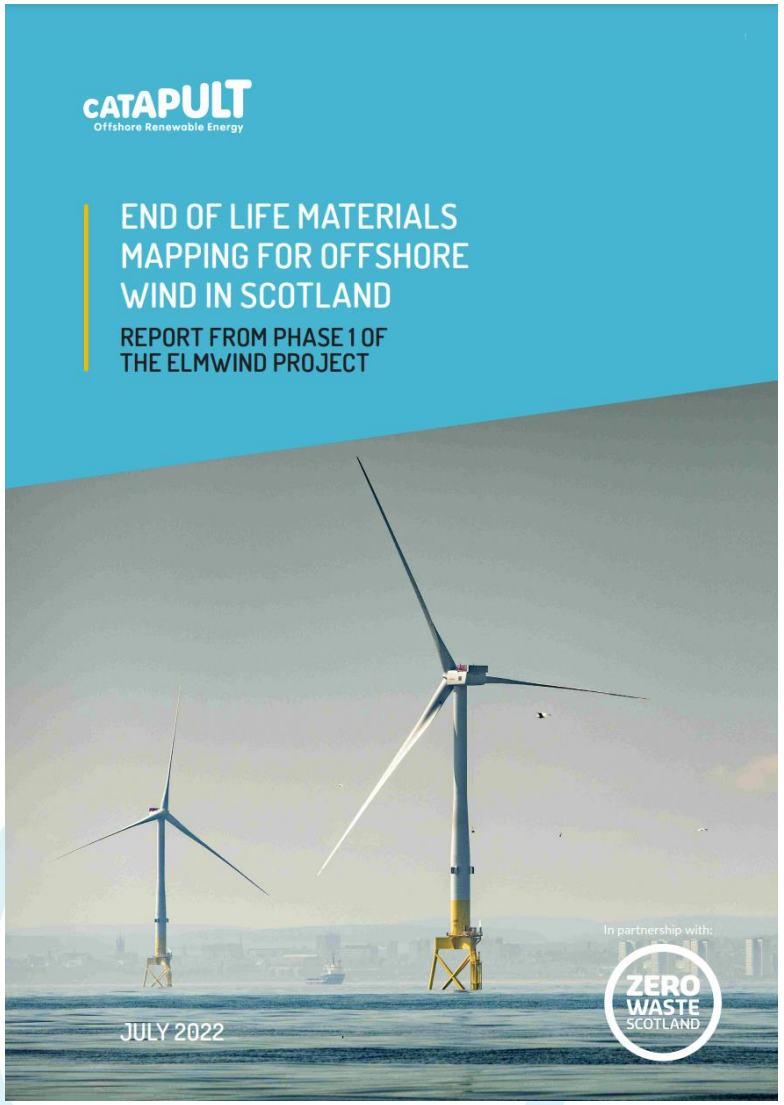
- Further research planned around concrete and critical raw materials

Figure 3.5 Sankey diagram of the materials required and generated up to 2050*

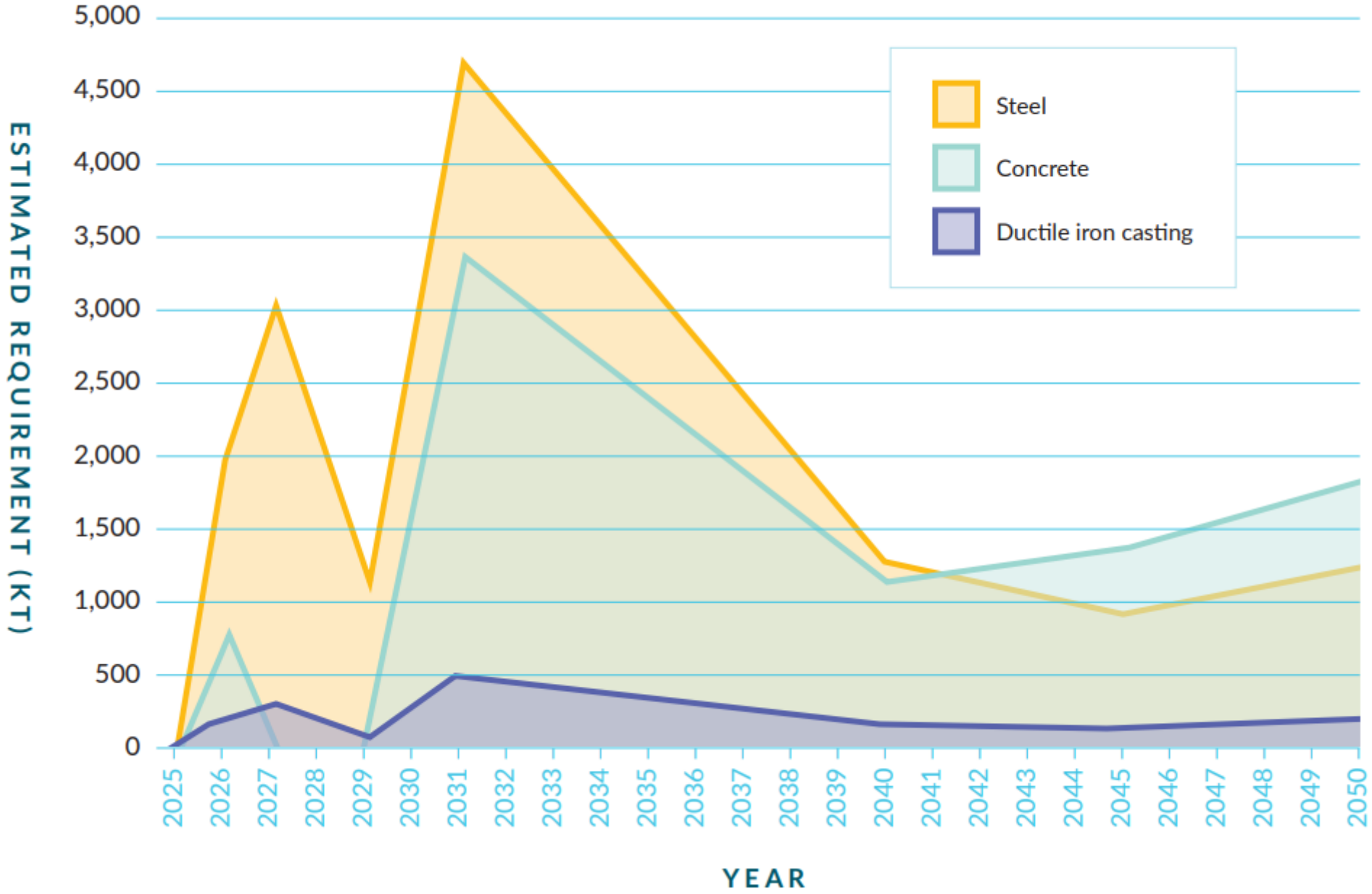


Offshore Wind

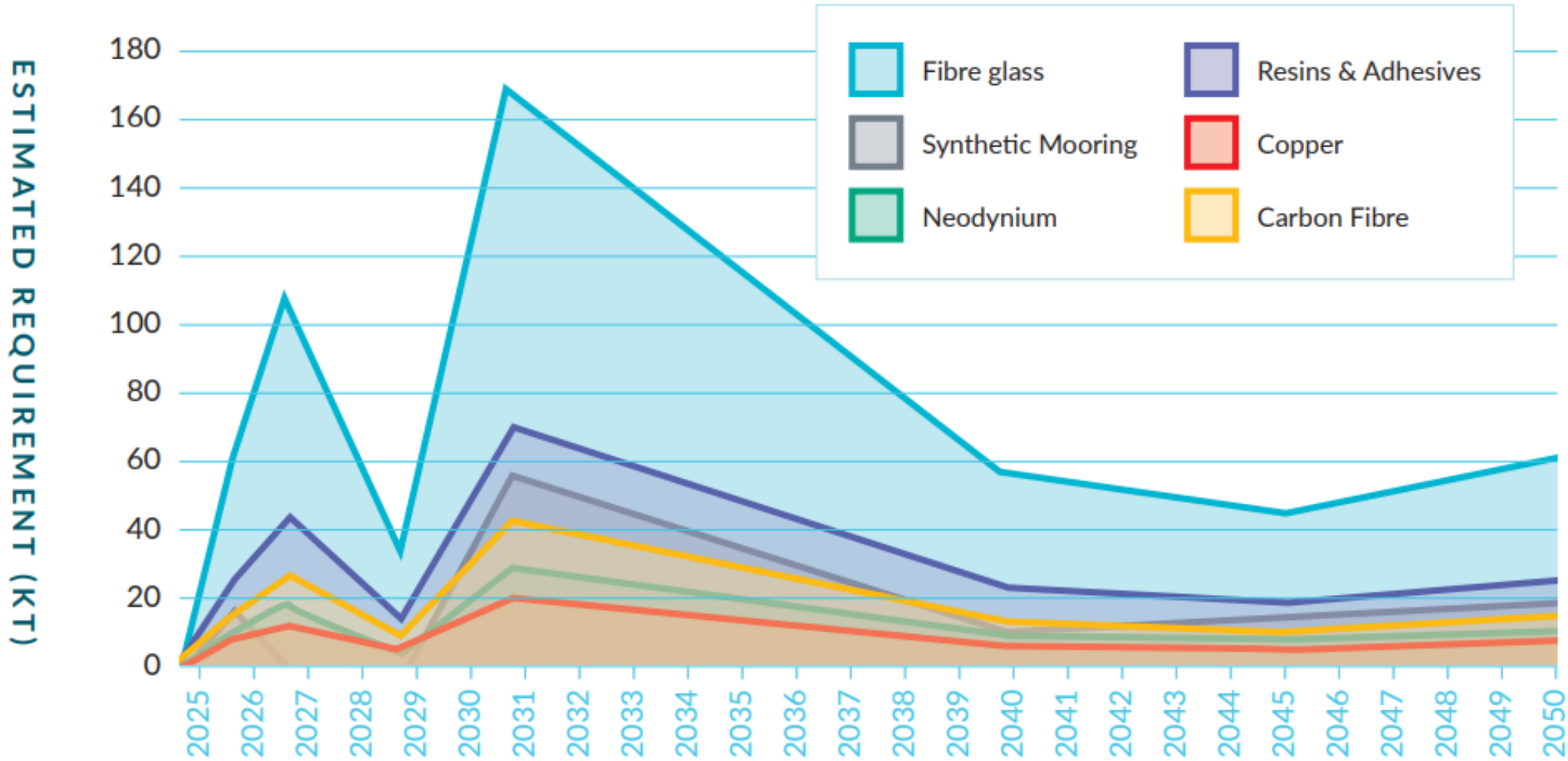
Partnership project with ORE Catapult to quantify the materials arising from offshore wind decommissioning and material demand for planned offshore wind deployment in Scotland – to 2050.



MATERIAL REQUIREMENT 2025-2050



MATERIAL REQUIREMENT 2025-2050



Steel Reuse & Reprocessing Reports

Today, producing 1 tonne of steel from Scottish scrap sent to Turkey **emits 1.6 tonnes of greenhouse gases**.

Producing 1 tonne of scrap steel in an Electric Arc Furnace (EAF) plant in Scotland **could reduce this to 0.64 tonnes of greenhouse gases**.

Scotland's **low carbon electricity grid** presents a significant advantage to steel producers.

Additional carbon savings are possible through encouraging **local reuse** of steel.

Development of further evidence on steel reuse and reprocessing needed i.e., **full Life Cycle Analysis**

ENERGY

GREEN JOBS AND SKILLS

Circular projects at ports are providing the energy sector workforce with opportunities to transition or expand into high-value **green energy jobs.**

REUSE OF MATERIALS

Businesses at ports are undertaking **decommissioning** and **deconstruction** services for marine and oil and gas industries, and using these materials to feed into onward construction and renewables projects.

SUPPORTING ACTIVITIES FO OFF - SITE MANUFACTURE AN ASSEMBLY

Ports act as hubs for **renewables projects**, optimising the use and reuse of materials in offshore renewables manufacturing and assembly, and onshore renewables decommissioning.

GREEN ENERGY

Ports are actively providing strategic locations for the development of green energy projects e.g., **hydrogen generation and storage.**

RENTING AND LEASING ASSETS

Ports are offering enterprises an opportunity to **rent or lease** critical spares and **high-value equipment** required to support energy projects.

COLD IRONING

Ports enable **cold ironing** for docked vessels which will link to renewable energy generation made available at the site.

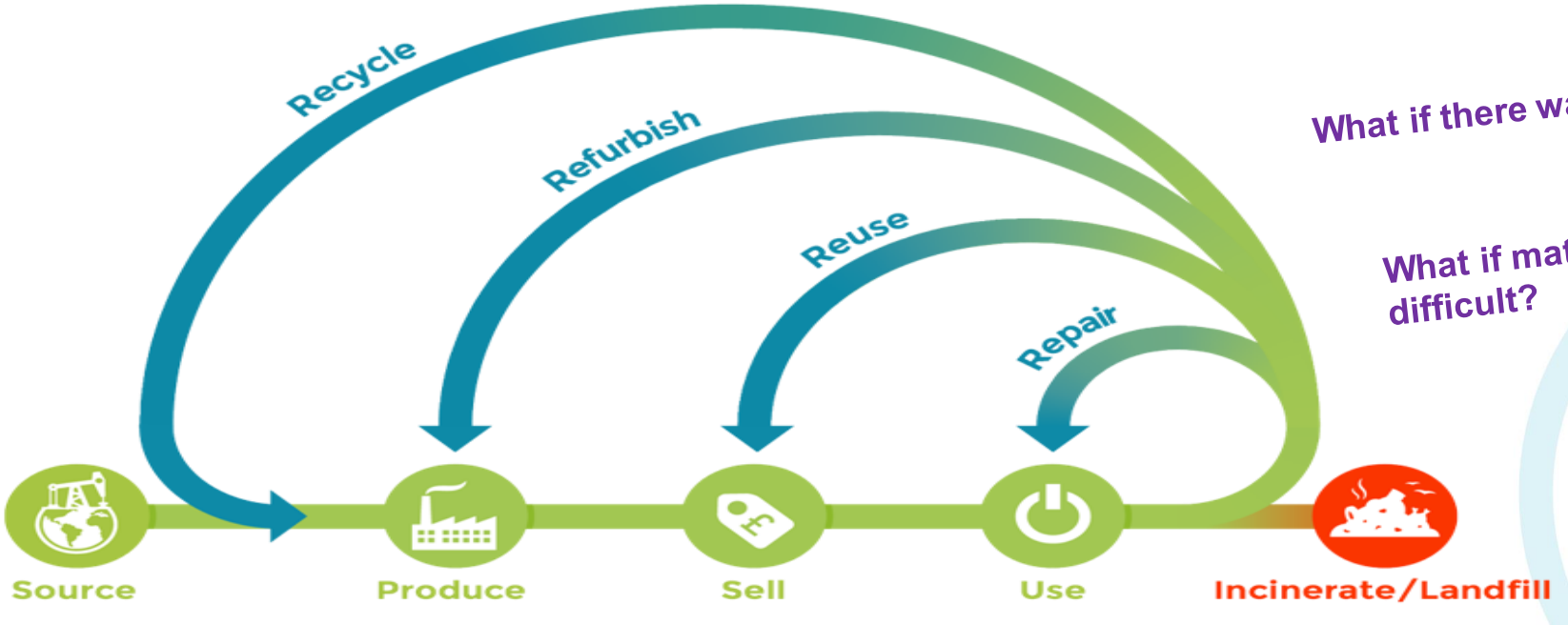
Concluding on a Circular economy

2045: Beyond net zero

- Scotland has minimised its contribution to climate change, and its ecological and social impact on other countries

- Supply chains are resilient and there is a secure feedstock of critical materials from circular practices

- Local economies are thriving and there is skilled job creation



What if there was a global shortage of a critical metals?

What if material import / export was more difficult?