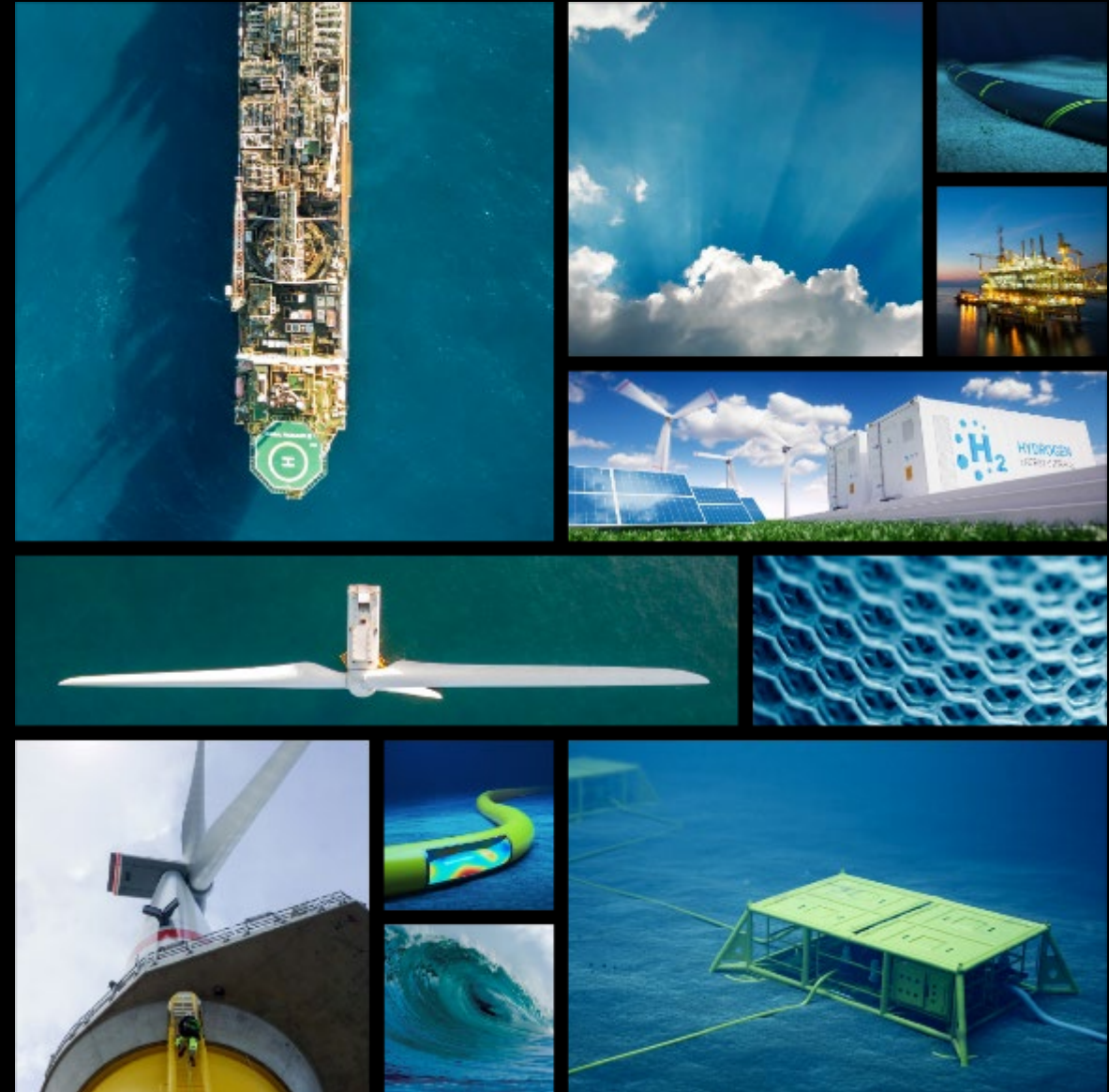




Quantifying GHG
emissions for offshore
decom projects:
Realising the challenges
and the benefits.

Dr Deborah Morgan

WWW.XODUSGROUP.COM





O & G DECOMMISSIONING ACTIVITIES AND EMISSIONS

- Energy Transition initial focus on operational emissions
- Focus shift to project -based emissions as operational emissions decrease





O & G DECOMMISSIONING ACTIVITIES AND EMISSIONS

SCOPE 1 (DIRECT) EMISSIONS:



**FLARING &
VENTING**



**GENERATORS &
TURBINES**



P&A

SCOPE 3 (SUPPLY CHAIN) EMISSIONS:



P&A



**NEW
MANUFACTURE**



VESSELS



**ONWARD
TRANSPORT**



HELICOPTERS

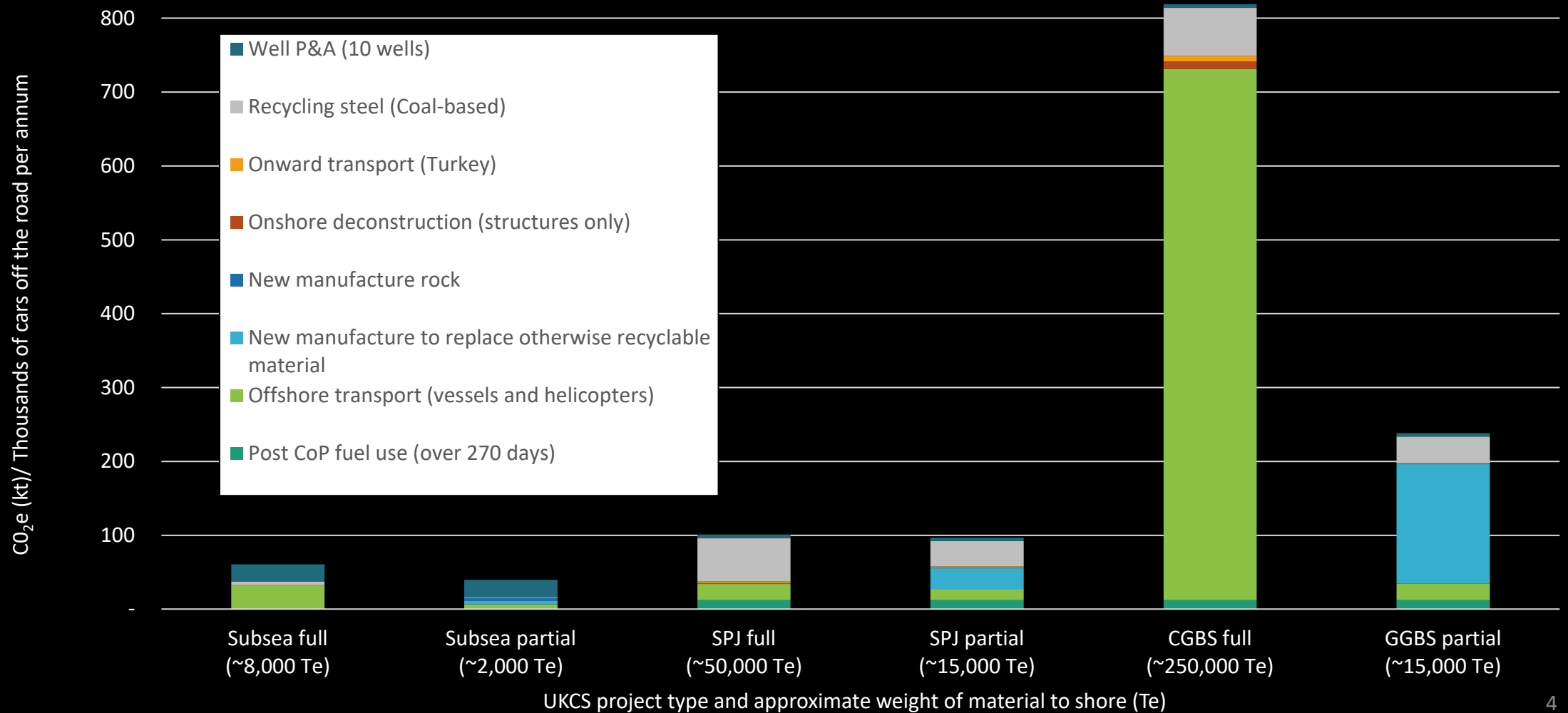


RECYCLING



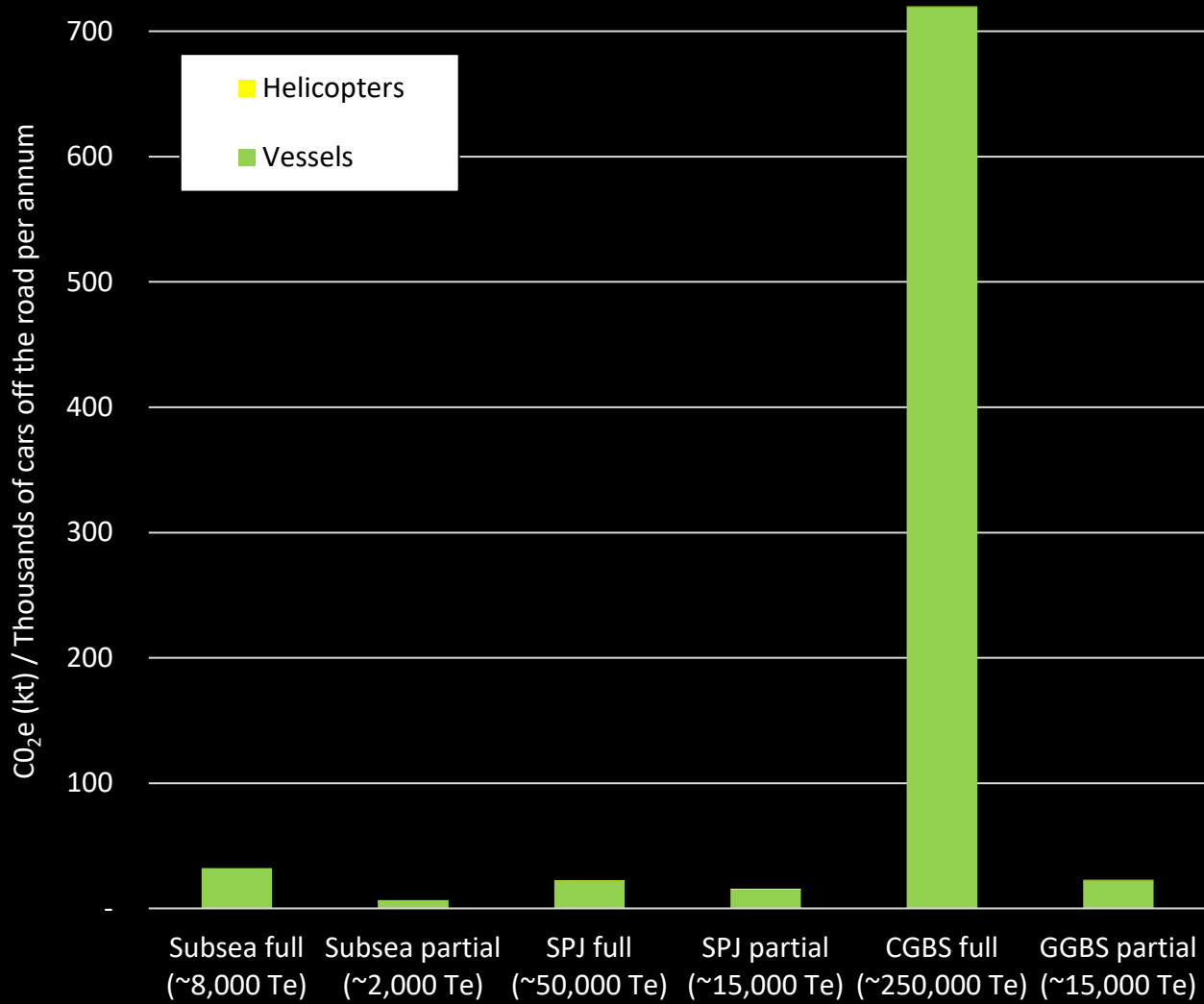
O&G DECOMMISSIONING ACTIVITIES AND EMISSIONS: SUMMARY

Context: Average new petrol car in UK emits ~ 1Te CO₂ per annum (Source EEA, 2020)





O&G DECOMMISSIONING ACTIVITIES AND EMISSIONS: OFFSHORE TRANSPORT



UKCS project type and approximate weight of material to shore (Te)

Challenges:

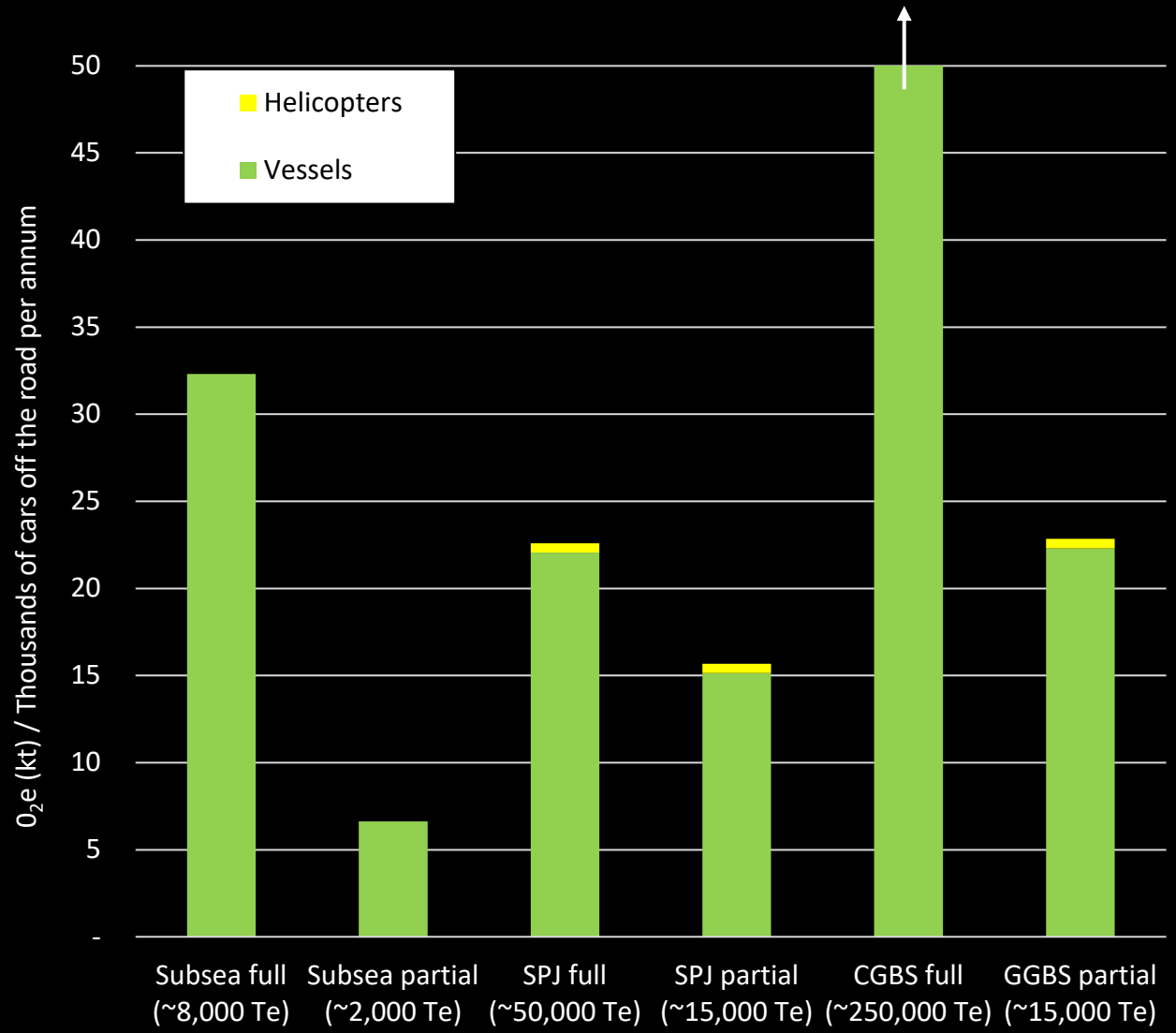
- Secondary data sources for vessel emissions outdated therefore focus needs to be on primary data collection to corroborate or amend
- Approach to vessel emissions calculations may vary across the supply chain

Benefits:

- Can provide insight for PMs to make informed decisions where offshore transport emissions are a driver
- Can be used to identify efficiencies and drive technological improvements across the supply chain



O&G DECOMMISSIONING ACTIVITIES AND EMISSIONS: OFFSHORE TRANSPORT



UKCS project type and approximate weight of material to shore (Te)

Challenges:

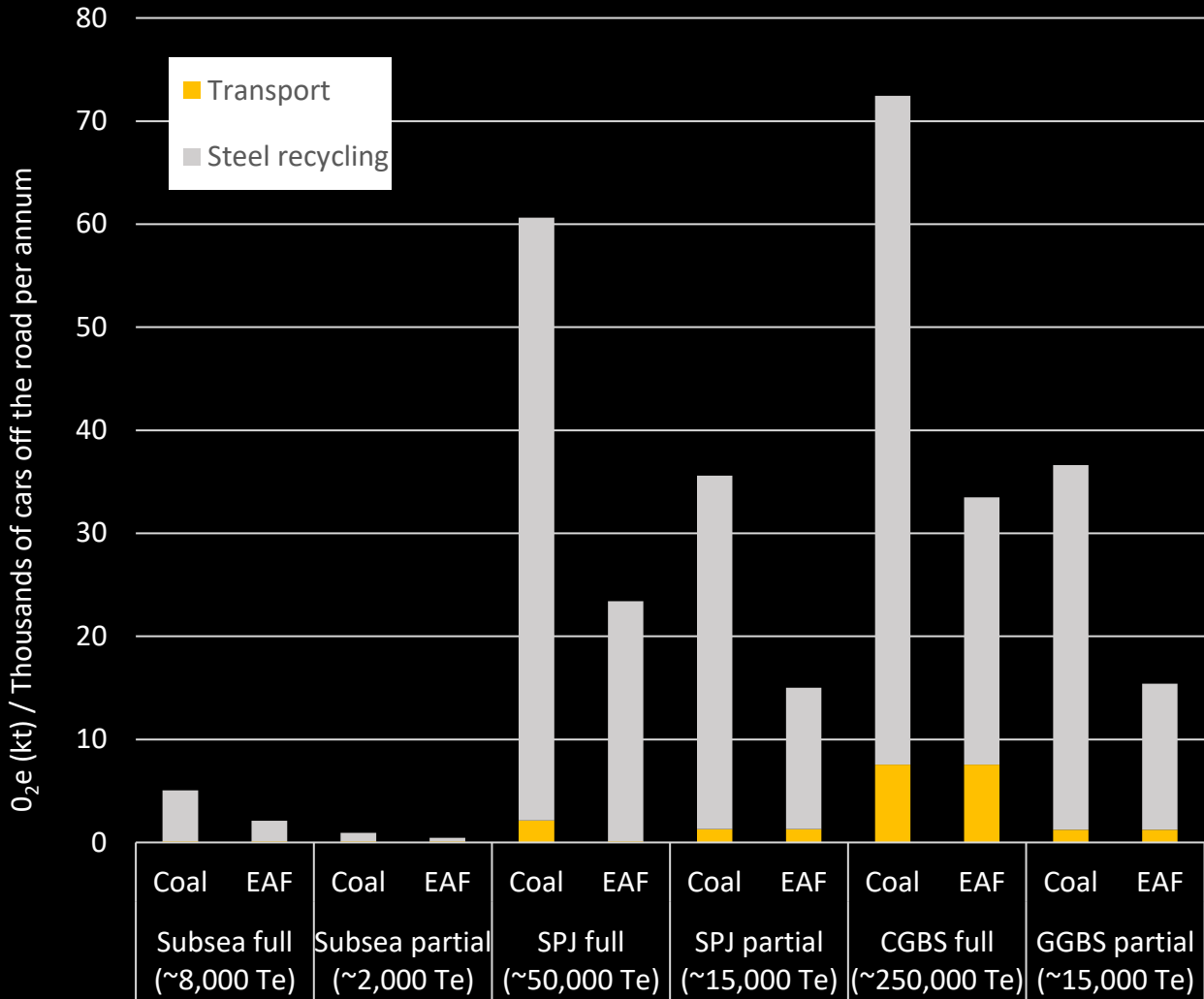
- Secondary data sources for vessel emissions outdated therefore focus needs to be on primary data collection
- Approach to vessel emissions calculations may vary across the supply chain

Benefits:

- Can provide insight for PMs to make informed decisions where offshore transport emissions are a driver
- Can be used to identify efficiencies and drive technological improvements across the supply chain



O&G DECOMMISSIONING ACTIVITIES AND EMISSIONS: ONWARD TRANSPORT AND RECYCLING



Challenges:

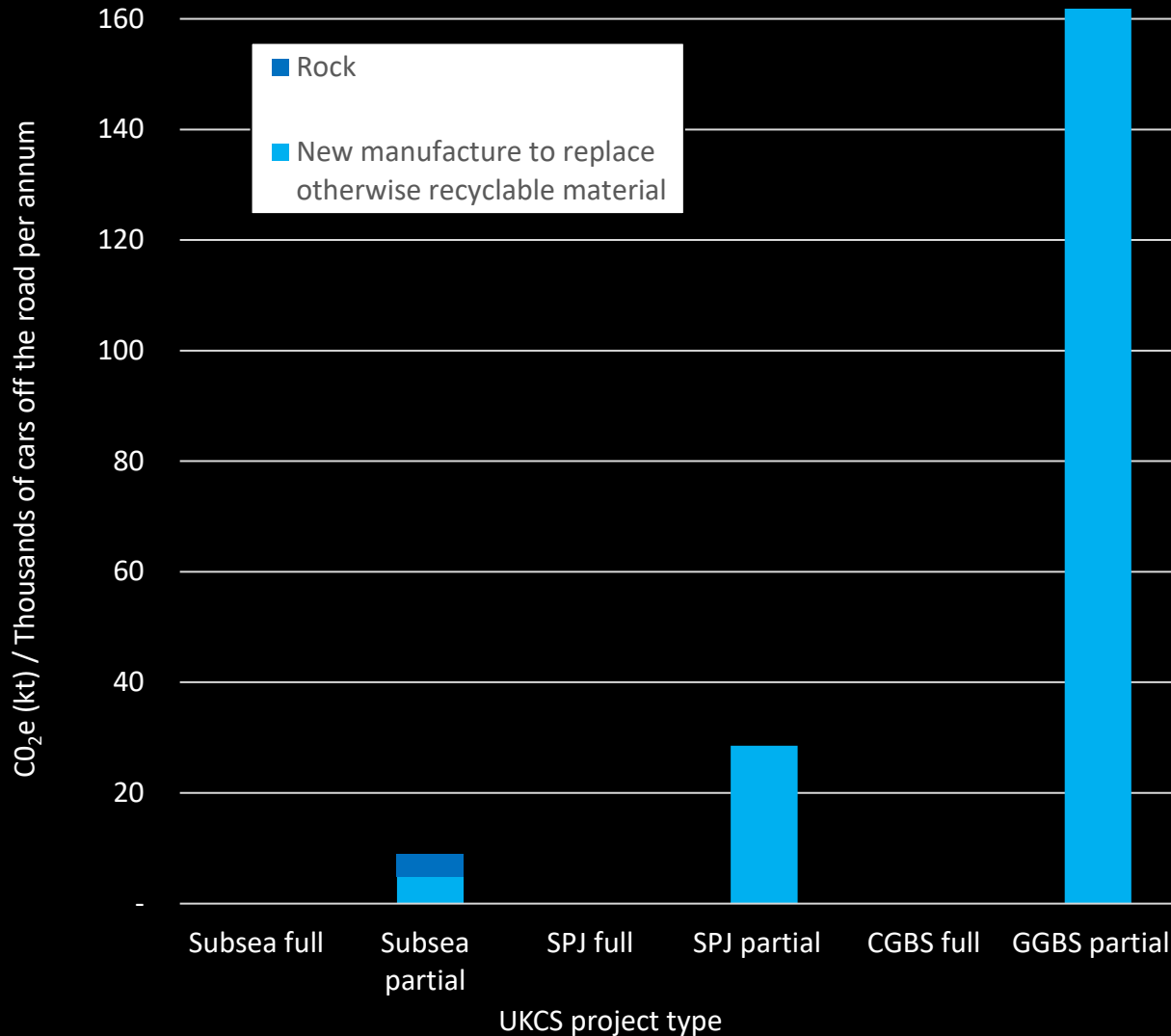
- Understanding final destination/ segregating waste by project
- Hazardous treatment emissions not defined

Benefits:

- Recognise contrast between coal -based and Electric Arc Furnace (EAF) emissions
- Highlights that recycling method is more important than the journey



O&G DECOMMISSIONING ACTIVITIES AND EMISSIONS: NEW MANUFACTURE



Challenges:

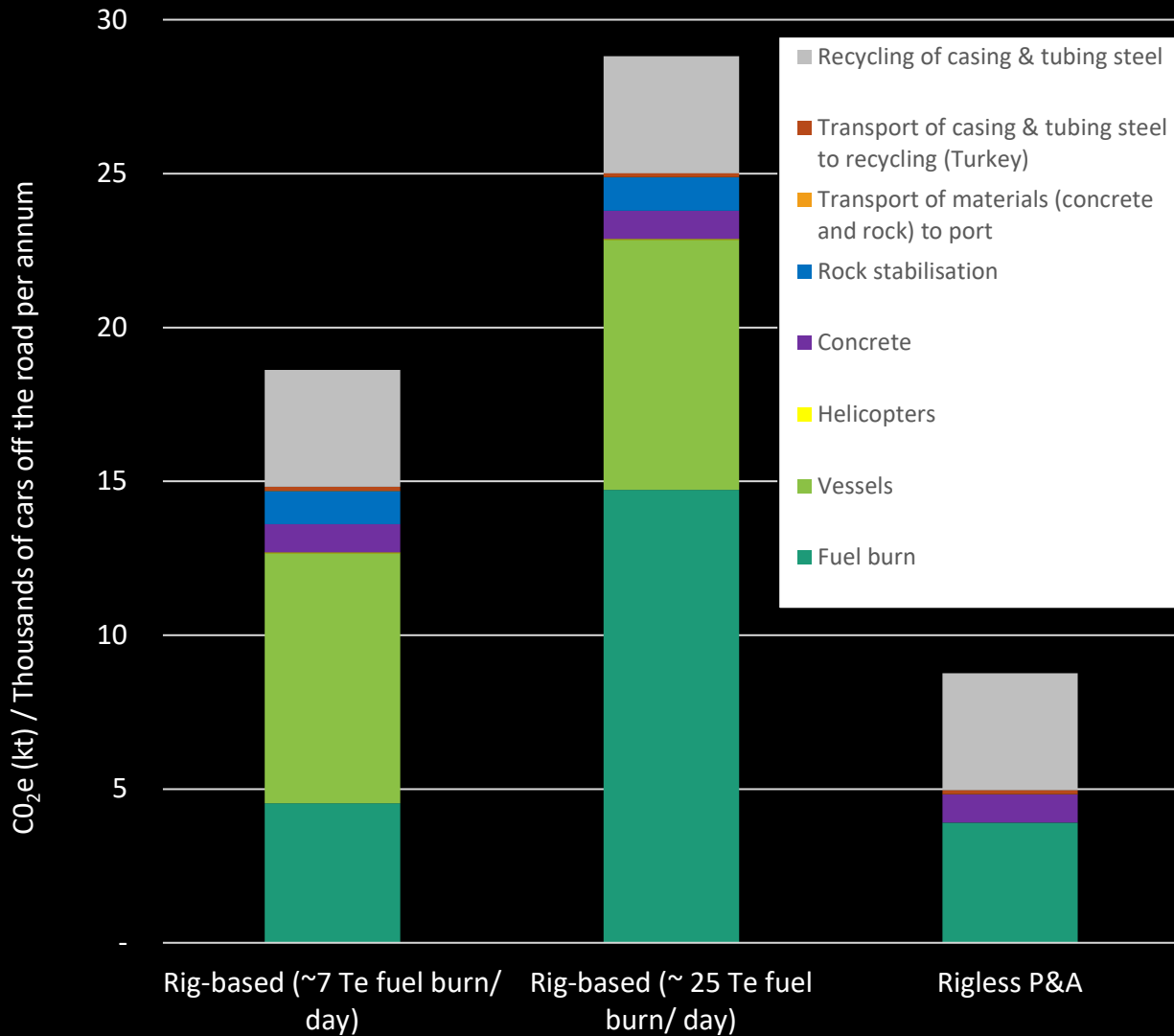
- Carbon vs emissions assessment?

Benefits:

- Ability to compare decommissioning options without bias
- Considers embodied carbon as part of the bigger picture and the need to account for circular economy



O&G DECOMMISSIONING ACTIVITIES AND EMISSIONS: WELL P&A



Challenges:

- Complex category with multiple aspects requiring definition
- Highly variable depending on rig type

Benefits:

- Transparency during procurement
- Identify opportunities for improving technology and efficiencies

***NOTE:** To ensure accurate comparison, each project example shown accounts for 10 moderately complex wells decommissioned and worst case for casing and tubing removed.

UKCS project type and approximate weight of material to shore (Te)



SEEING THE BIGGER PICTURE

O&G decom activity globally (S&P Global, 2021)

- 2,800 fixed platforms
- 160 floating platforms
- 18,500 wellheads
- 2,850 subsea trees
- 83,000 km offshore pipelines and umbilicals



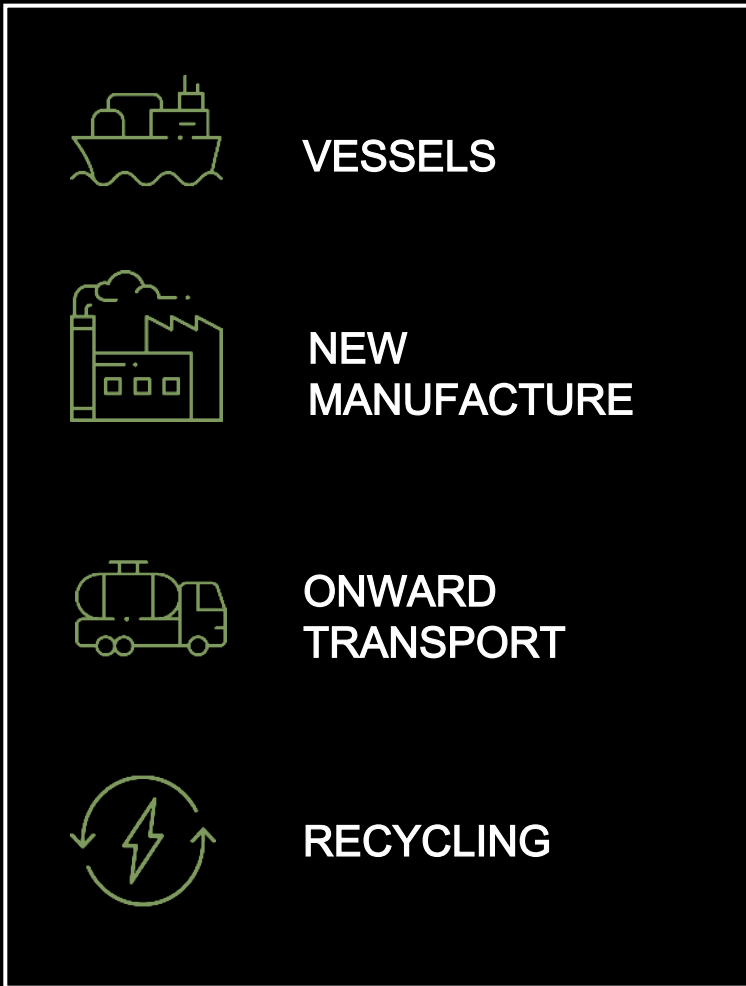
Renewables decom activity (Europe) (University of Kent, 2021):

- UK to decommission 1,600 early-model offshore turbines by 2030, each with an average of 100 Te of steel for recycling.
- Onshore turbines - currently over 5,000 older than 20 years in Europe

Also development, workovers, other renewables projects to consider...



SEEING THE BIGGER PICTURE



- Decommissioning and development project -based emissions will increase due to the energy transition
- Emissions categories applicable to decom also apply across the wider energy industry
- Xodus developing a digital solution to carbon and emissions calculations using cross -discipline and international approach
- Focus is on consistency, using industry standards and using the most recent data possible to enable benchmarking
- Highlighting marginal gains across the energy industry can lead to emissions and cost savings on global scale



Thank you for listening