RESponsible Energy Islands – Leading by example

Neil Kermode
Managing Director

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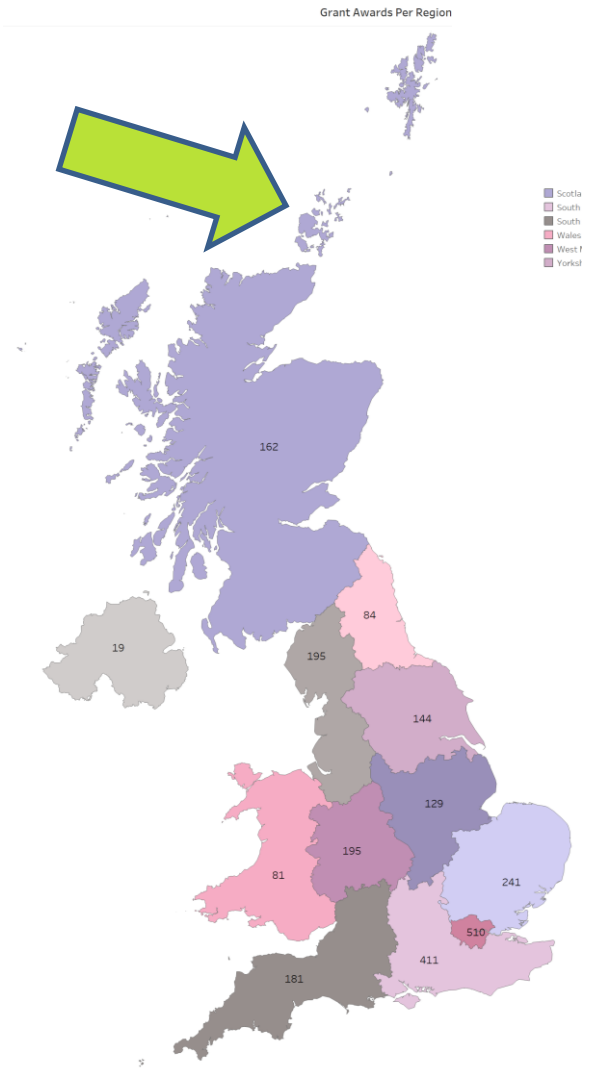
Orkney



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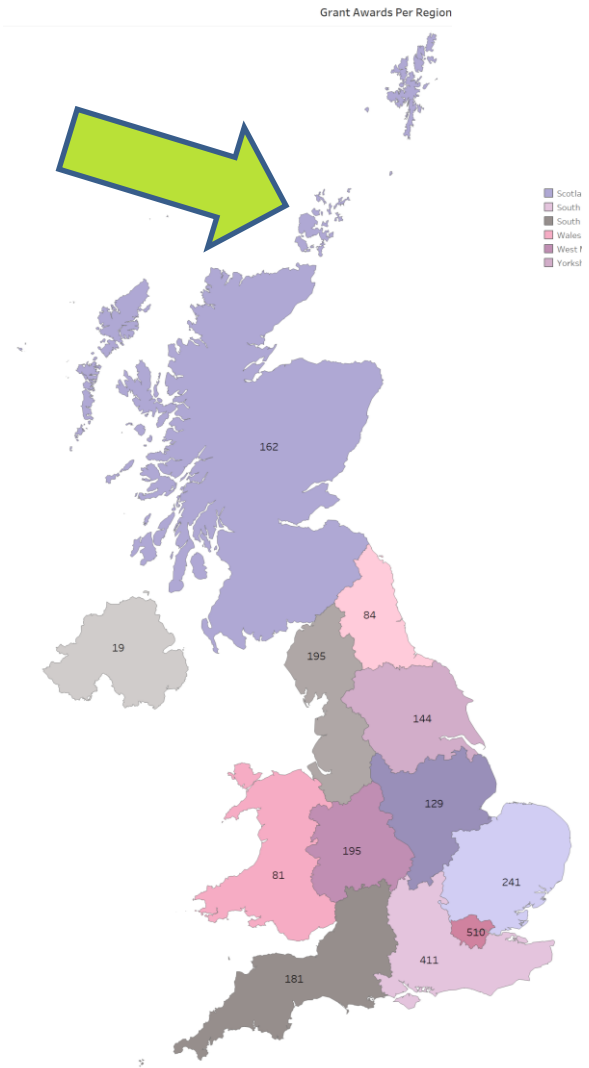
Orkney



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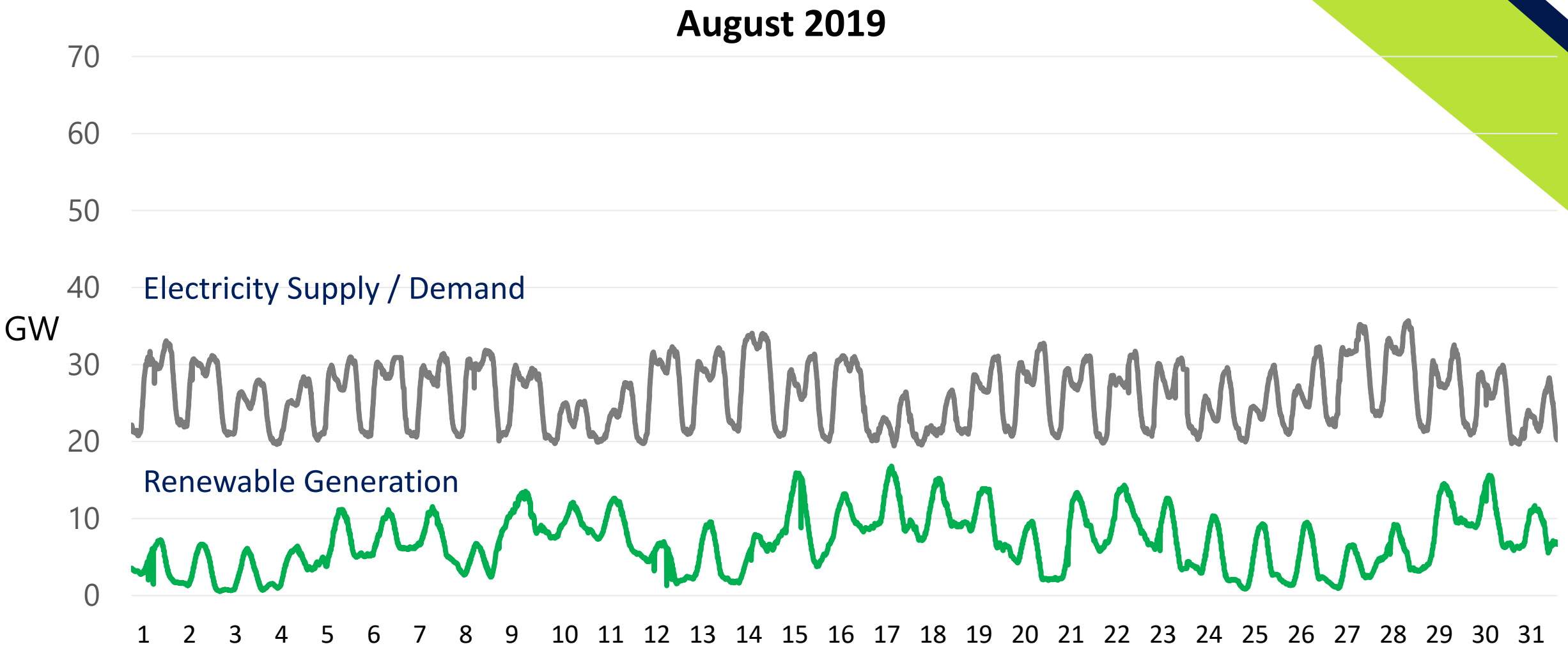
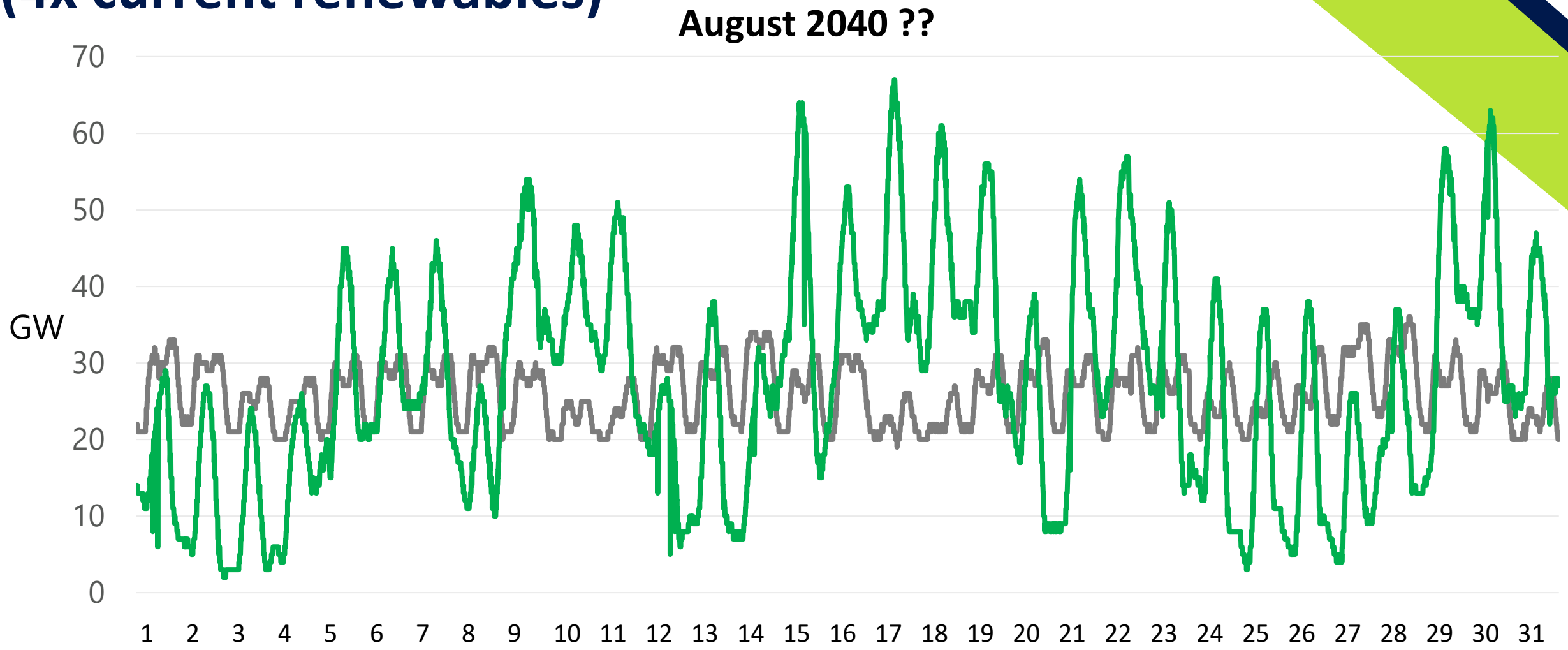
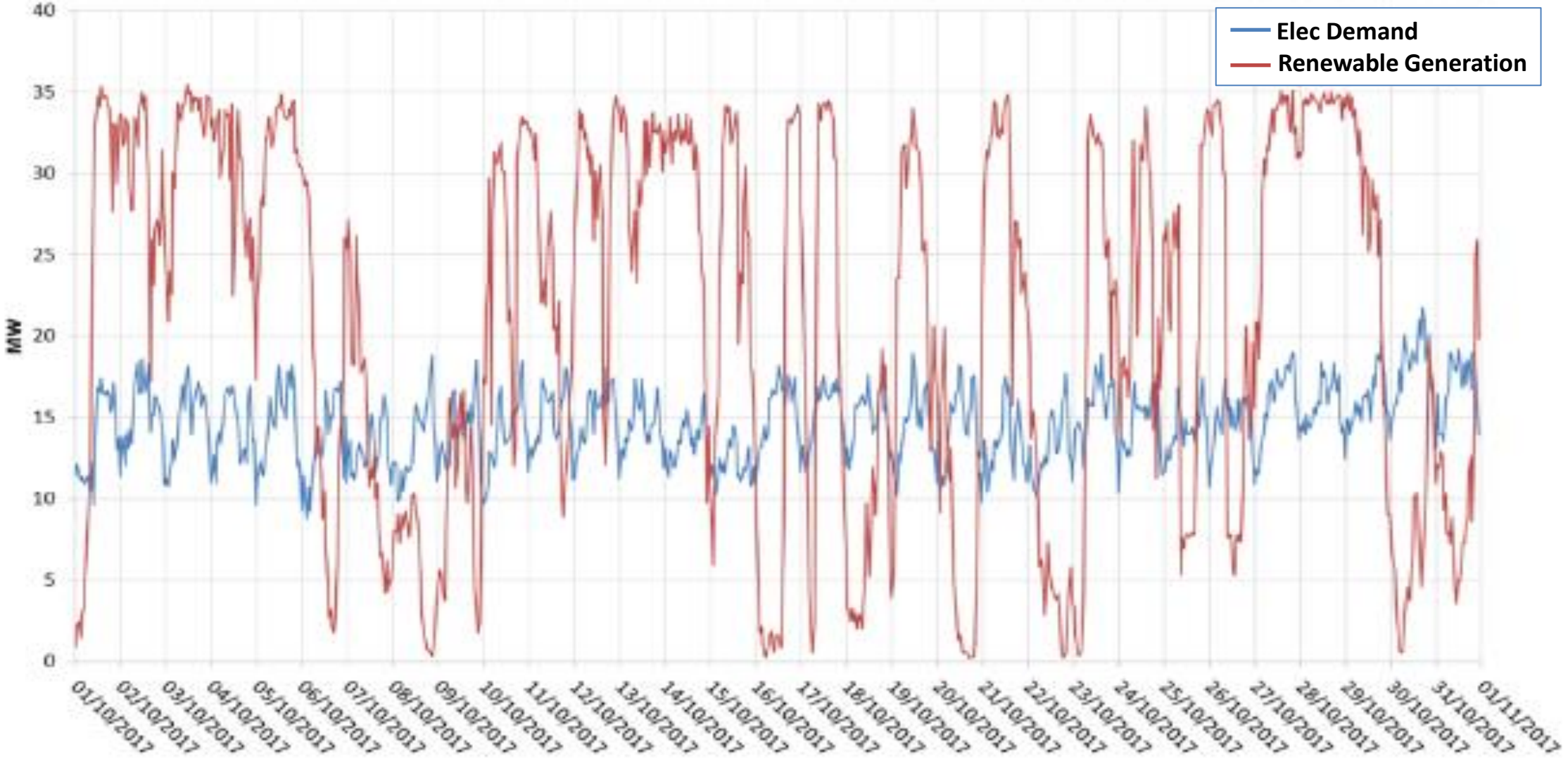
UK electricity system - today



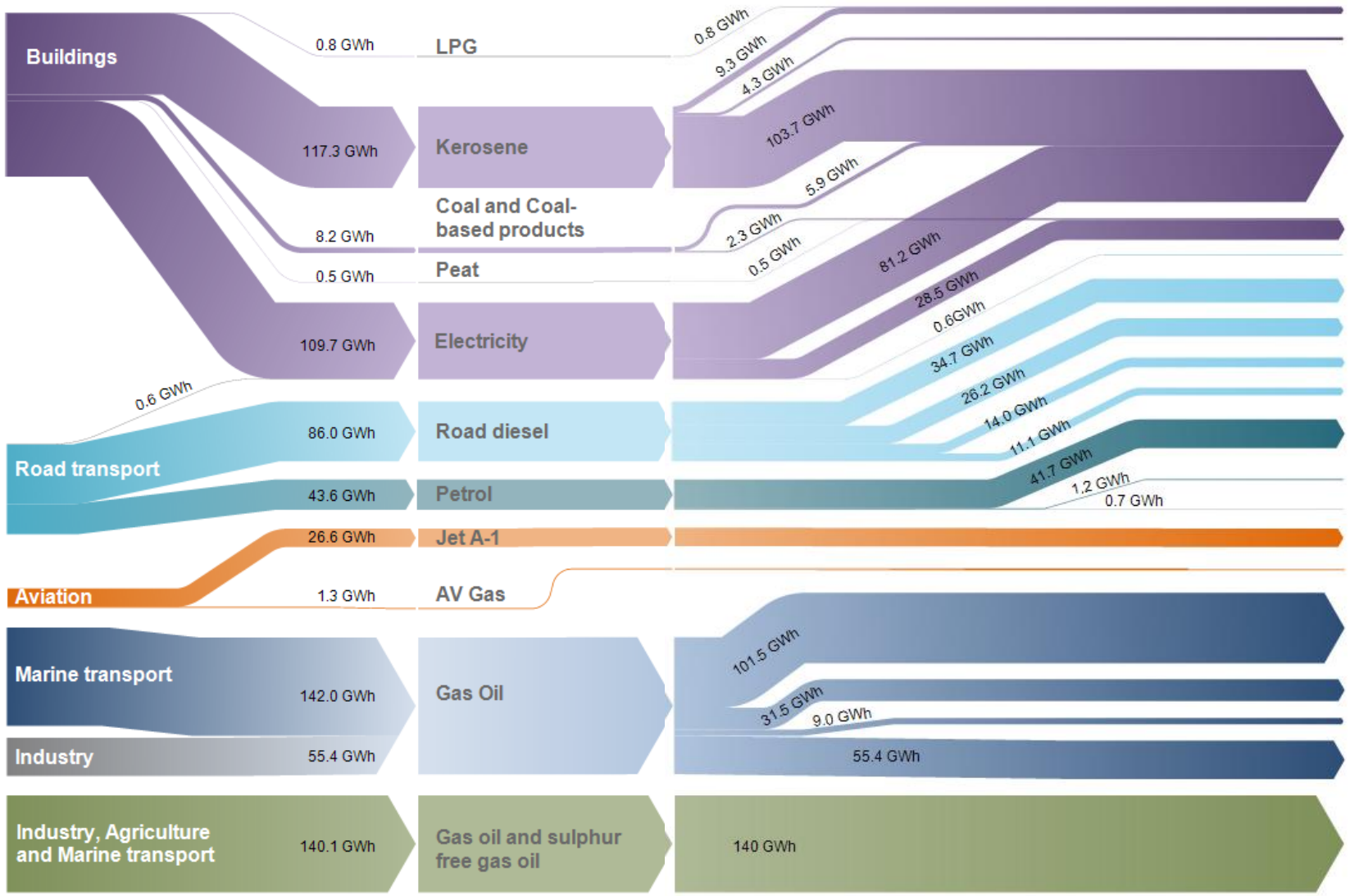
UK electricity system – 2040
(4x current renewables)



Orkney electricity system – today



Orkney Energy 2019



Public administration
Commercial
Domestic
Commercial and Industrial
Electric vehicles
Diesel cars
Diesel LGV
HGV
Buses
Petrol cars
Petrol LGV
Motorcycles
Off island flights
Inter island flights
Ferry services to the mainland
Inter island ferries
Towage and harbour craft
Crude oil processing
Industry, Agriculture and Marine transport

Heat & light

Transport (largely)

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1. Hydrogen from tides

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Orkney inter-island fleet

- 9 vessels = 2,800,000 litres of Gas Oil per year

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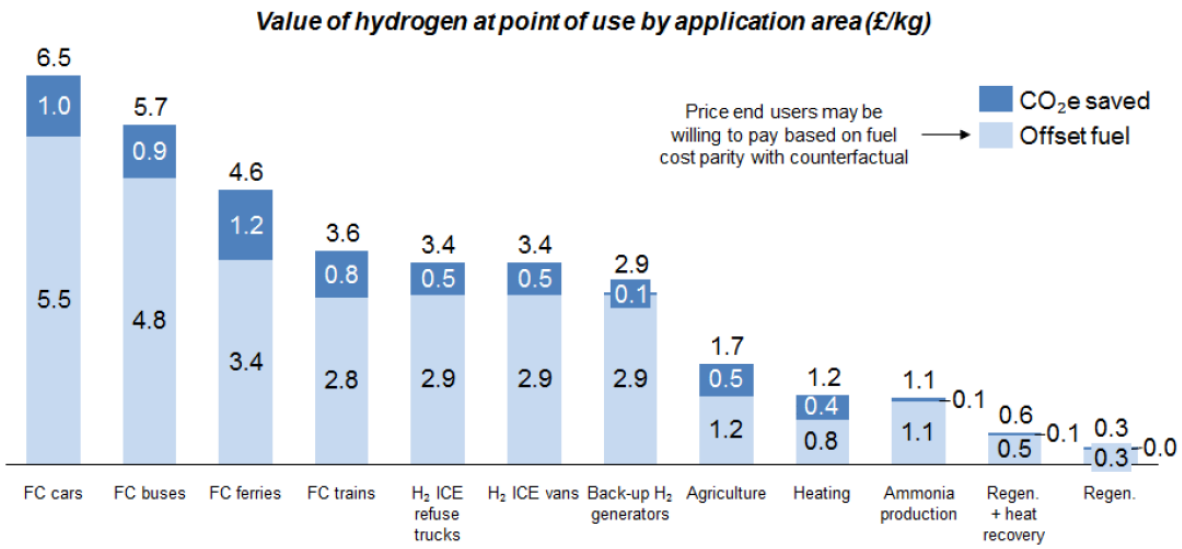
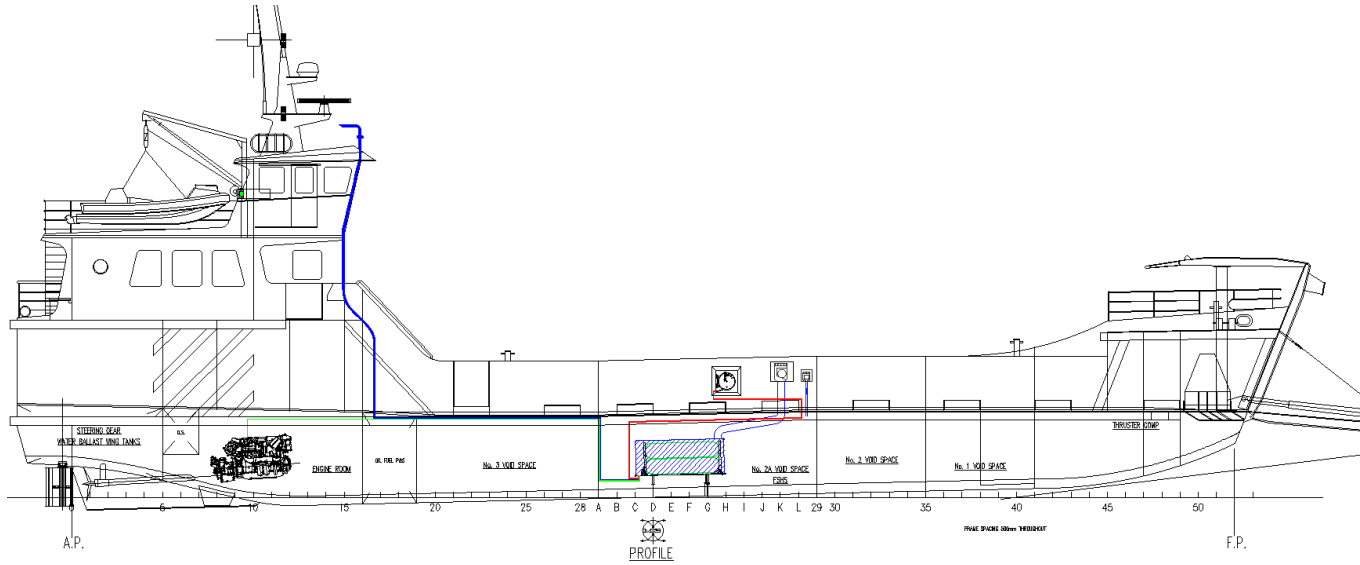
What have we been doing in shipping?

1. Make hydrogen
2. Transport it
3. Use it

- Surf n Turf – cold ironing - ashore
- Big Hit – (+vans and boilers)
- Hydyme – auxiliary power - afloat





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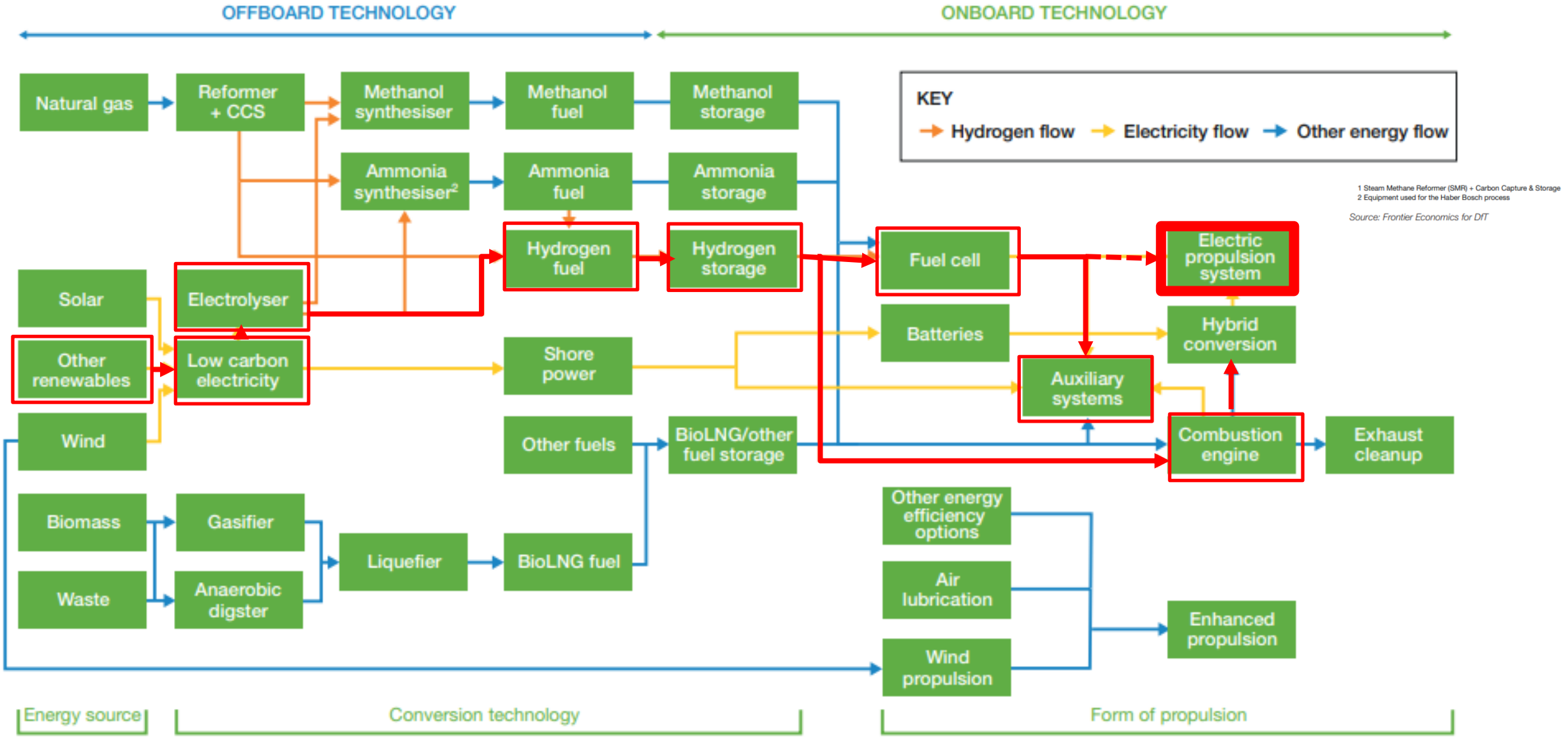
Fuel options



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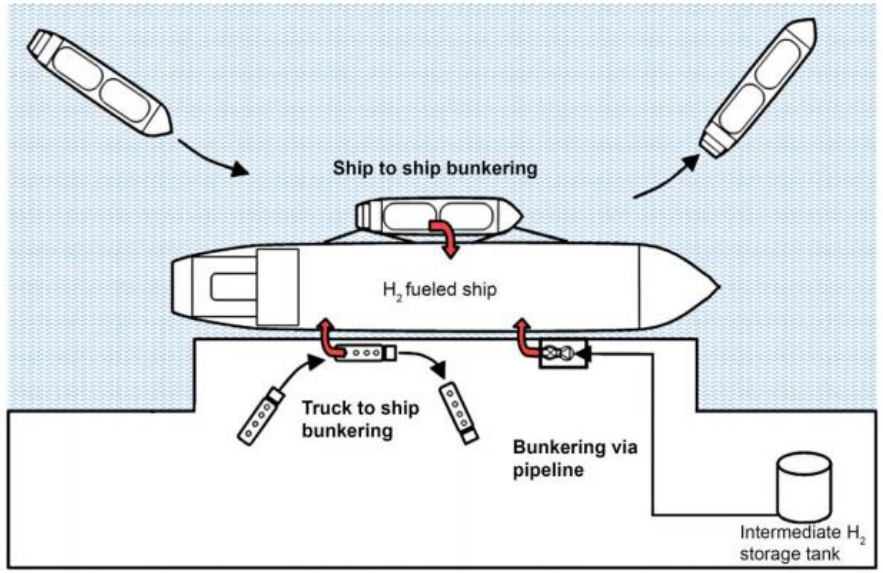
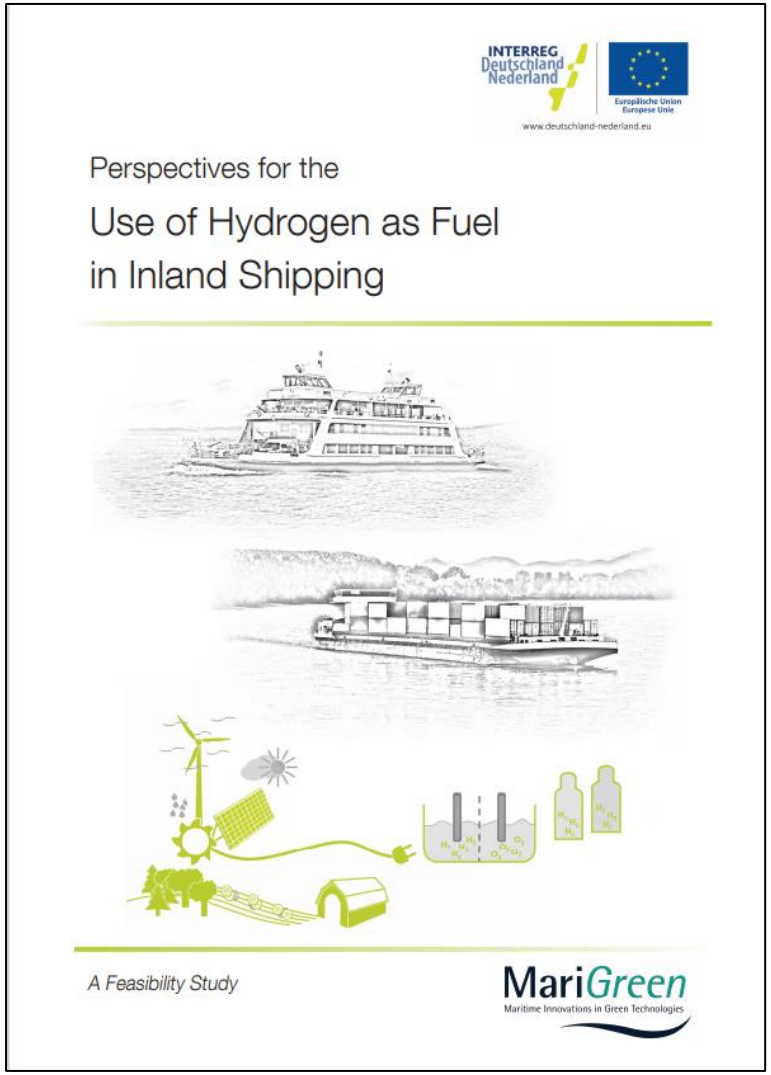
MariGreen



Operational Aspects	CH_2	LH_2	LOHC
Noise/vibration	++	+	+
Emissions (exceeding regulation)	n/a		
Range	-	+	+
Reliability	++	o	-
Easy bunkering	+	o	++
Cost per ton (or person) and km	+	o	-
Handling (crew competences)	+	o	-



http://marigreen.eu/wordpress_marigreen/wp-content/uploads/2018/11/Hydrogen-Feasibility-Study-MariGreen.pdf

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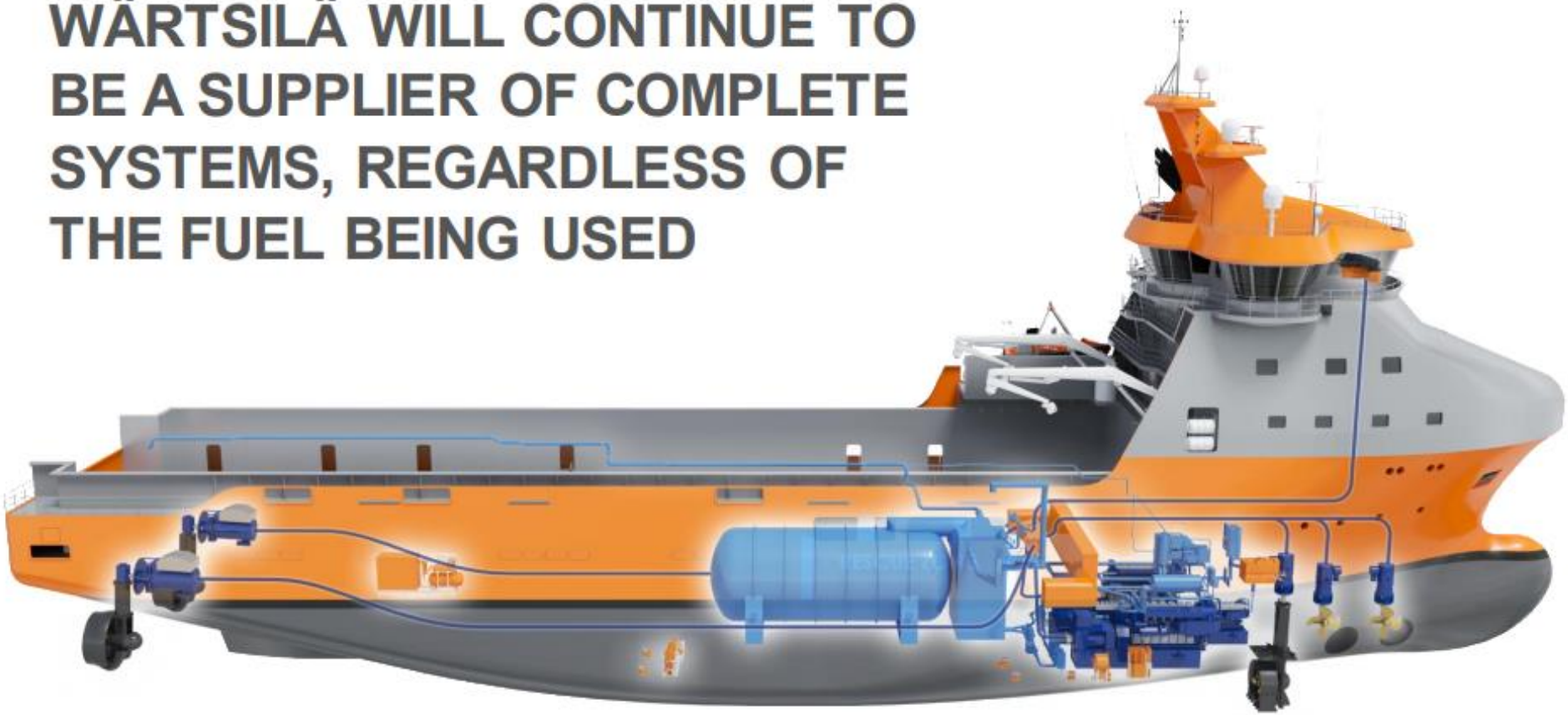
Industry

WÄRTSILÄ

WÄRTSILÄ WILL CONTINUE TO BE A SUPPLIER OF COMPLETE SYSTEMS, REGARDLESS OF THE FUEL BEING USED



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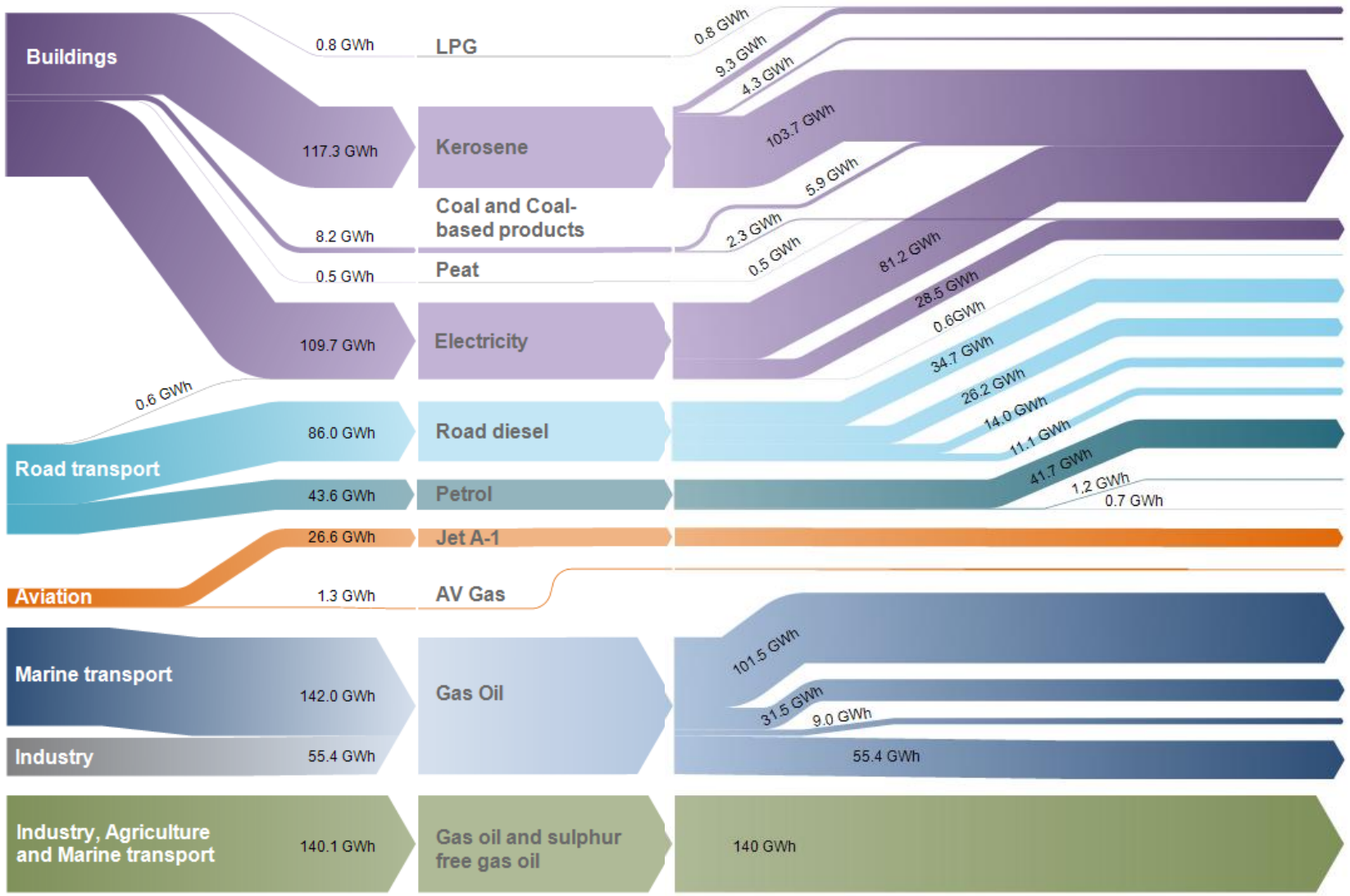
Orkney Energy 2019



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Crude oil processing
Industry, Agriculture and Marine transport

Heat & light

Transport (largely)

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2. Aviation

Local statistics:

180,000 passengers

£2,100,000 fuel use
2,600,000 litres Jet A-1
140,000 litres AV Gas

6,842 Tonnes CO_2

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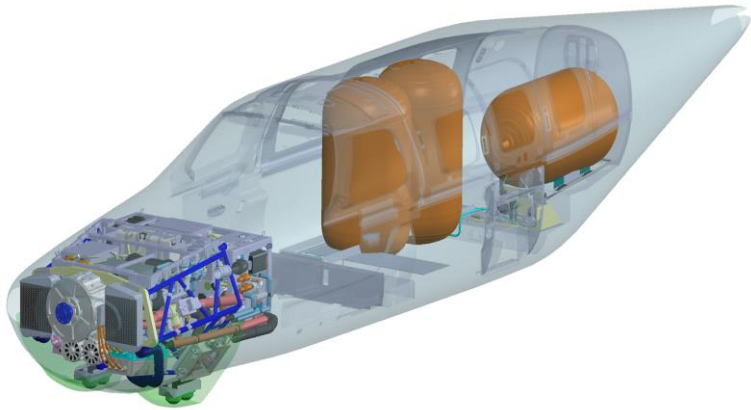
HyFLYER – Net Zero Aviation

EMEC HYDROGEN

- £5.3M project
- Hydrogen powertrain
- Battery to fuel cell phased tests
- 250-300 nautical mile range
- Orkney demo flight 2020



UKRI Innovate UK

AEROSPACE TECHNOLOGY INSTITUTE

HyFLYER

Intelligent Energy

ZEROAVIA

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Hydrogen Refuelling

Mobile truck and trailer unit

- 350 bar dispensing to J2601 non-communicative standard
- Compatible with multiple hydrogen sources
- Stepping stone for commercial aviation use
- H2 production in trailer - Enapter

FUEL CELL SYSTEMS®

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Results

- Learning by doing
- Creating pre commercial knowledge
- Practical demonstration
- Progress towards Net Zero

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