NET ZERO BASIN

Pilot field development

ORCADIAN ENERGY

Disclaimer

This presentation and its enclosures and appendices (the "presentation") have been prepared by Orcadian Energy plc (the "Company") exclusively for information purposes. This presentation has not been reviewed or registered with any public authority. This presentation is confidential and may not be reproduced, further distributed to any other person or published, in whole or in part, for any purpose. By viewing this presentation, you agree to be bound by the foregoing restrictions and the other terms of this disclaimer.

The distribution of this presentation and the offering, subscription, purchase or sale of securities issued by the Company in certain jurisdictions is restricted by law. Persons into whose possession this presentation may come are required by the Company to inform themselves about and to comply with all applicable laws and regulations in force in any jurisdiction in or from which it invests or receives or possesses this presentation and must obtain any consent, approval or permission required under the laws and regulations in force in such jurisdiction, and the Company shall not have any responsibility or liability for these obligations.

This presentation does not constitute an offer to sell or a solicitation of an offer to buy any securities.

The contents of this presentation are not to be construed as legal, business, investment or tax advice. Each recipient should consult with its own legal, business, investment and tax adviser as to legal, business, investment and tax advice. In making an investment decision, investors must rely on their own examination of the Company and the terms of any investment in the Company, including the merits and risks involved. Although reasonable care has been taken to ensure that the facts stated in this presentation are accurate and that the opinions expressed are fair and reasonable, the contents of this presentation have not been verified by the Company or any other person. Accordingly, no representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information and opinions contained in this presentation, and no reliance should be placed on such information or opinions.

Further, the information in this presentation is not complete and may be changed. Neither the Company nor any of its respective directors, officers or employees nor any other person accepts any liability whatsoever for any loss howsoever arising from any use of such information or opinions or otherwise arising in connection with this presentation. There may have been changes in matters which affect the Company subsequent to the date of this presentation. Neither the issue nor delivery of this presentation shall under any circumstance create any implication that the information contained herein is correct as of any time subsequent to the date hereof or that the affairs of the Company have not since changed, and the Company does not intend, and does not assume any obligation, to update or correct any information included in this presentation.

All statements other than statements of historical facts included in this presentation, including, without limitation, those regarding the Company's financial position, business strategy, plans and objectives of management for future operations, are forward-looking statements. Such forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance of achievements of the Company, or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Such forward-looking statements are based on numerous assumptions regarding the Company's present and future business strategies and the environment in which the Company will operate in the future. Various factors exist that could cause the Company's actual results, performance or achievements to differ materially from those in the forward-looking statements. These forward-looking statements speak only as of the date of this presentation. The Company expressly disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statement contained herein to reflect any change in the Company's expectations with regard thereto or any changes in events, conditions or circumstances on which any such statement is based. The Company makes no representation or warranty as to the accuracy of any forward-looking statements.

Any investment in the Company involves risk, and several factors could cause the actual results, performance or achievements of the Company to be materially different from any future results, performance or achievements that may be expressed or implied by statements and information in this presentation, including, among others, risks or uncertainties associated with the Company's business, segments, development, growth management, financing, market acceptance and relations with customers, and, more generally, general economic and business conditions, changes in domestic and foreign laws and regulations, taxes, changes in competition and pricing environments, fluctuations in currency exchange rates and interest rates and other factors. Should one or more of these risks or uncertainties materialise, or should underlying assumptions prove incorrect, actual results may vary materially from those described in this document.

The Company does not intend, and does not assume any obligation, to update or correct the information included in this presentation.

Background

- In 2018, upstream oil and gas activities in the UK accounted for four per cent of UK greenhouse gas emissions.
- Set against a 2018 baseline, the North Sea Transition Deal's targets correspond to an absolute reduction in production emissions of 10% in 2025, 25% in 2027, and 50% in 2030 on the pathway to net-zero by 2050.
- The O&G industry could significantly reduce GHG emissions (by ~2-3 MtCO2e pa) by sourcing power for its UKCS platforms either from the shore or from offshore renewables

Expected Timeline

2050 Net Zero

2030 -50% Emissions Reduction
Zero Routine Flaring

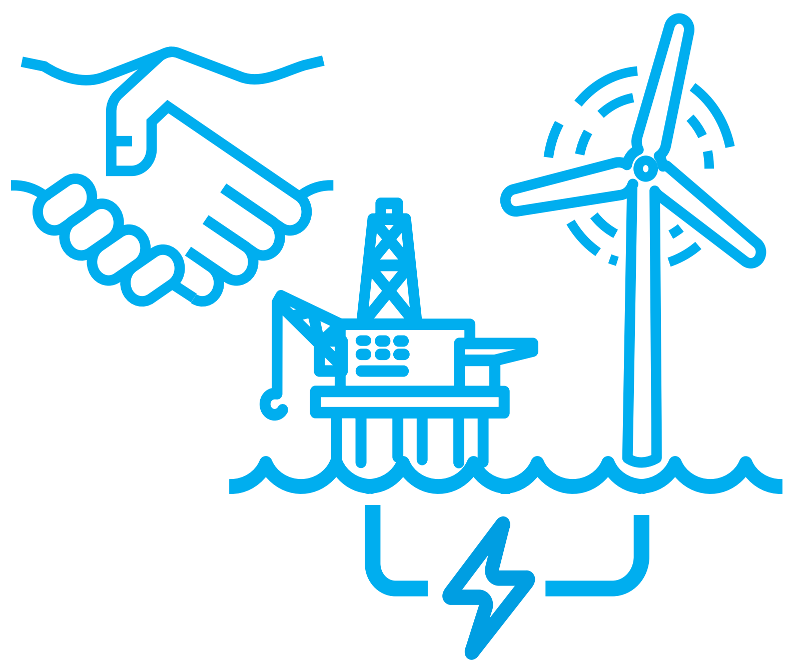
2027 -25% Emissions Reduction

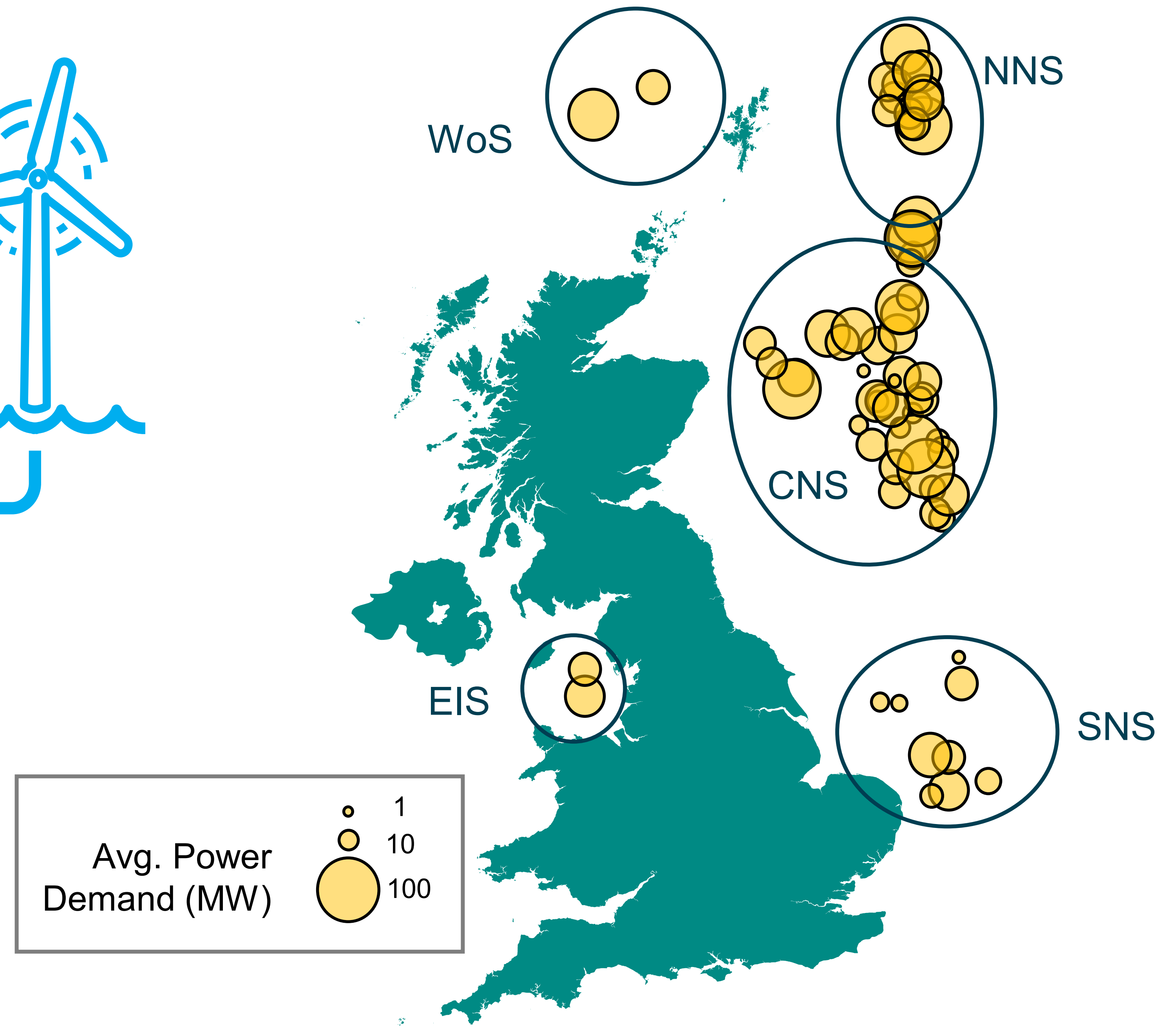
2025 -10% Emissions Reduction

2022 Concept select

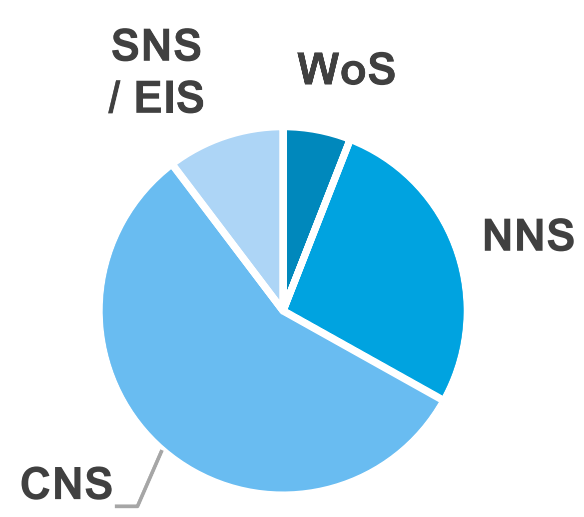
2021 / **2020** O&G / Power engagement & workshops

O&G offshore power needs (2018, EIP)

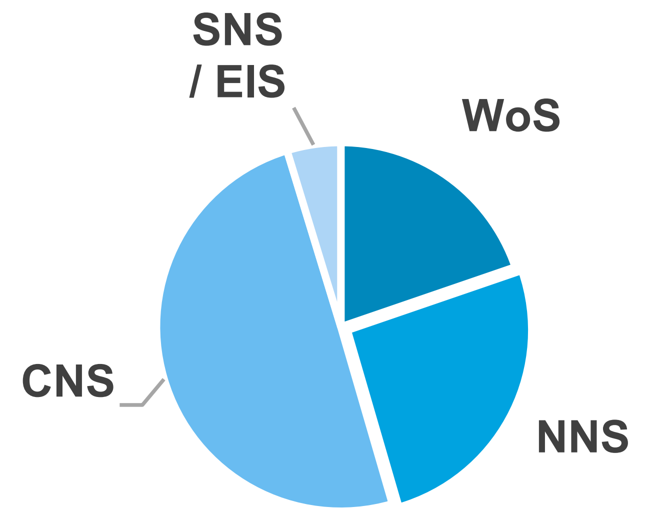




2018: 2.5 GW (avg)

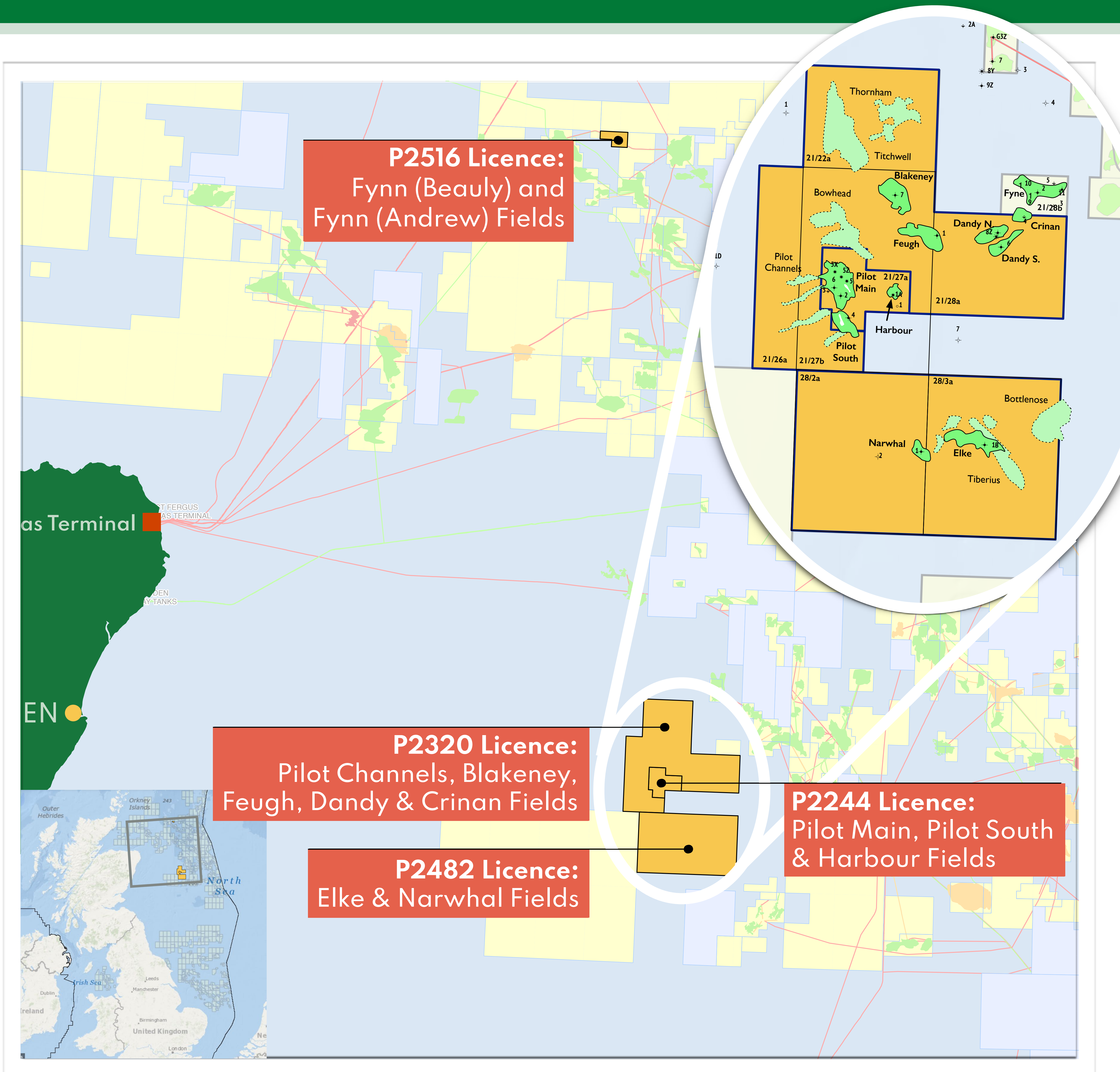


2030: 1.5 GW average



Company highlights

- Founded in March 2014, listed on AIM in July 2021
- **Key asset is the Pilot oilfield has a substantial audited reserve: 79 MMbbl 2P (proven & probable)**
  - Pilot field is well appraised and development ready, project NPV_{10} \$640m at \$60/bbl, NPV_{10} breakeven of c. \$39/bbl, based on a low salinity polymer flood, using an FPSO & two WHPs
  - 78 MMbbl of contingent resources in Elke, Narwhal & Blakeney with an NPV_{10} at \$60/bbl of \$458m
- **Low risk exploration on licensed acreage**
  - Bowhead prospect, a Pilot lookalike, 43 MMbbl with appraisal style risks (49% geological chance of success)
- **Farm-out and development alliances will be pursued**



Overview of Crondall

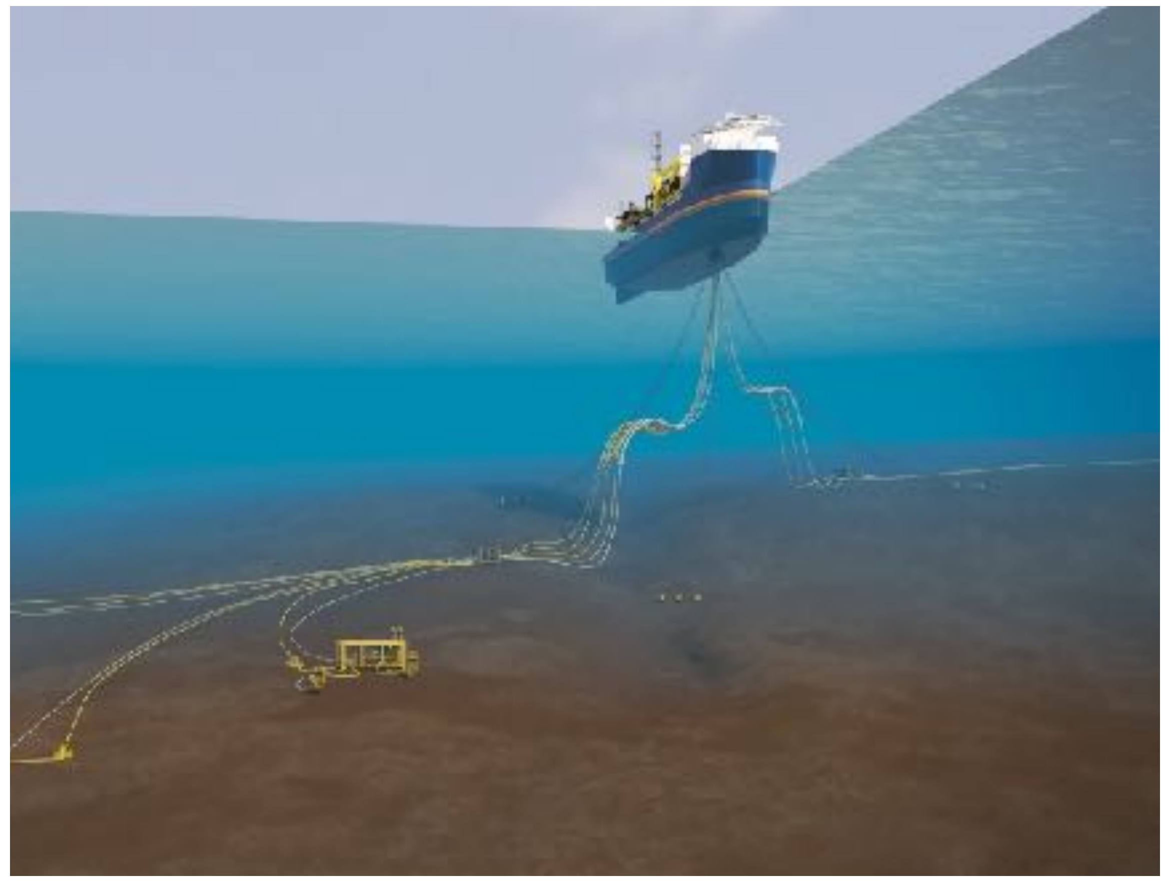
An independent oil and gas consultancy – with a niche focus on floating production and subsea developments.

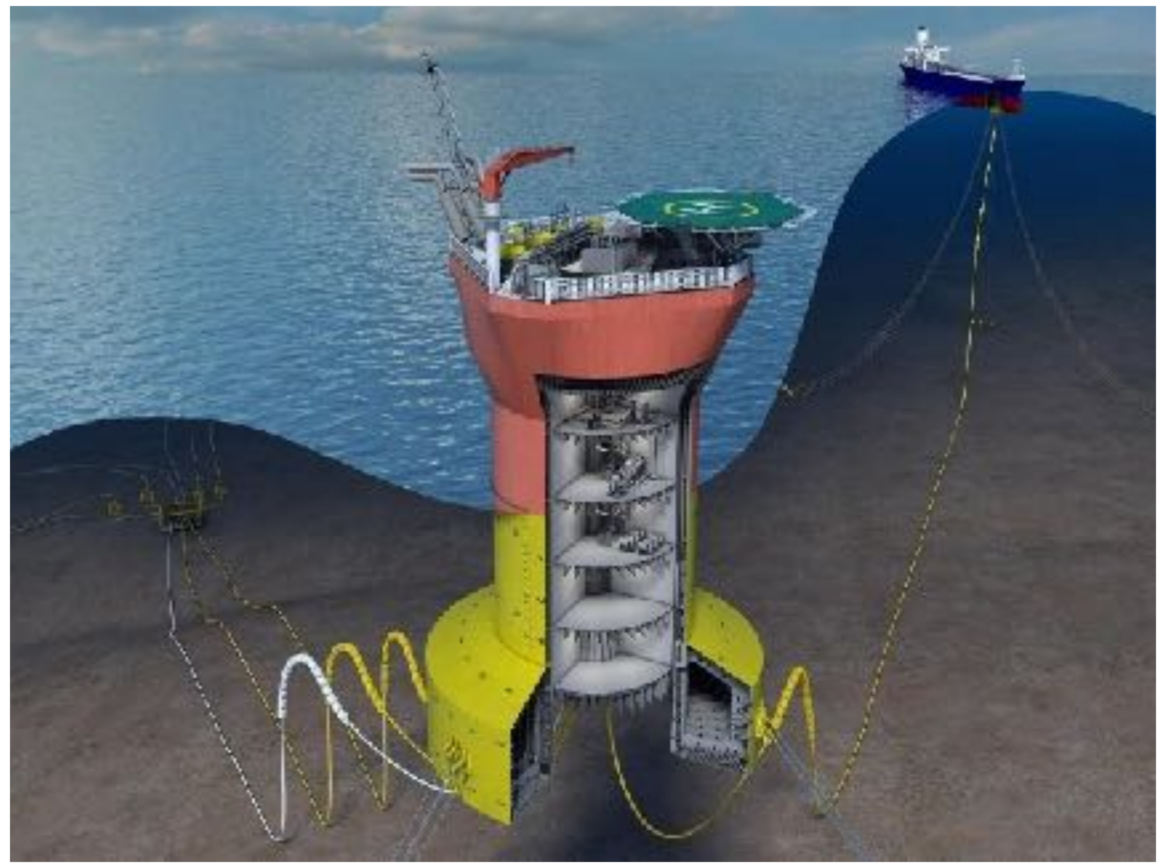
Engineering consultancy with full range of relevant disciplines including process facilities, E&I, marine technology, subsea and pipelines.

An established reputation for full project life cycle engineering support and technical and commercial advisory services.

Long term client relationships with oil companies and the investment & professional services communities.

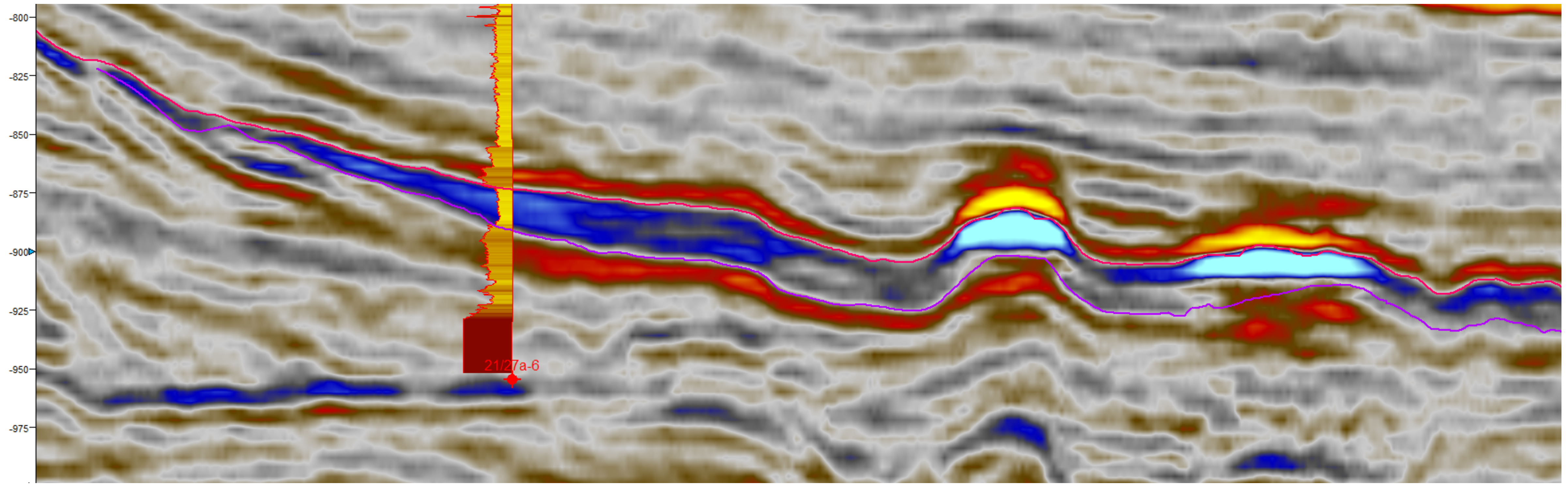
Technology focus on the use of remote control, automation and data analytics for un-manned floating facilities.

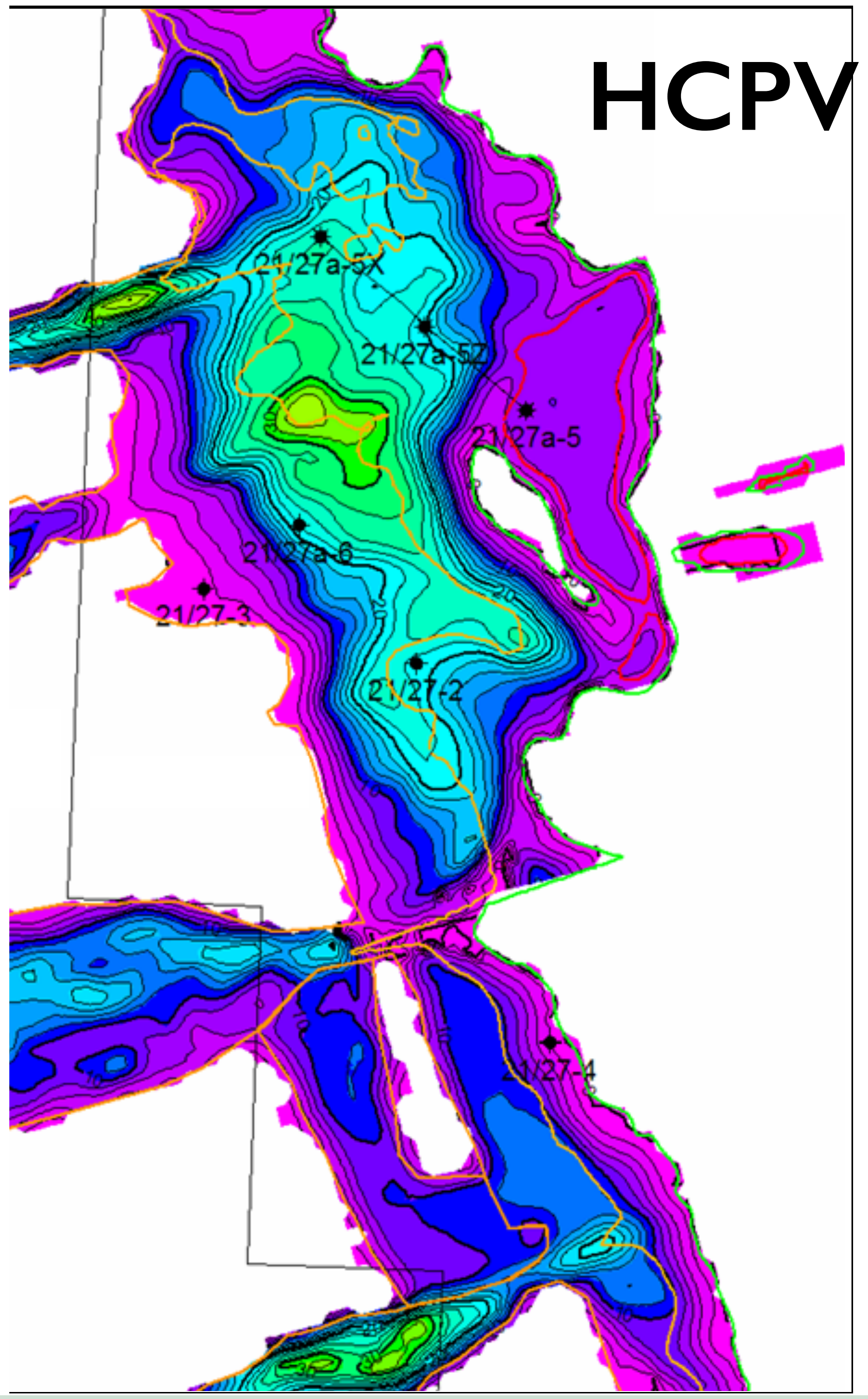


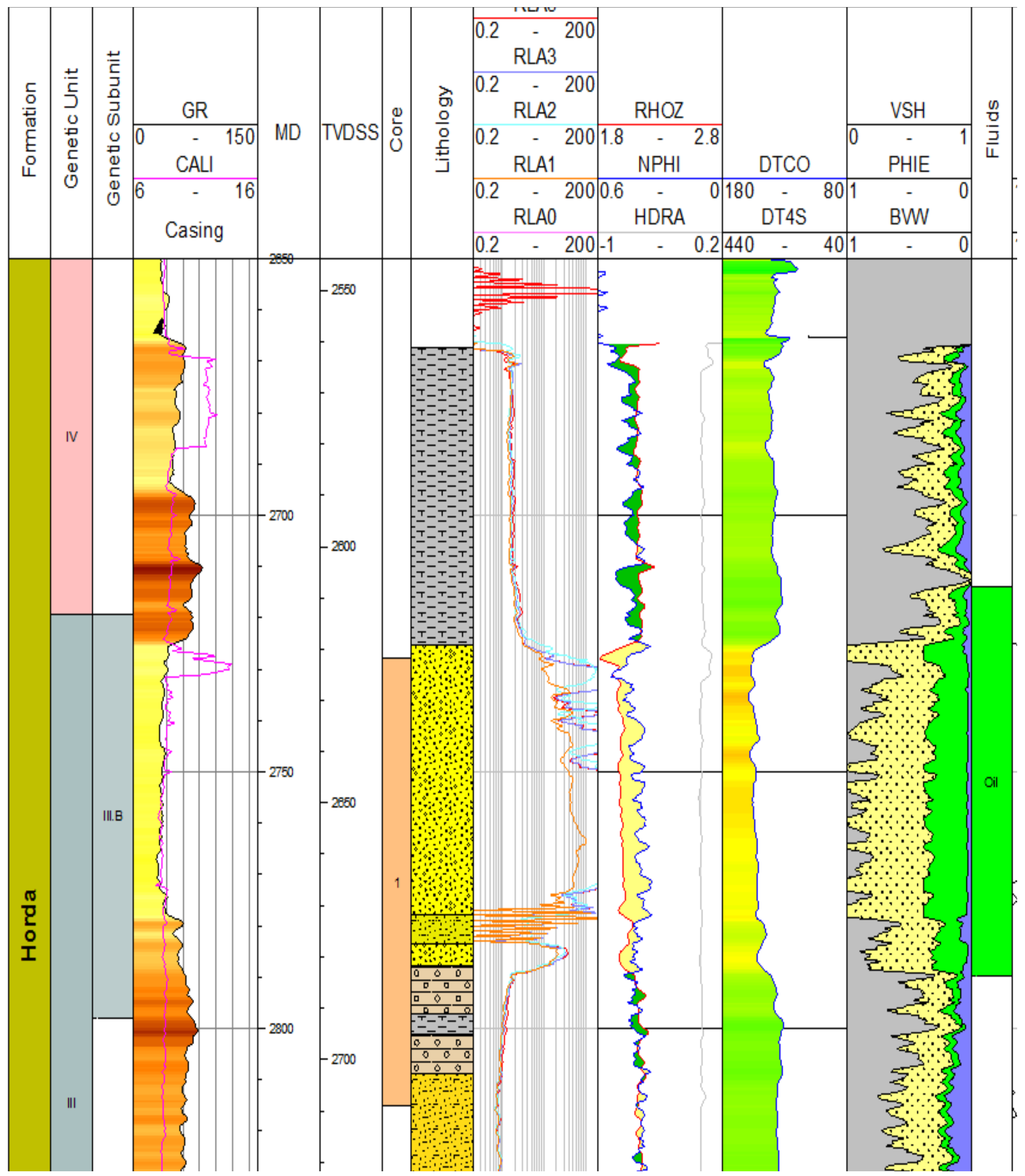


Pilot field summary

- Fully appraised, seven reservoir penetrations, three tested wells, core and fluid samples held by Orcadian, two high quality 3D seismic surveys
- Very high quality sandstone turbidite reservoir, 34% porosity, 2 to 10 darcies of permeability
- Significant oil in place: 263 MMbbls; audited 2P reserve of 79 MMbbls, based on a low salinity polymer flood of the reservoir
- Variable quality oil from 12° to 17° API, 160 cP to 1,200 cP
- Shallow water (c. 80m), 140 kms due East from Aberdeen, c. 40 kms from Gannet et al

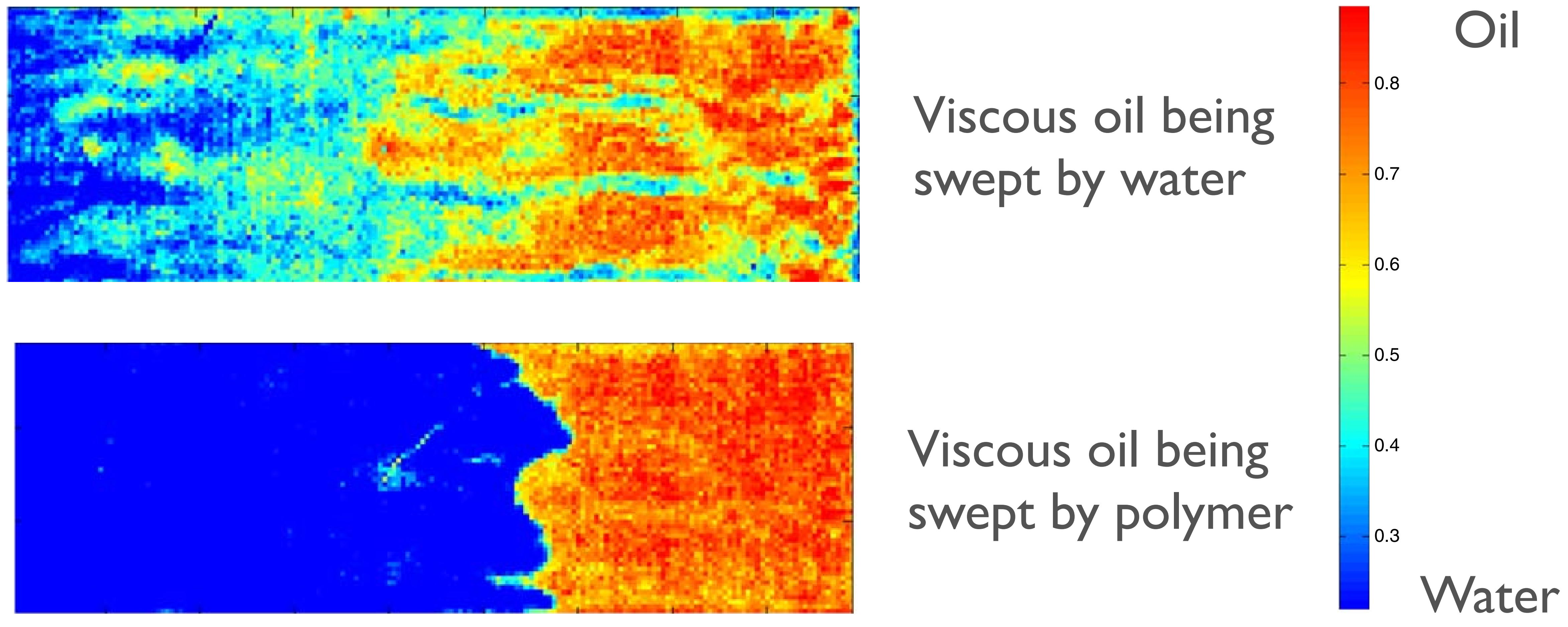


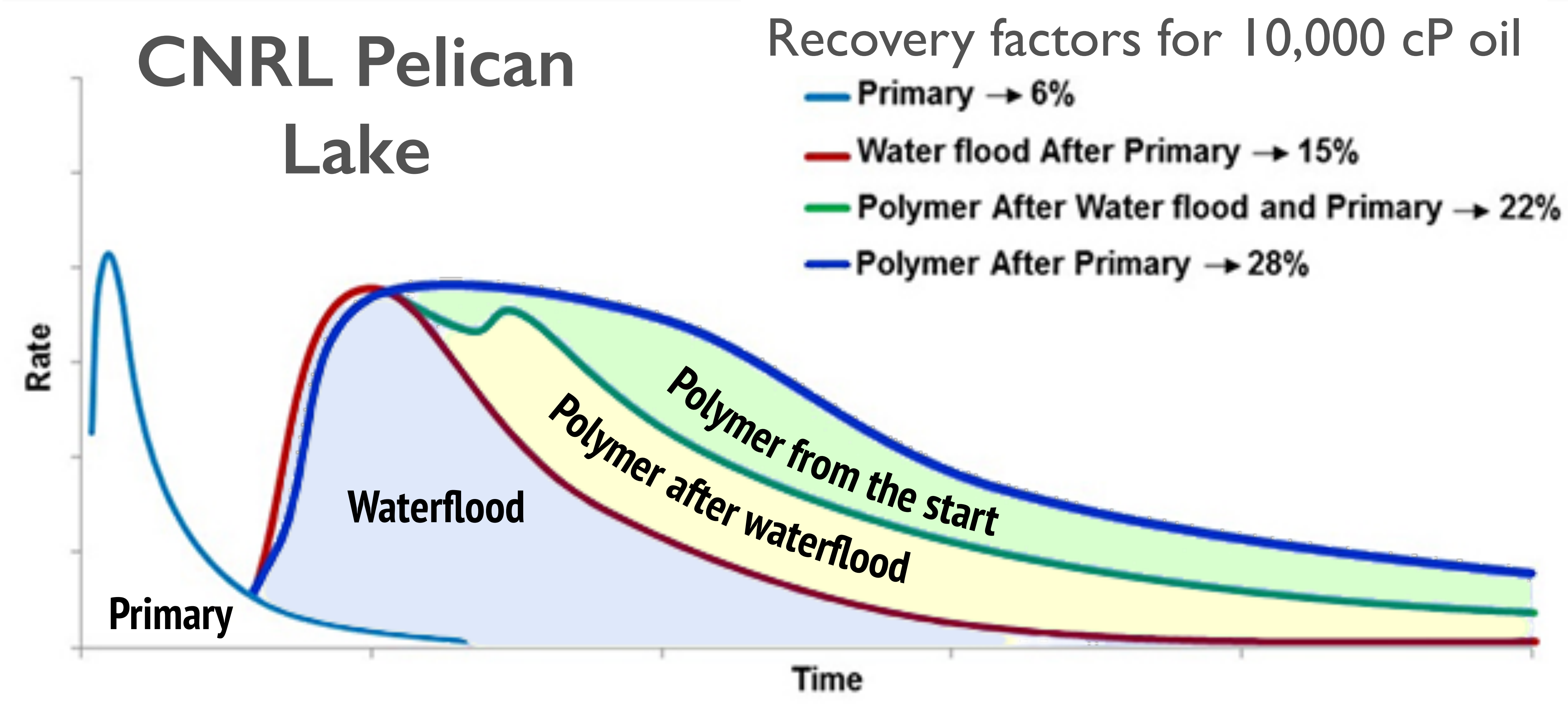




Polymer flooding – a proven technique

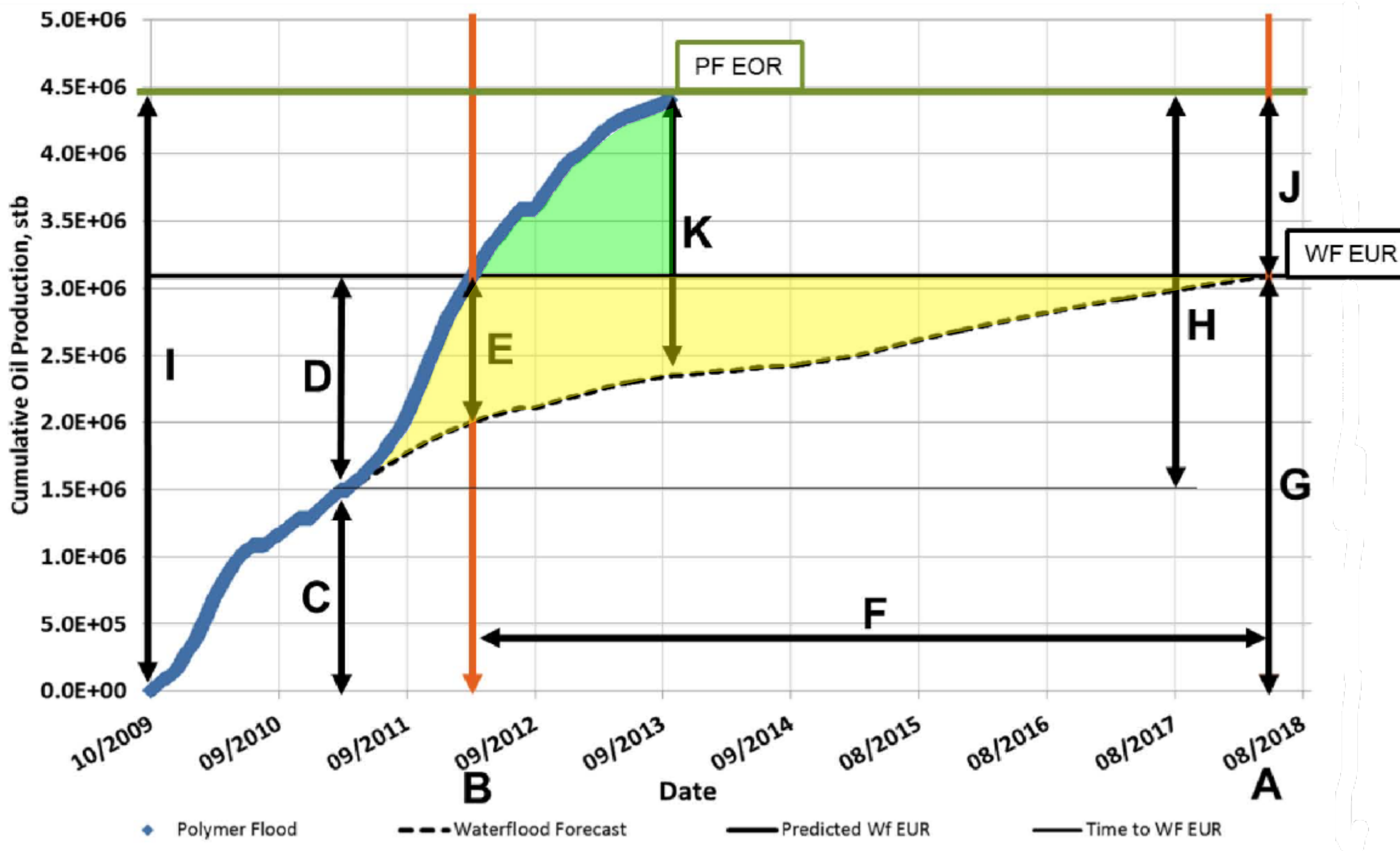
- Polymer flooding proven to deliver positive results with oil viscosities up to c. 5,000 cP
- Proven offshore on Captain field in the Central North Sea by Chevron
  - Ithaca has recently approved Stage 2 of the project
- Well spacing optimisation is key; better when applied early in field life, see Pelican Lake field
- Offshore polymer floods use an emulsion based polymer which simplifies logistics and operations
  - >99% uptime on Captain
- Low salinity water injection can massively reduce polymer costs



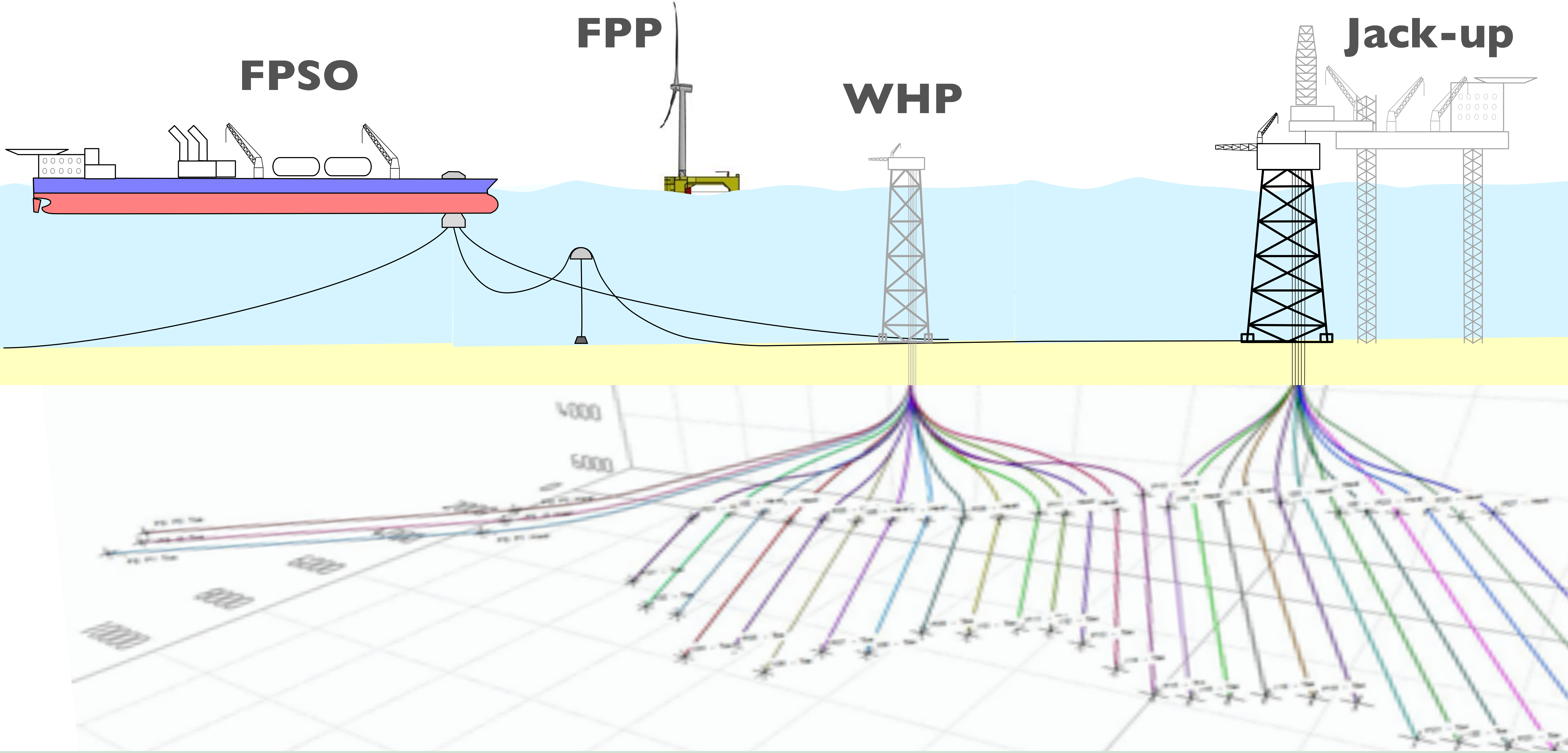


Polymer flooding – Captain field

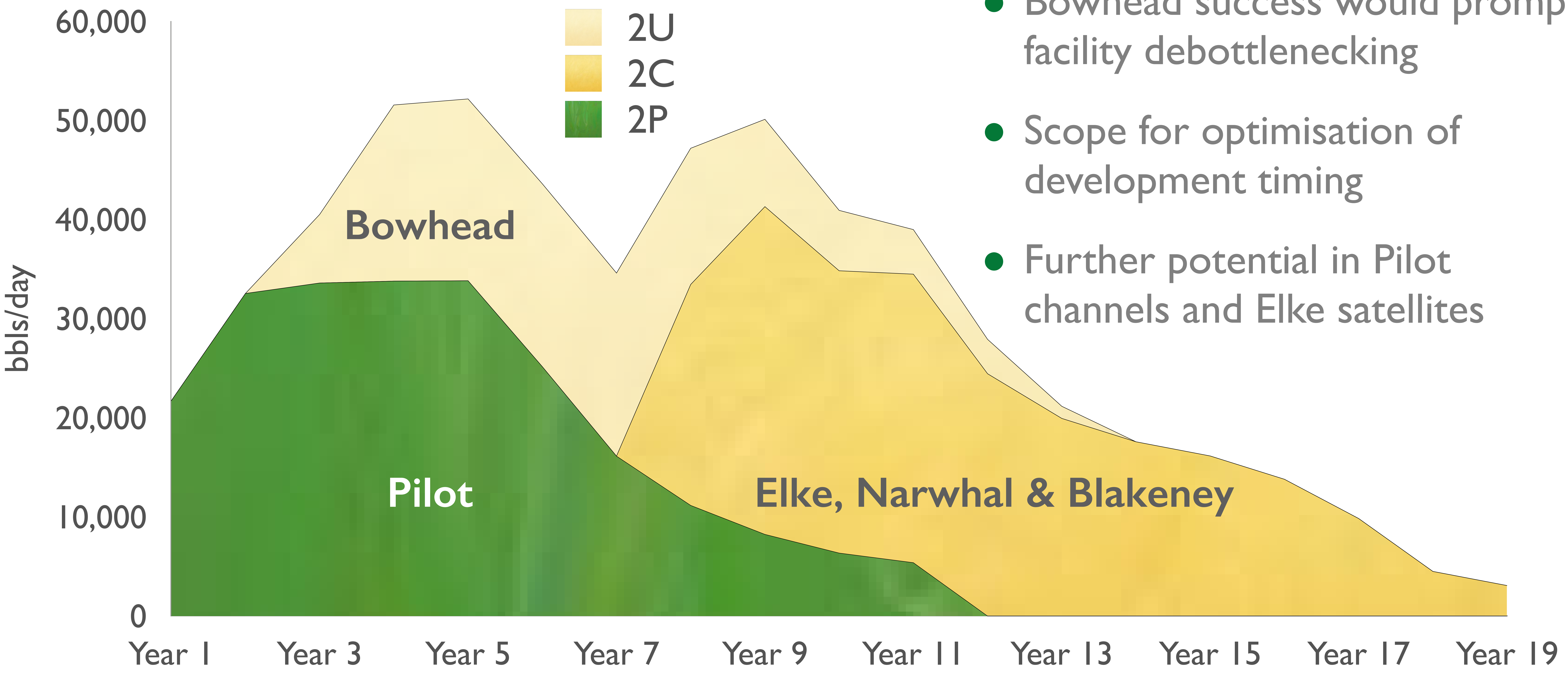
- Completed in 2013, focused on a well pair in the Southern Upper Captain sand, separated by ≈125m
- Dramatic acceleration of waterflood reserves
- Significant increment to expected waterflood recovery (16%)
- Excellent analogue to Pilot, much to learn and copy



Pilot field development plan



Potential area production



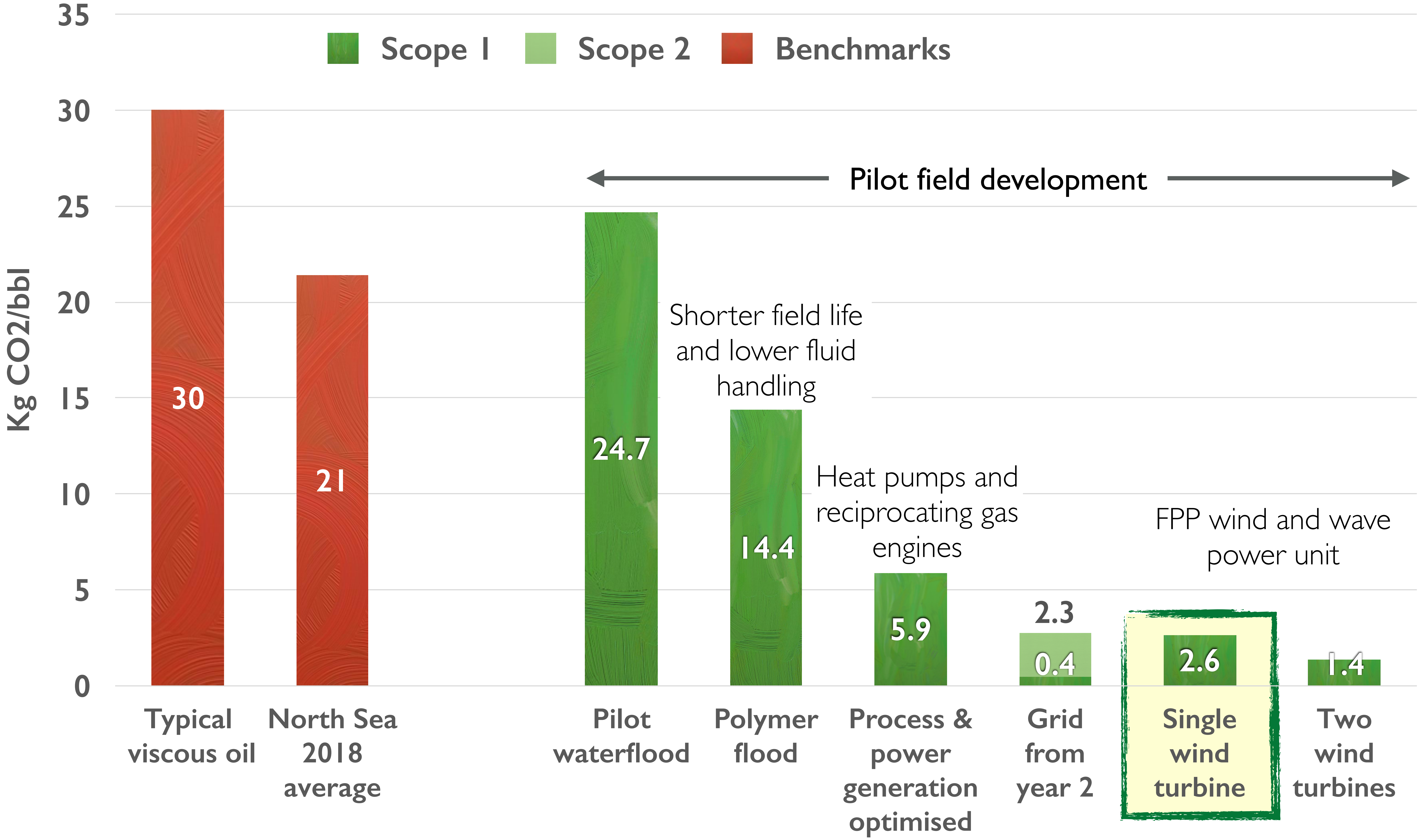
- Bowhead success would prompt facility debottlenecking
- Scope for optimisation of development timing
- Further potential in Pilot channels and Elke satellites

Production profiles for Pilot, Elke, Narwhal & Blakeney as estimated by Sproule for the purposes of the CPR. Bowhead profile based on a Pilot profile scaled to match Bowhead resources.

A project delivering on the Government's Net Zero agenda

ORCADIAN ENERGY

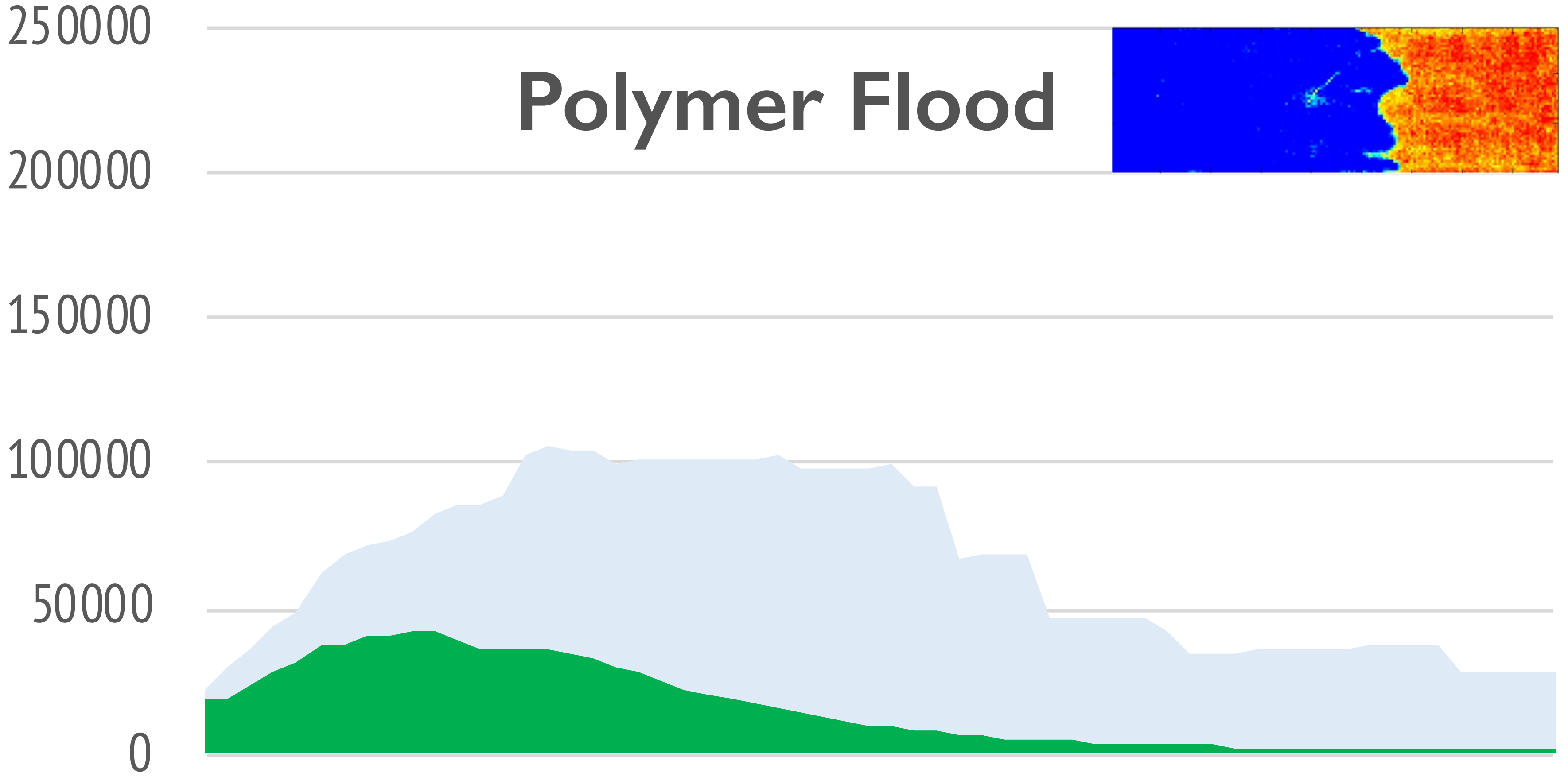
- Many opportunities to reduce emissions identified
- Integration of aggressive process heat management with high efficiency back-up power generation and electrification has the potential to drive emissions down by over 80%
- Local wind farm power, with highly efficient back-up gas engines, reduces emissions as low as connection to a future grid with half of today's CO_2 intensity

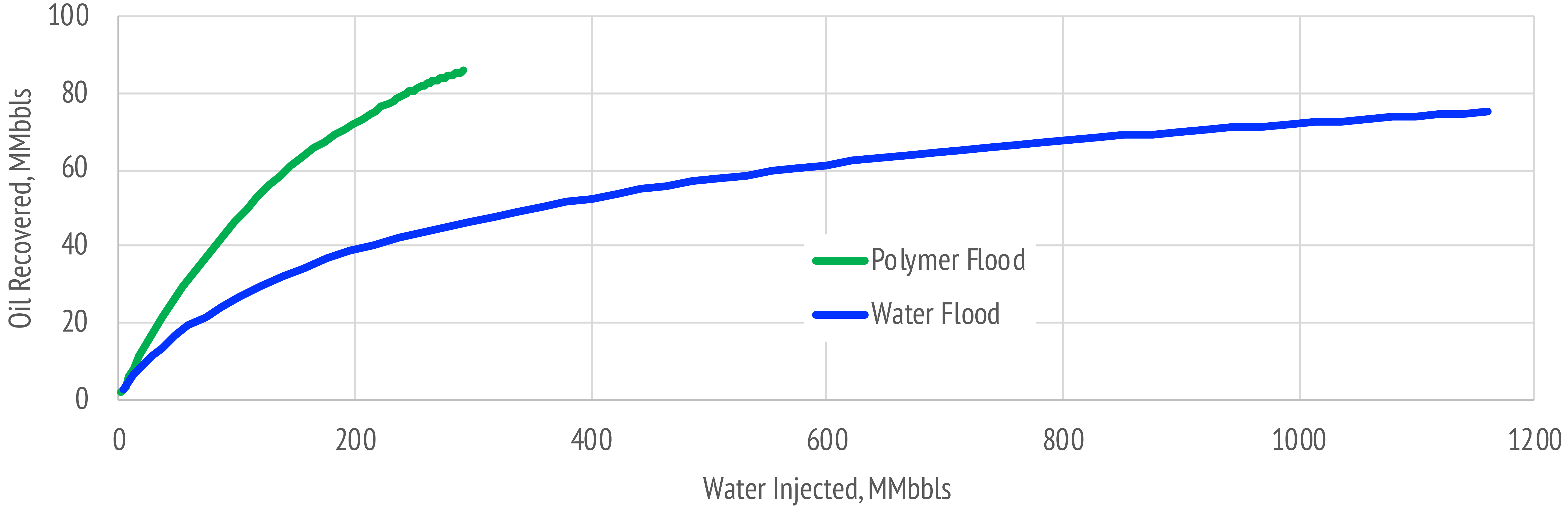


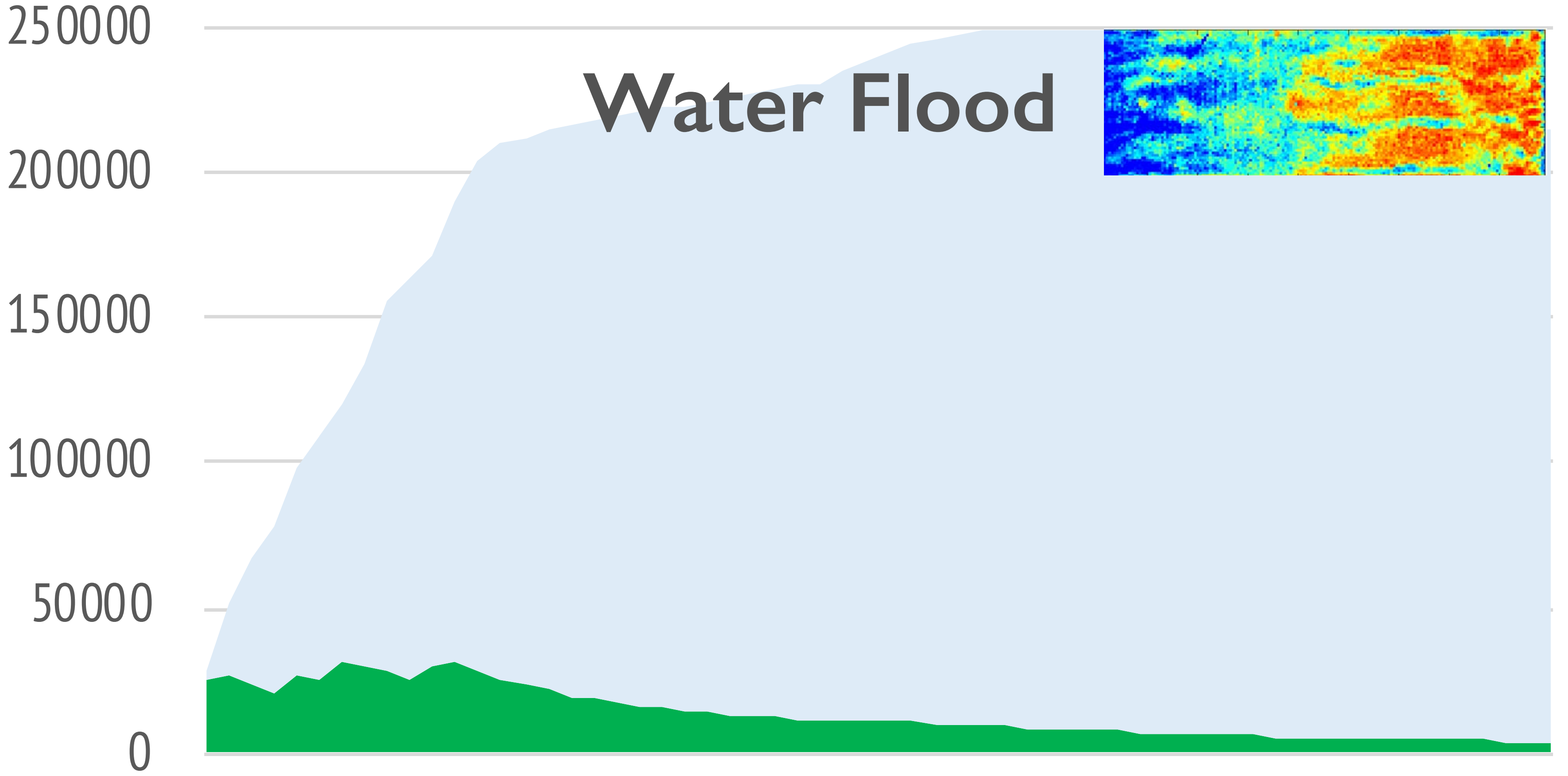
Estimates from recently submitted CSR Addendum prepared with Crondall Energy. These numbers are CO_2e

Why polymer reduces CO_2

ORCADIAN ENERGY





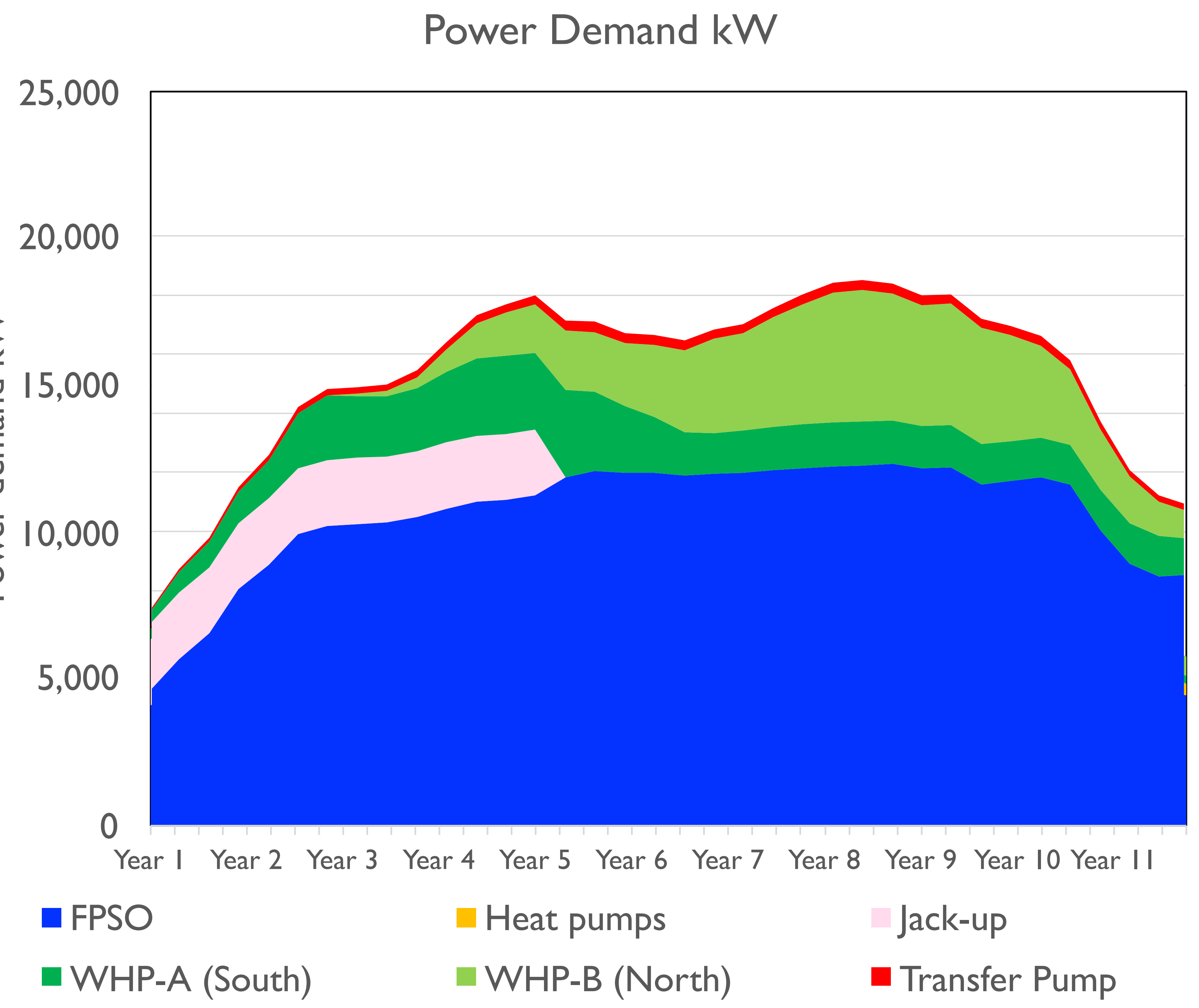


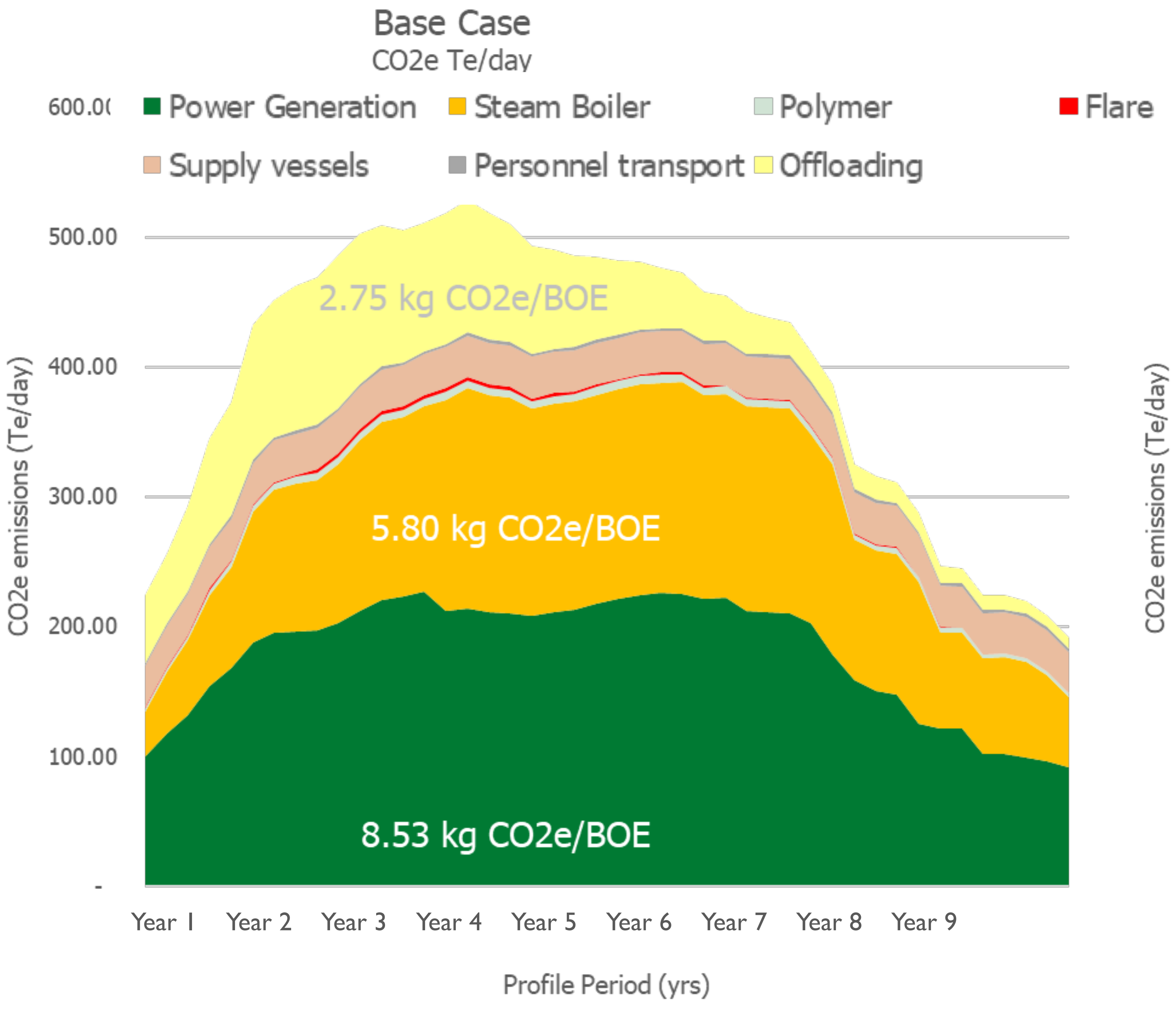
- Fluid handling requirements massively reduced by using polymer
- Field life significantly shortened with polymer
- Pumping wells and injecting fluid are the key drivers of CO_2 emissions
- Polymer boosts recovery so there are more barrels produced in less time and for much less energy
- Polymer use significantly enhances project economics while minimising environmental impacts

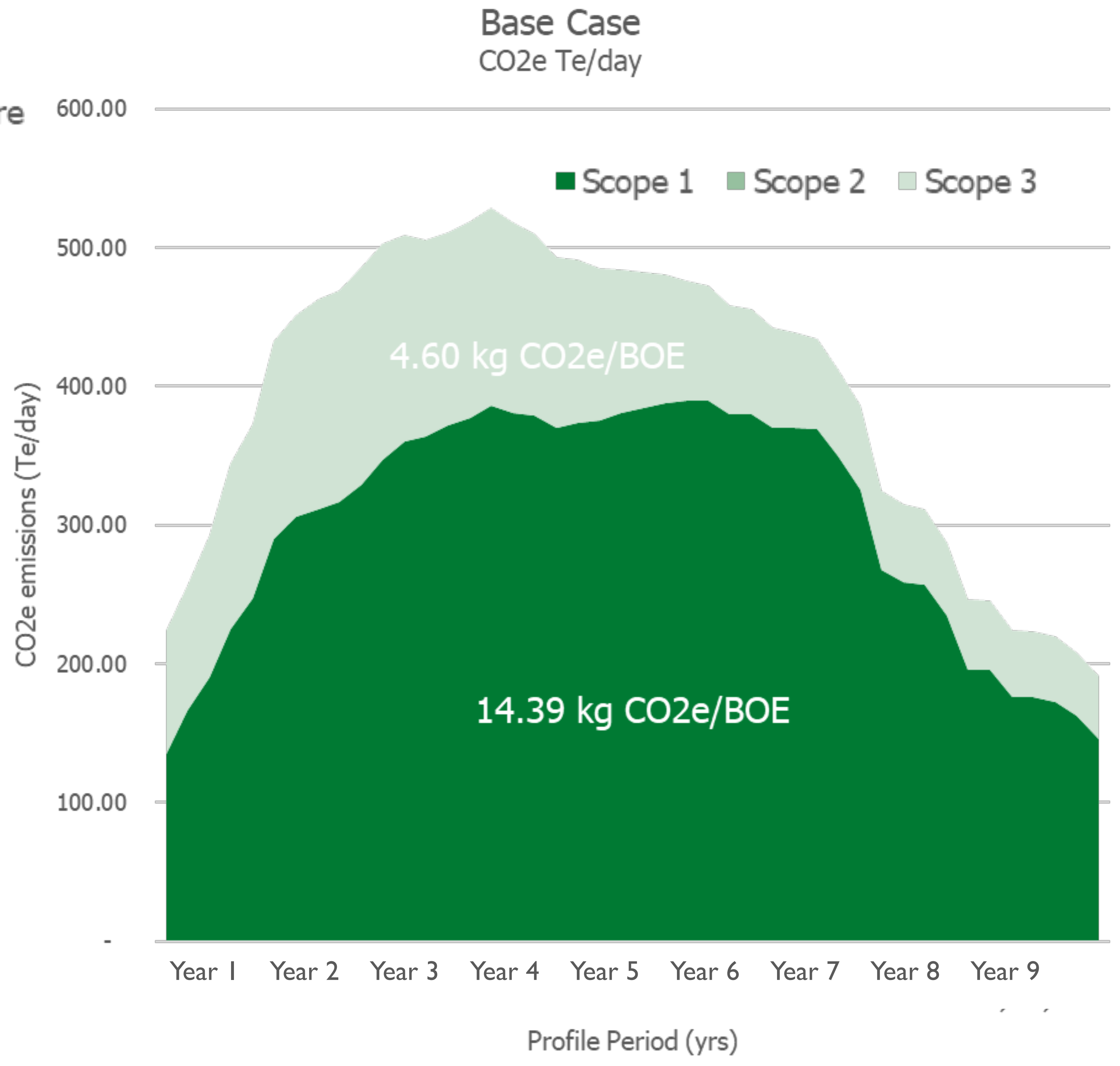
Production profiles for polymer flood and water flood from Orcadian Energy reservoir simulations; plot of recoverable oil vs. water injected based upon the same simulations.

Emissions, by cause and scope
CSR initial polymer scenario

ORCADIAN ENERGY







- Base case from September 2020 CSR submission, focus had been on quantifying rather than driving down emissions (included some worst case assumptions e.g. downhole pump power demands)
- Adoption of polymer flood had reduced both fluid handling and field life

OGA Stewardship Requirements - Estimating, Measuring & Analysing GHG emissions

Operators need to be able to estimate and analyse emissions for ongoing operations, and new projects. Driven by regulatory compliance (e.g. UK OGA), investor and more general stakeholder expectations.

- OGA (UK) Stewardship Expectation 11 - Net Zero (March 2021)

"…Industry should go considerably faster and farther in reducing their own carbon footprint, or risk losing their social licence to operate"

- Emphasis on:
  - Measuring, reporting and tracking of GHG emissions.
  - From the exploration and appraisal phase – starting with the licence application and strategies for minimising GHG emissions.
  - Through development, production and decommissioning strategies – gas recovery/energy hubs/measurement, power generation and flaring and venting reduction.
  - Demonstrating delivery
    - Annual UKCS Stewardship survey
    - Performance benchmarking
    - OGA consent and authorisation processes.

Supporting our clients through the Energy Transition

Net zero roadmap
(Brownfield & Greenfield)

- Strategies for emission reduction measures over project lifecycle:
  - Current technologies.
  - Future technologies.
  - Renewable infrastructure growth.

Low GHG facilities design
(Brownfield & Greenfield)

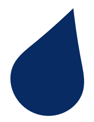
- Design studies into use of technology, configuration & operational approaches to reduce development GHG.
- Support with Regulatory Authorities (e.g. OGA in UK).

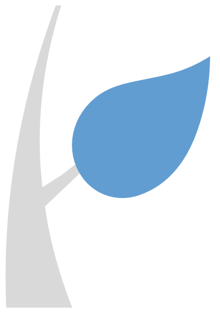
Emissions benchmarking for reporting & design
(Brownfield & Greenfield)

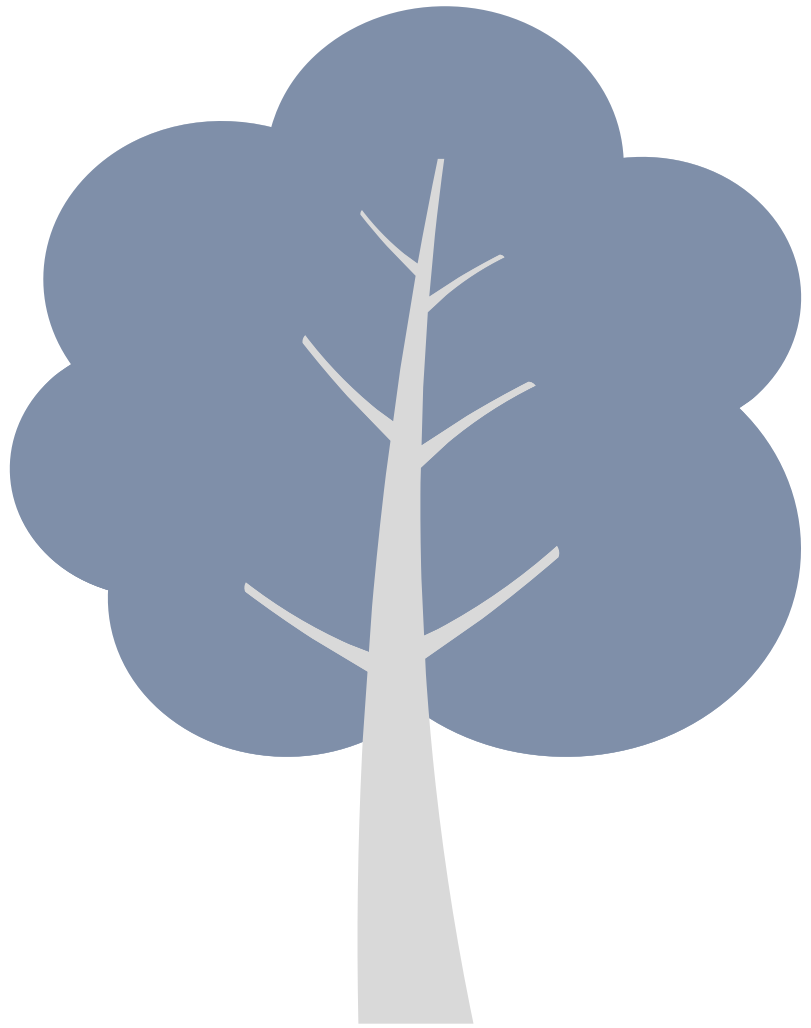
- Benchmarking against existing facilities.
- Benchmarking design development options.

Analysing development emissions
(Brownfield & Greenfield)

- GHG emissions analysis from construction through operations.
- Performed at any stage of facility lifecycle.







Estimating & Analysing GHG emissions – How?

Crondall has developed a tool to estimate and benchmark Scope 1, 2 & 3 greenhouse gas emissions for offshore developments - Zero Emissions Tracking and Assessment (ZETA) tool.

Supporting Operators to provide practical solutions to reduce brownfield emissions and develop implementation strategies

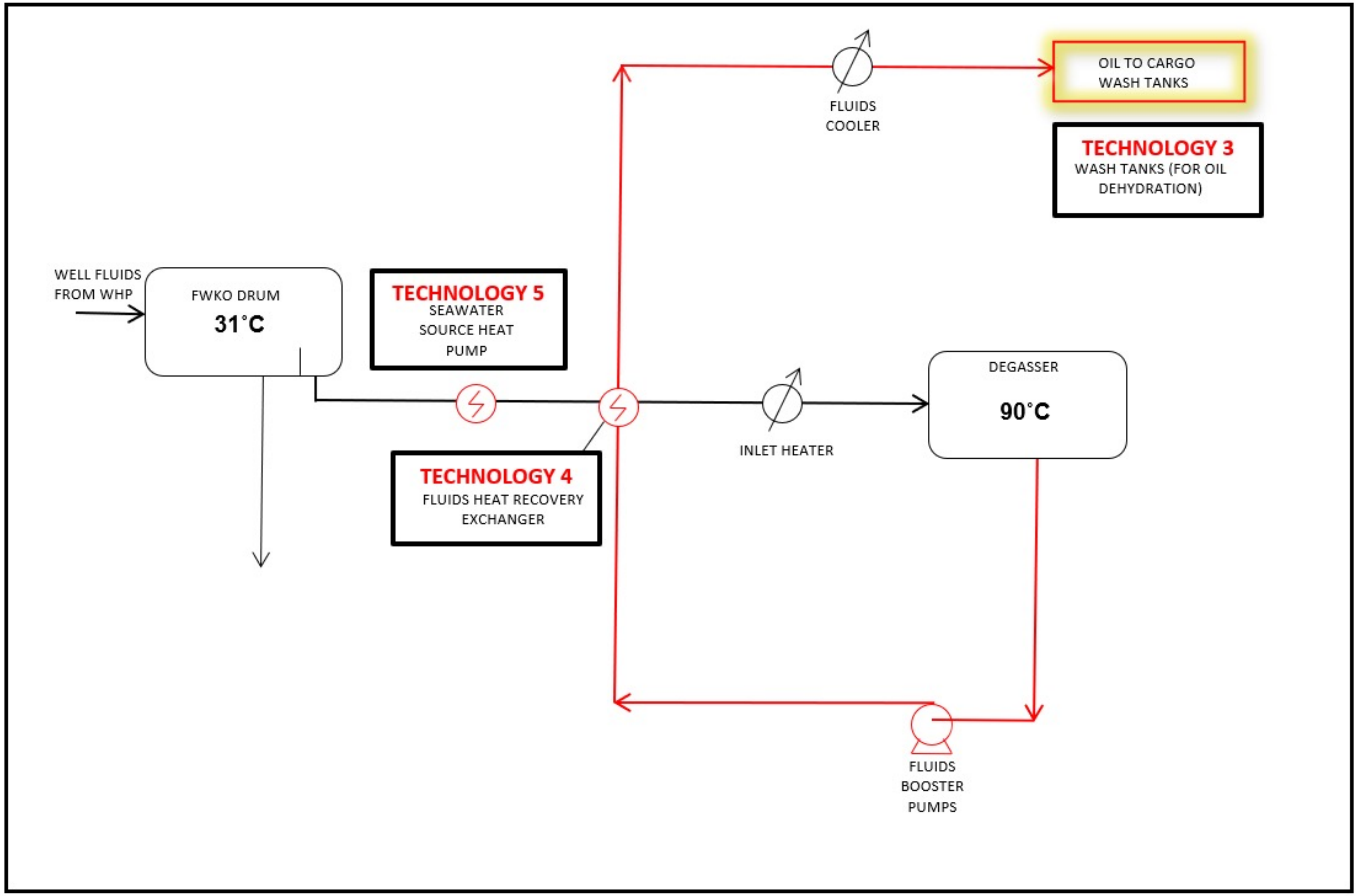
- Utilise ZETA tool to identify existing emission "bad actors" and guide technology and system design process.
- Leverage Crondall's experience of technology, alternative system design, and understanding of operational constraints, to propose practical solutions to reduce emissions.
- Utilise ZETA tool to develop net zero roadmap for existing facilities, enabling assessment of staged deployment.
- Benchmark performance against industry data or other facilities.

Facilities technology and system design optimisation

Re-assessing the design of oil & gas facilities through the lens of CO_2 emissions reduction.

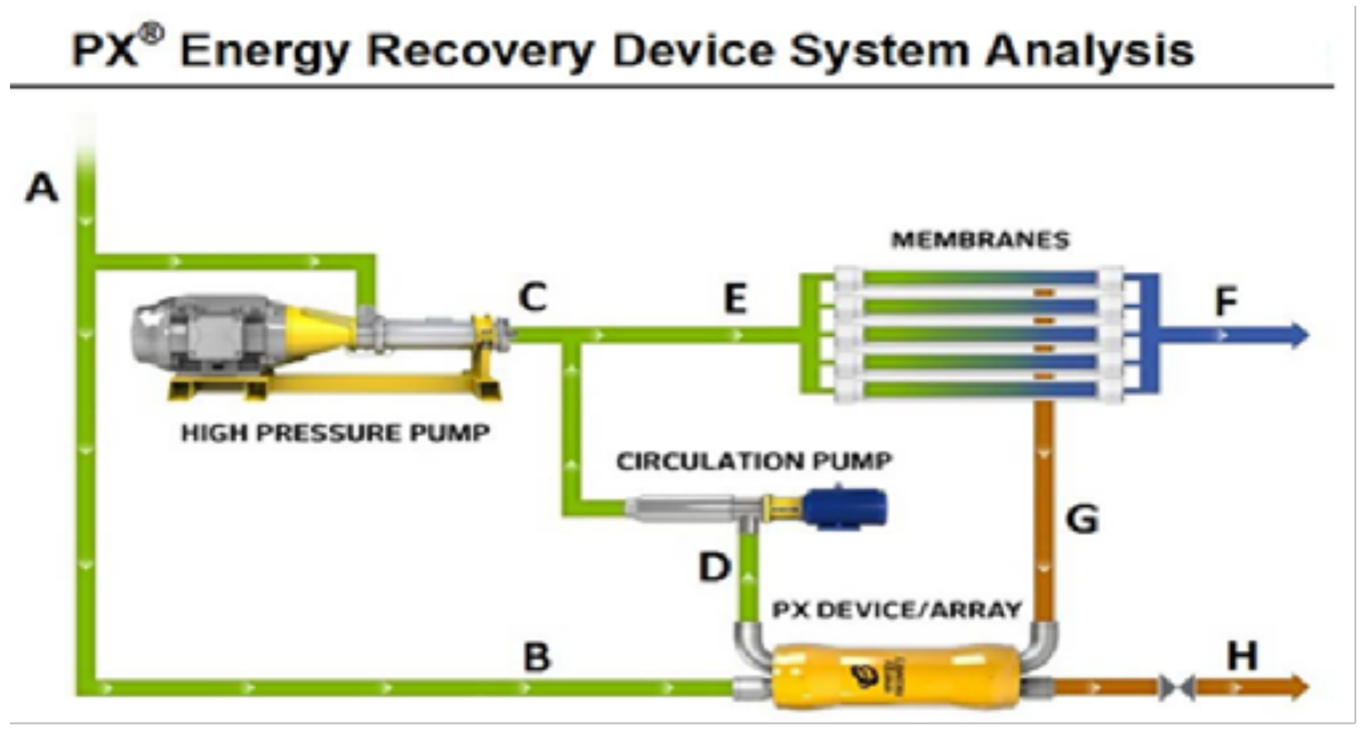
Electrification & Electrical Architecture				Energy use optimisation			Process technologies			Flaring	Carbon capture	
Generation efficiency	Alternative generation	Alternative distribution	Power import capability	Heat recovery optimisation	Heat pump optimisation	Smarter heating systems	Oil-water separation technology	Oil degassing technology	Compressor efficiency	Minimising flaring & venting	Compact, modularised technology	Energy integration management

Process optimisation

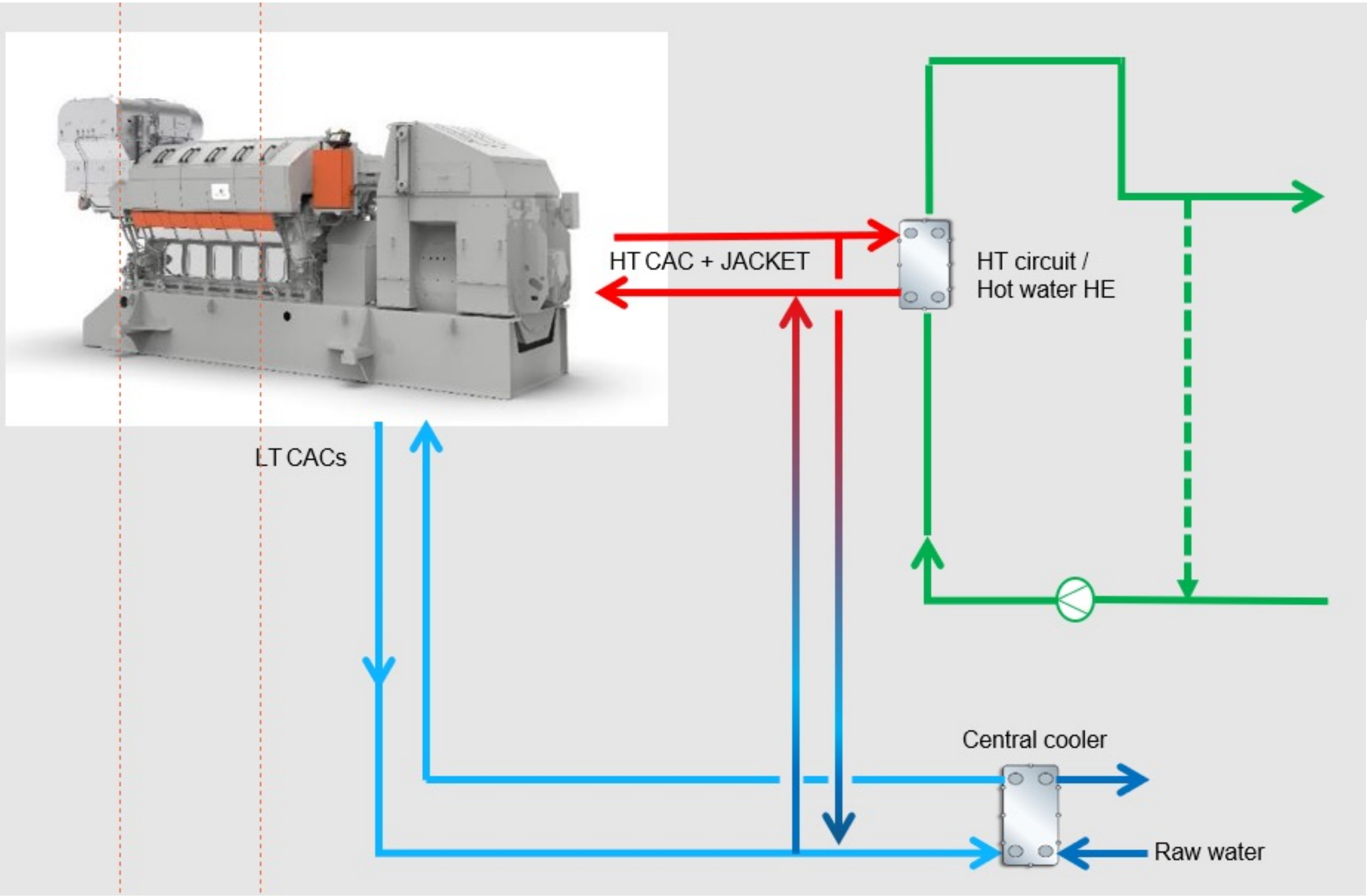


- Industrial heat pumps

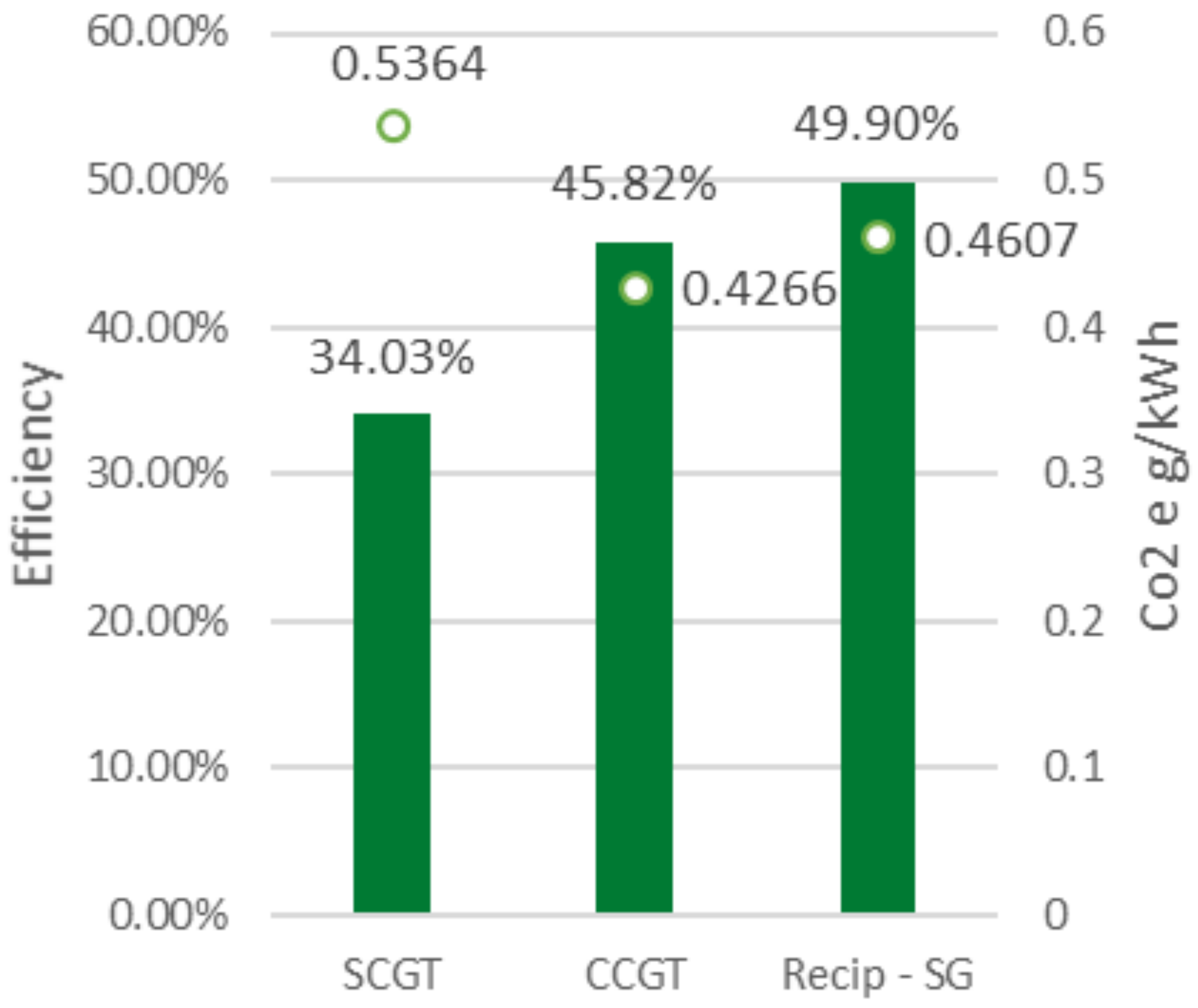
- Energy recovery systems



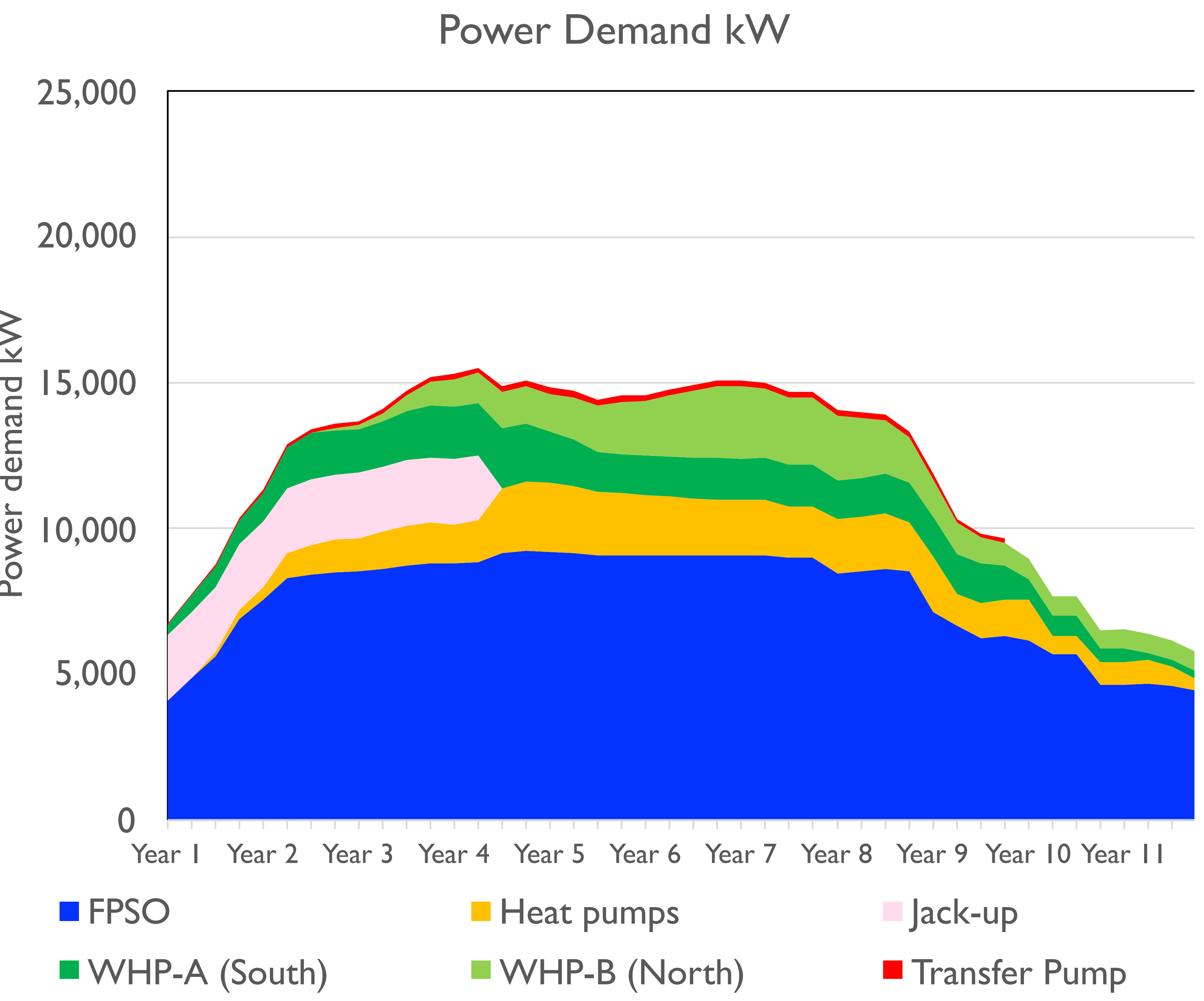
Power Generation

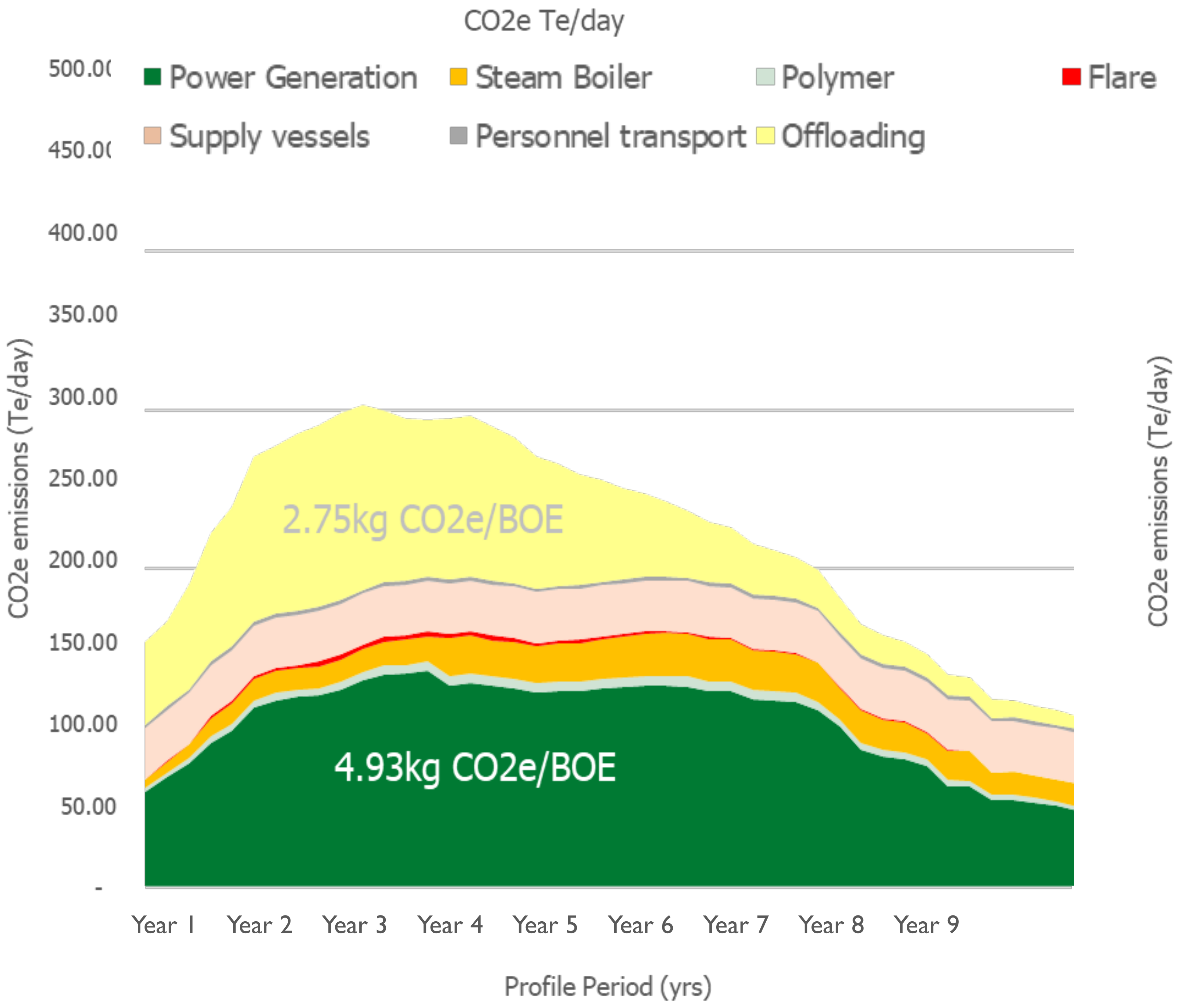


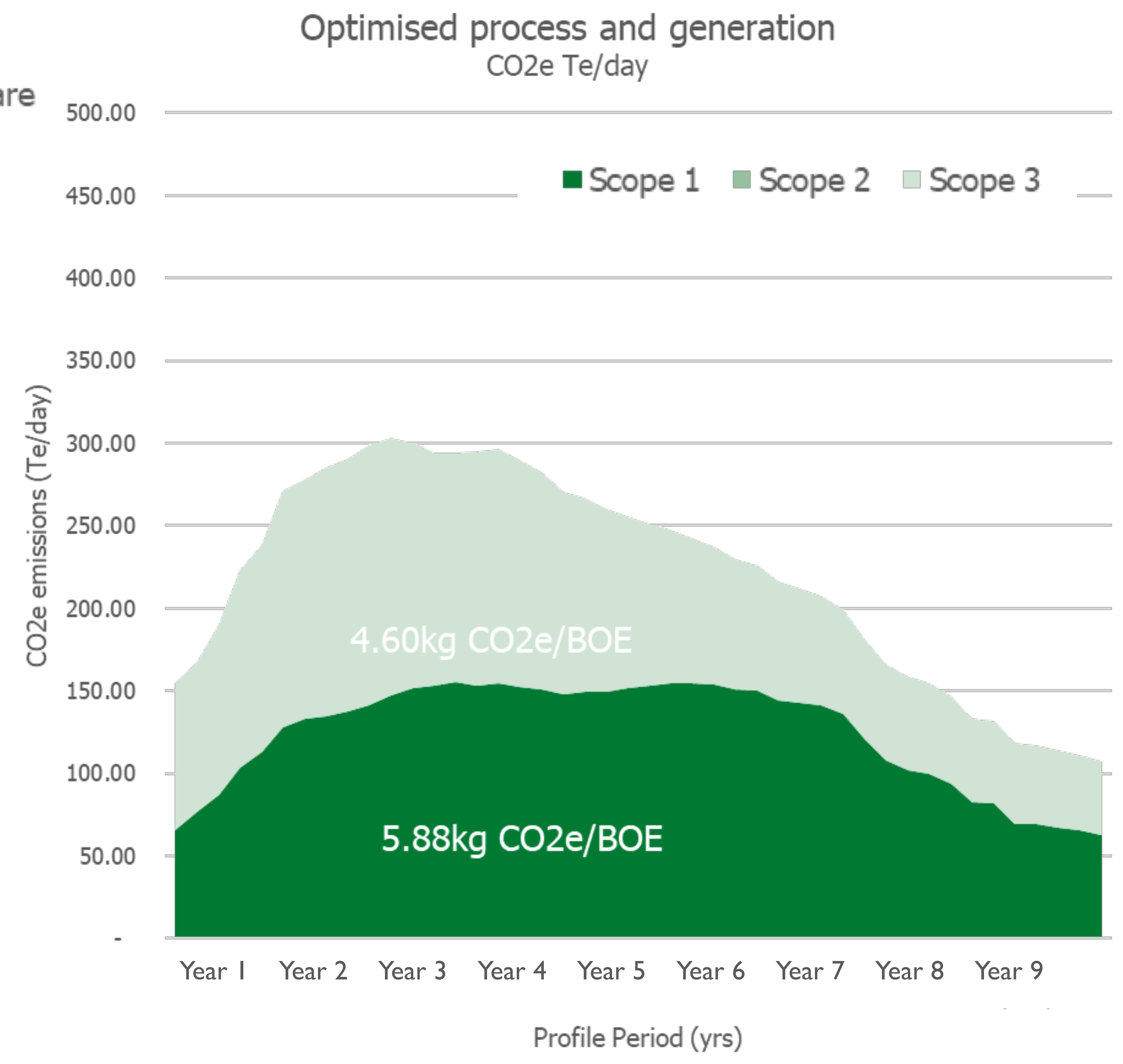
- Wartsila, dual fuel gas reciprocating engines
- "Smart heat recovery" system



Emissions, by cause and scope
Process optimisations and recips



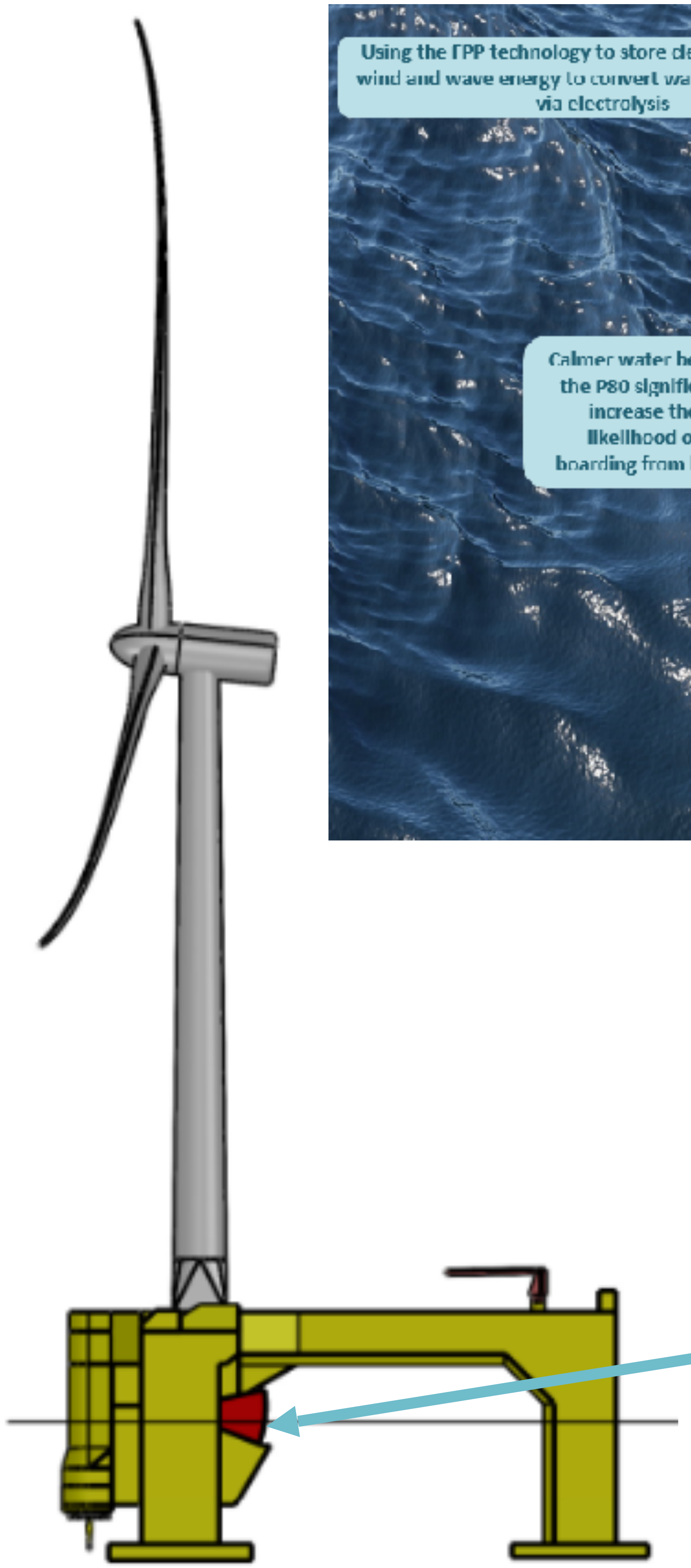


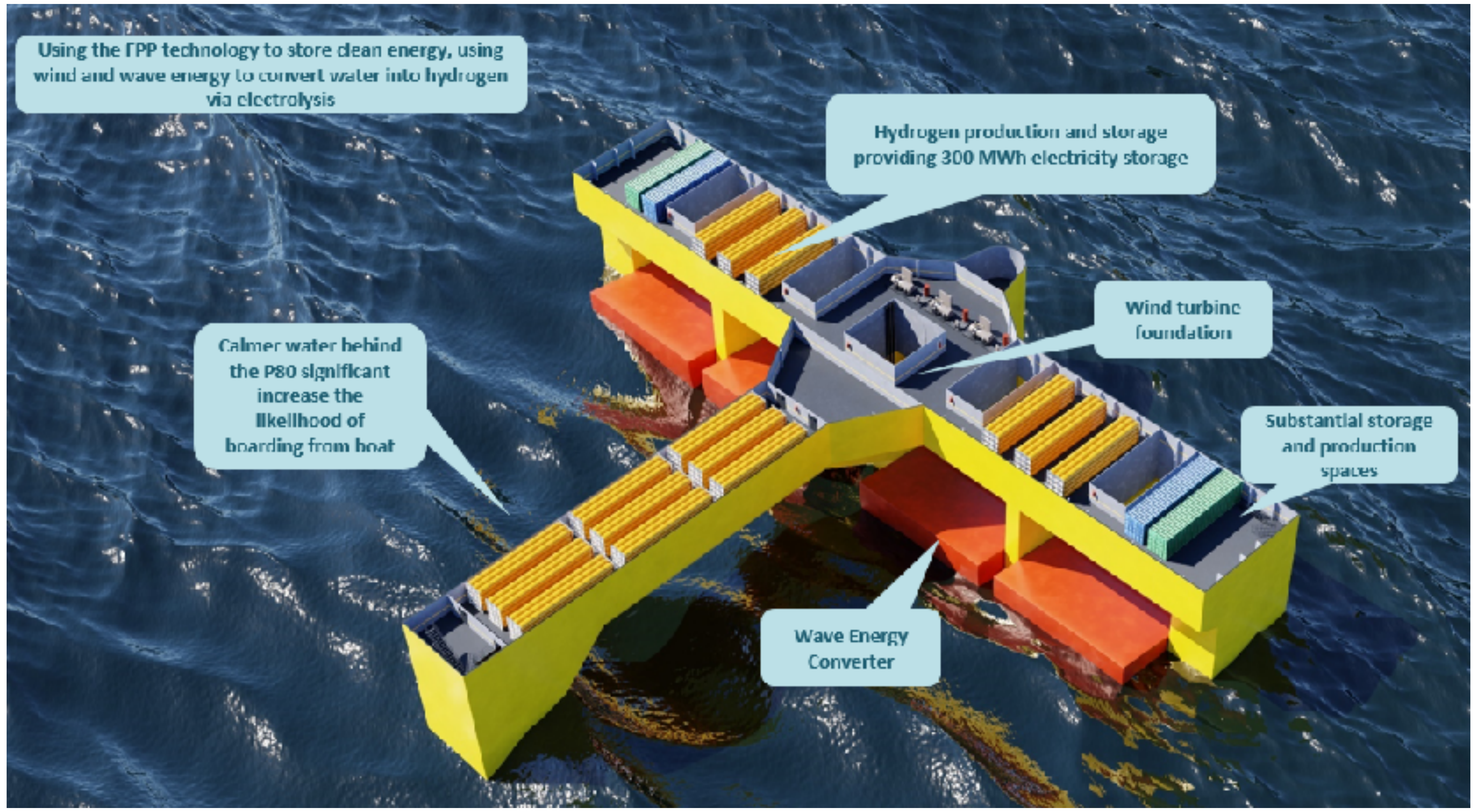


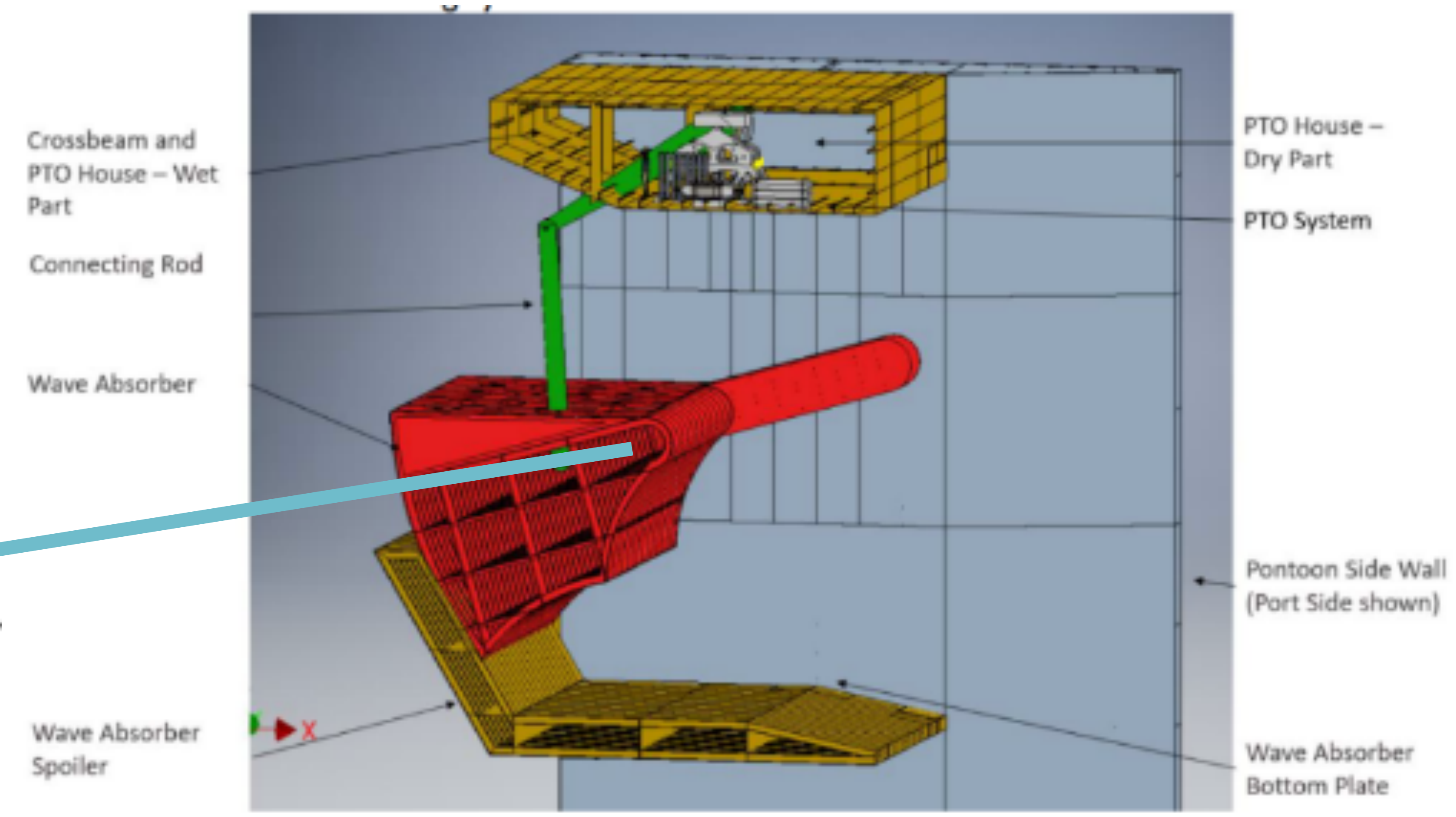
- Crondall reshaped process and power generation with the intention of driving down emissions
- The combination of heat pumps and high efficiency generation is the key to reducing emissions

SYSTEM OVERVIEW

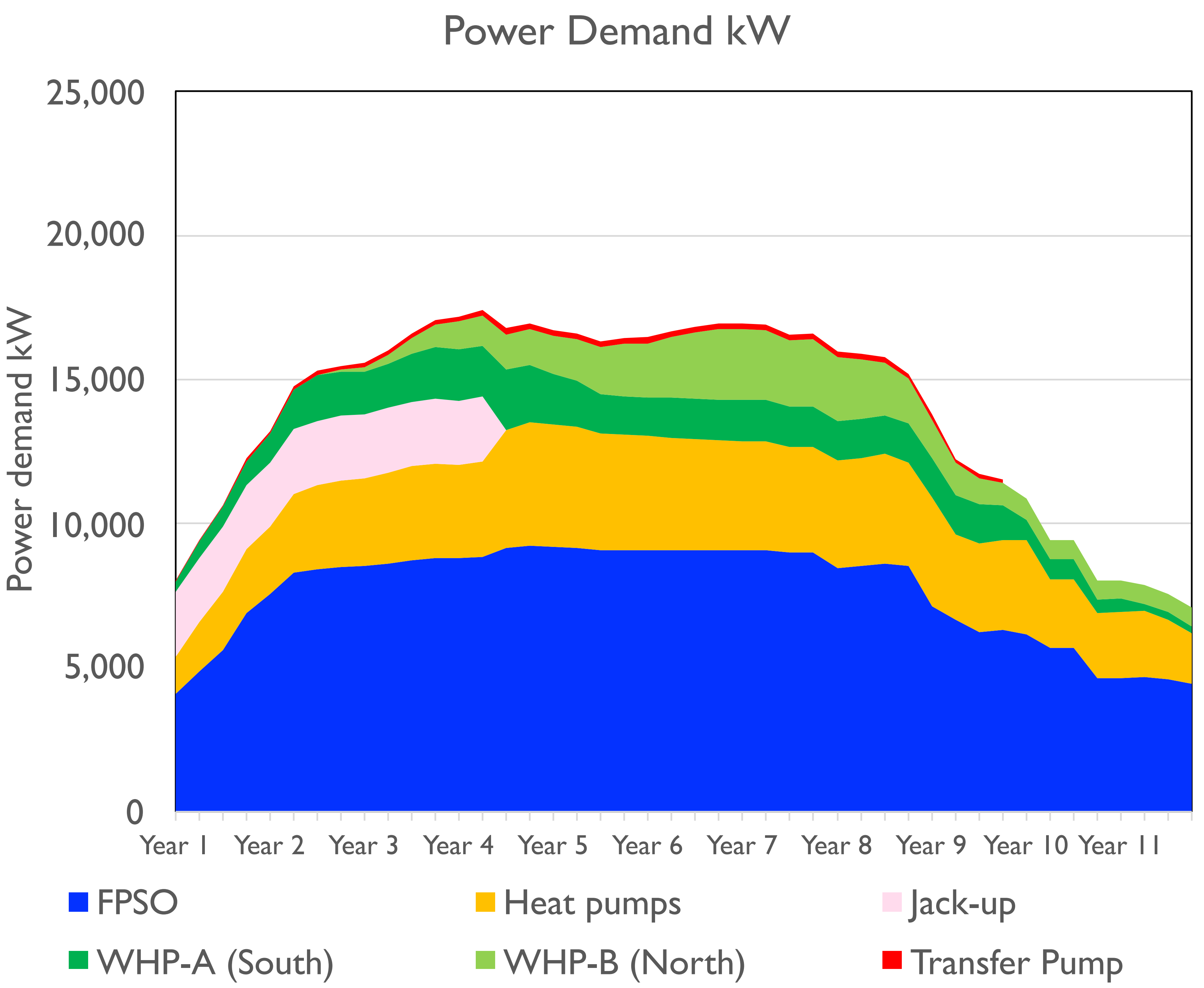
- **Platform**
  - North Sea design for 15m Hs sites
  - Panel based semi submersible
  - Makes use of harbour effect for transfer
  - Hydrogen energy storage can be accommodated
- **Turret Mooring System**
  - Vanes into wave direction
    - WTG yaws independently
  - Multi point catenary mooring system
  - Disconnectable if required
- **Wind Turbine Generator (WTG)**
  - Turbine agnostic
  - 12 to 15MW (to be assessed)
- **Wave Energy Convertor**
  - 4 off, from 500kW to 1MW each (to suit site)
  - Wave energy converted to motion by absorber
  - Mechanical motion converted to electricity via oil hydraulic Power Take Off (PTO) system

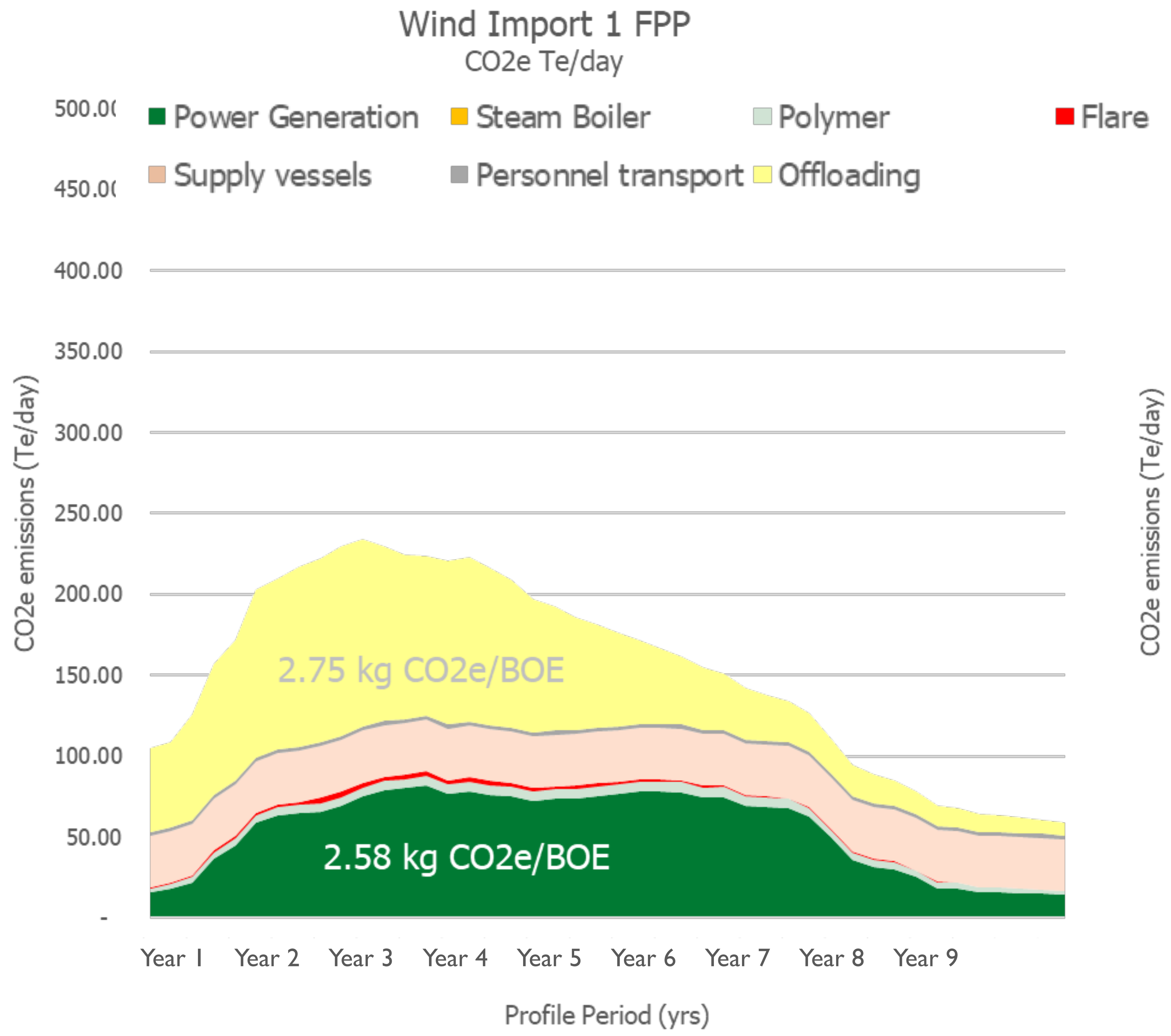


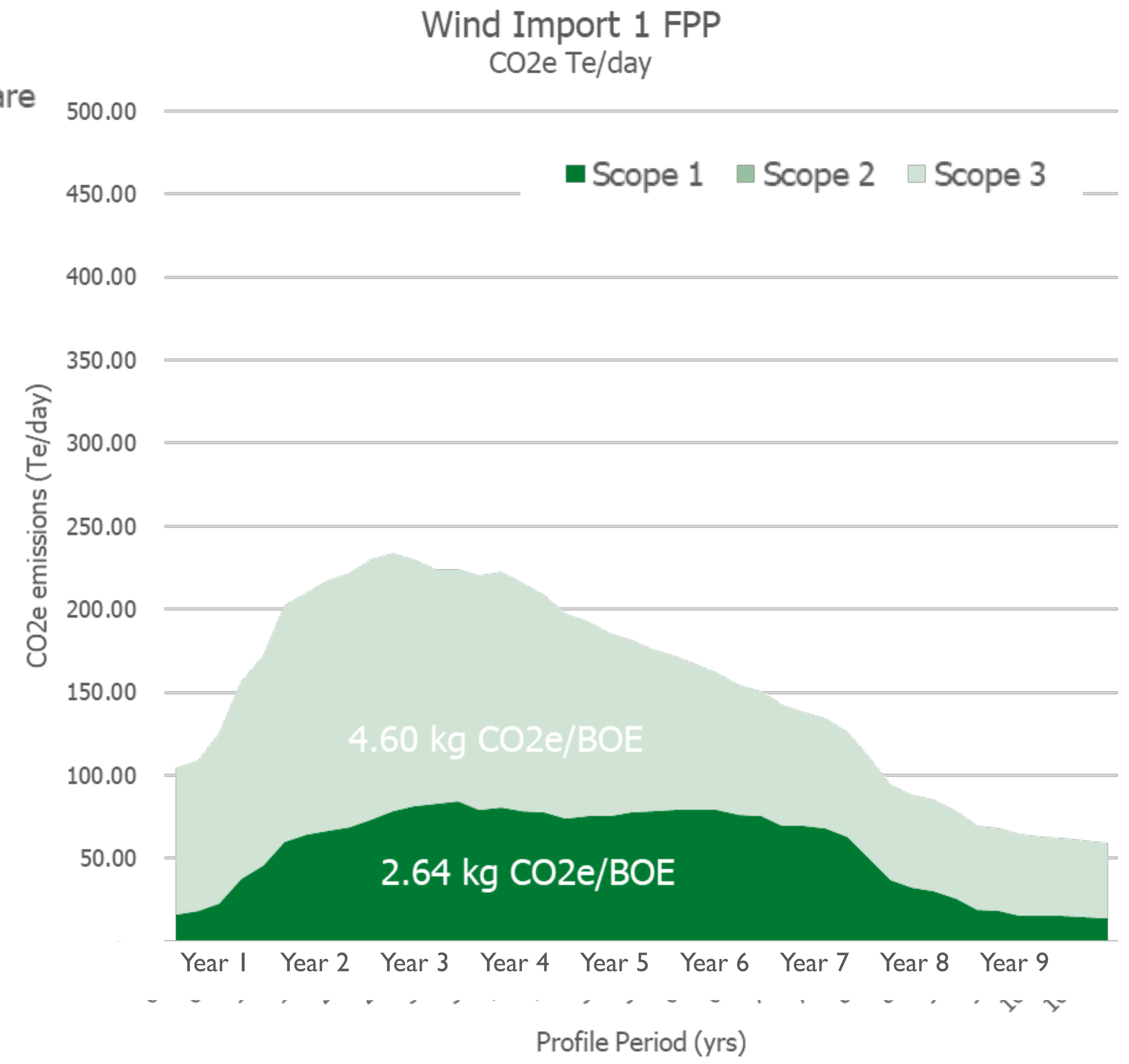




Emissions, by cause and scope
Local wind and wave power

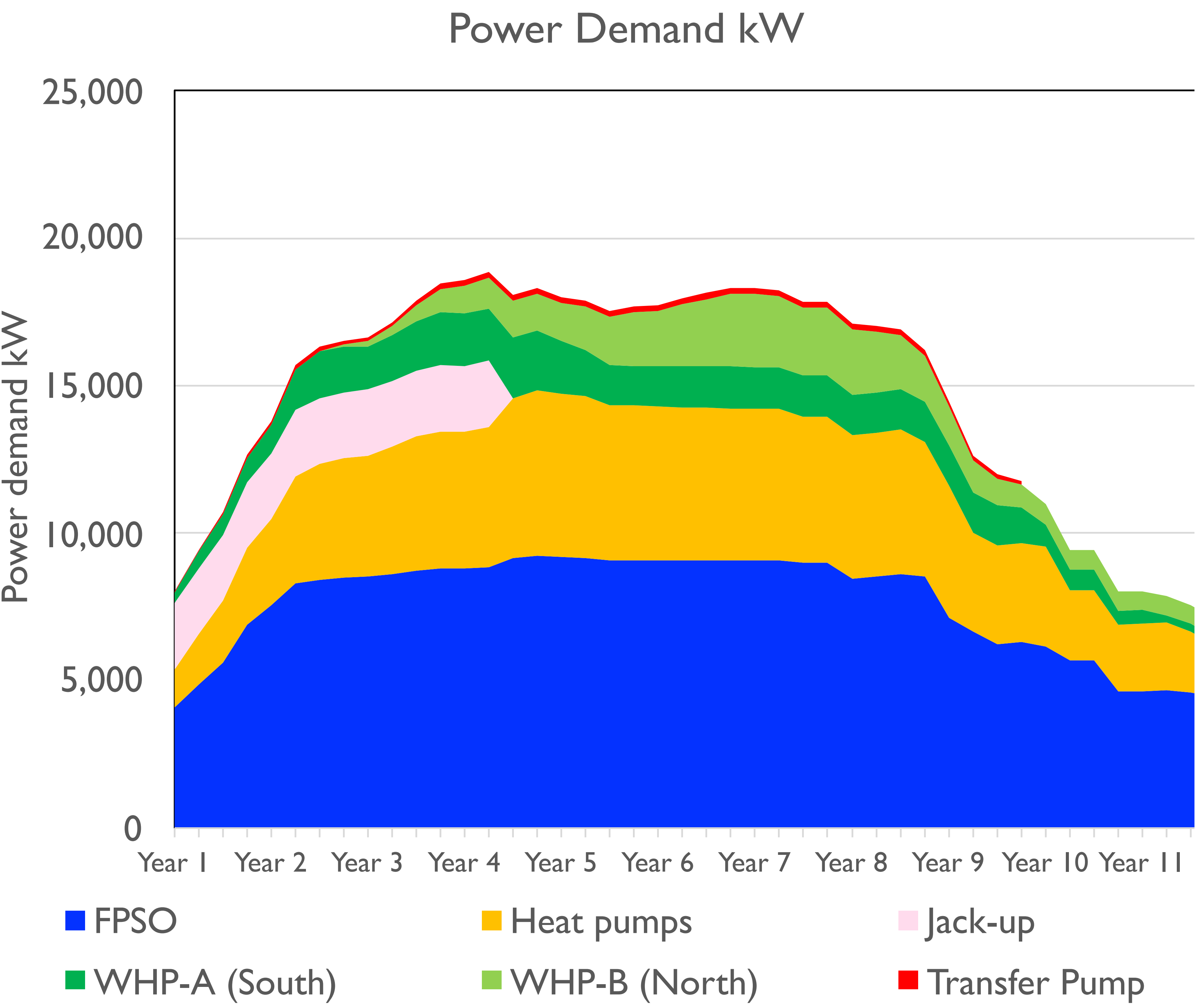


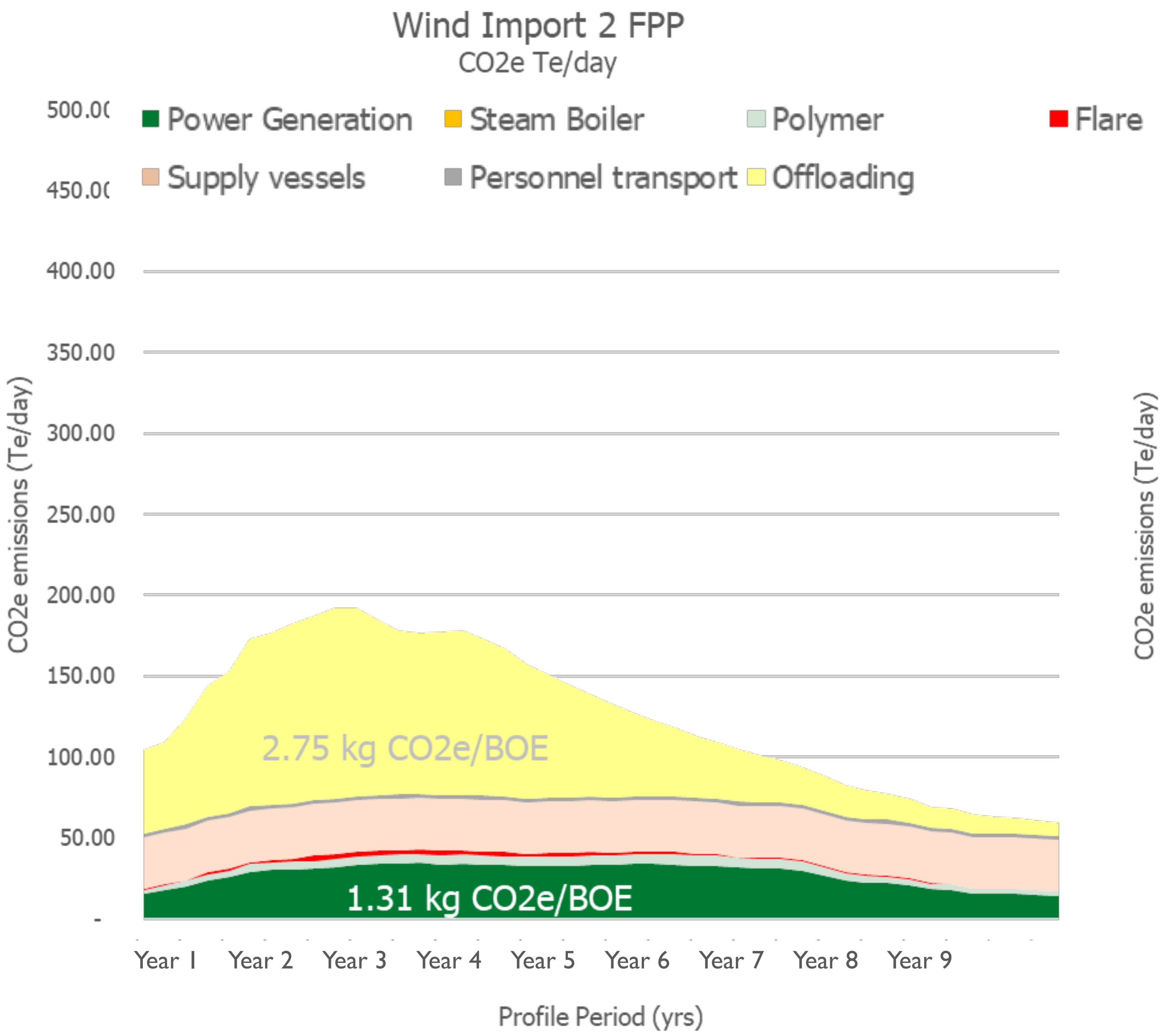


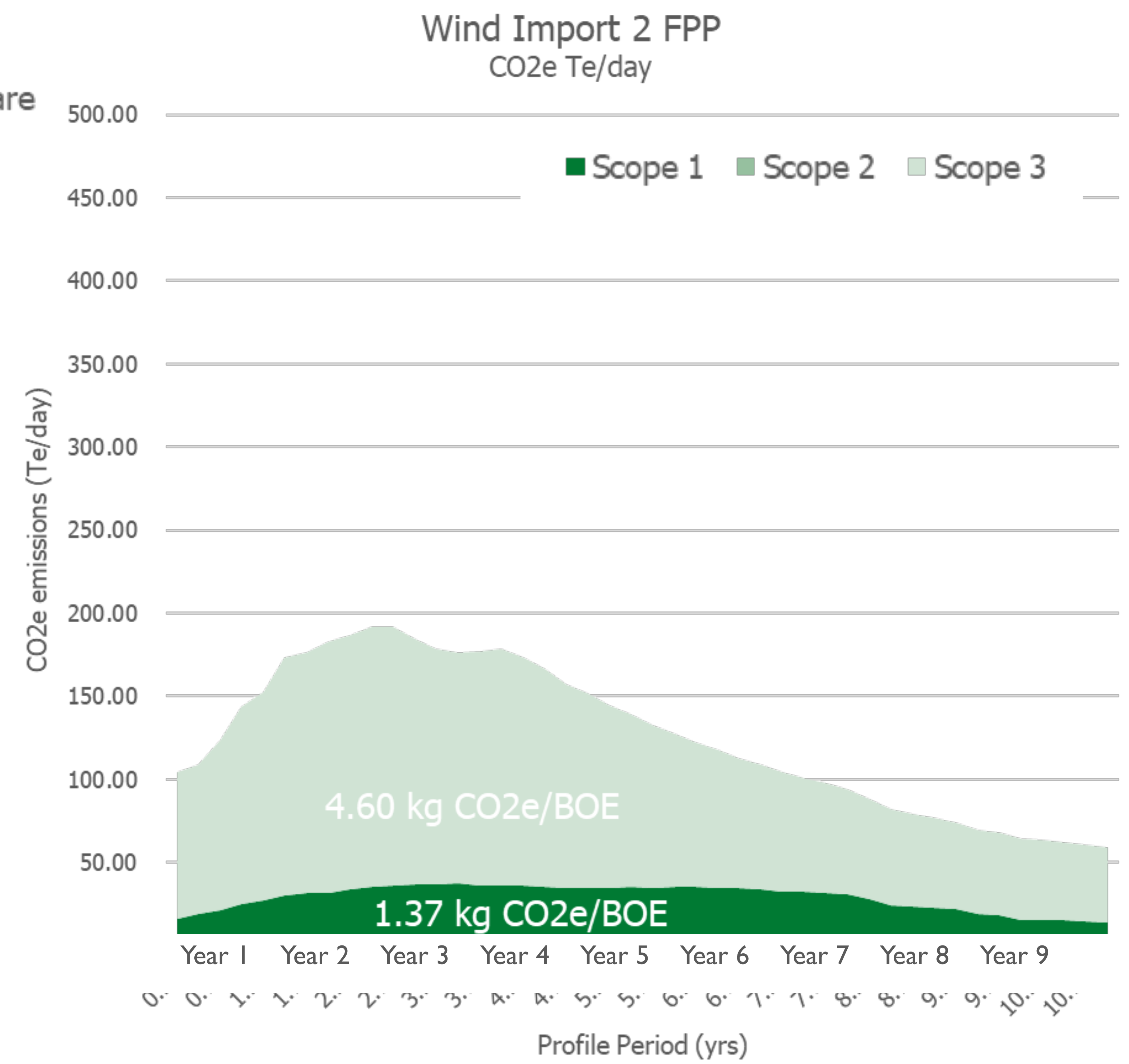


- Local renewable power eliminates the need for a gas import pipeline and halves emissions again
- Unit will be a 12MW wind turbine with a 2MW wave power generator from FPP

Emissions, by cause and scope
Two wind and wave power units



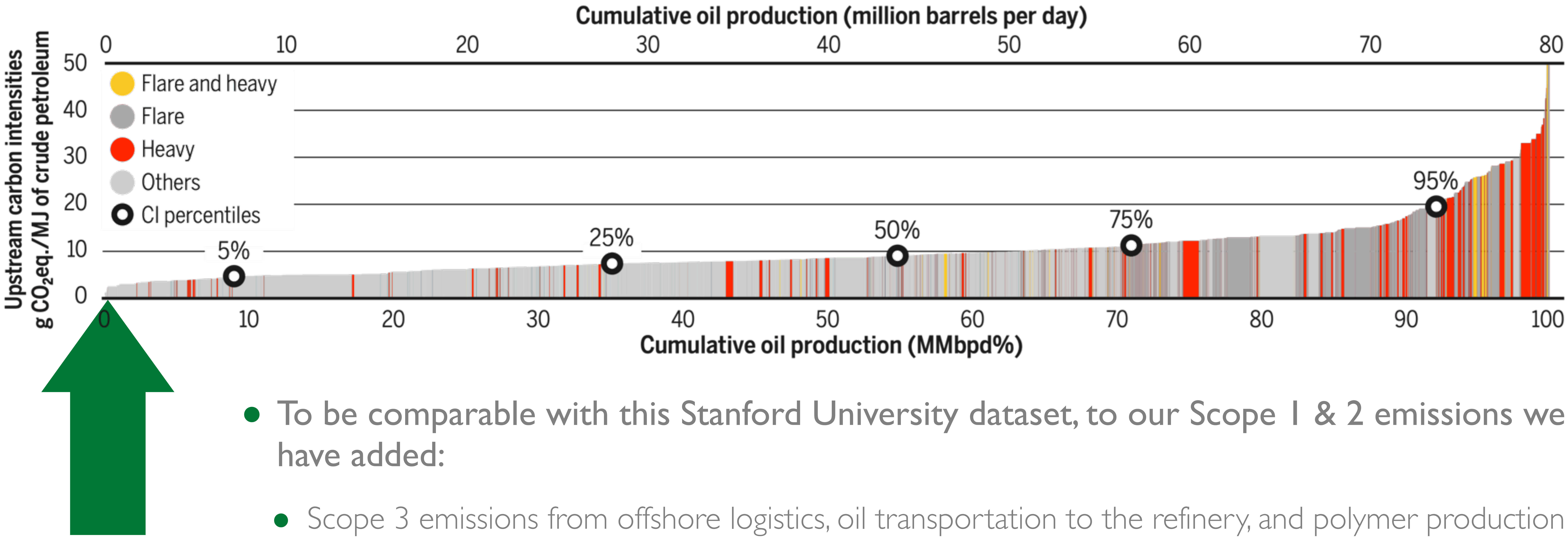




- Additional unit halves emissions again, but cost of abatement is c. $500/tonne
- Much better to focus on Scope 3 emissions rather than use resources on a second unit, unless the expenditure can be justified from incremental recovery

Comparison with global oil production emissions
Viscous oil doesn't have to mean high emissions

ORCADIAN ENERGY



Pilot emissions will lie in the lowest 5% of global oil production

- To be comparable with this Stanford University dataset, to our Scope 1 & 2 emissions we have added:
  - Scope 3 emissions from offshore logistics, oil transportation to the refinery, and polymer production
  - Estimates of emissions during the exploration and development phases (done using the Stanford tool)
- Pilot field comparable emissions are 1.4 gCO_2eq/MJ with a single wind turbine

Masnadi et al (2018). Global carbon intensity of crude oil production. Science. 361. 851-853. 10.1126/science.aar6859.

Auditor: PKF Littlejohn

15 Westferry Circus
London E14 4HD

Broker: WH Ireland

24 Martin Lane,
London EC4R 0DR

Banker: Barclays

Level 25, 1 Churchill Place,
London, E14 5HP

Lawyer: Hill Dickinson

The Broadgate Tower, 20 Primrose Street
London EC2A 2EW

Lawyer: TandonHildebrand

Labs Atrium, Chalk Farm Rd,
London, NW1 8AH

Registrar: Neville

Neville House, Steelpark Road,
Halesowen, B62 8HD

Public Relations: Tavistock

1 Cornhill,
London EC3V 3NR

Competent Person: Sproule

President Kennedylaan 19
2517 JK Den Haag, The Netherlands

Registered Office

6th Floor 60 Gracechurch Street, London,
United Kingdom, EC3V 0HR

Head Office

6th Floor 60 Gracechurch Street,
London, United Kingdom, EC3V 0HR

Contact Details

email: steve.brown@orcadian.energy
telephone: +44 (0) 20 3603 1941
twitter: @orcadian_energy
website: https://orcadian.energy

ORCADIAN ENERGY PLC