











Asset optimization

North Sea Transition Deal & Emission Reduction Action Plans
Tuesday 24th May 2022

Dr Kirsten Oliver



From ambition to reality: delivering a more sustainable world

Solar power  <p>397 Solar power projects</p> <p>950 MW World's largest CSP/PV hybrid project</p>	Wind power  <p>823 424 MW Wind power projects Largest onshore wind farm</p> <p>1386/1500 MW Largest offshore fixed/floating</p>	Nuclear power  <p>237 Nuclear power projects</p> <p>30+ GW Nuclear power projects</p>	Low-carbon hydrogen  <p>194 Low-carbon hydrogen projects</p> <p>36 GW Largest hydrogen electrolyzer studied, offshore wind based</p>	Energy transition materials  <p>248 Energy transition materials projects (excl. copper)</p> <p>25+ Lithium projects in brine concentrates</p>
Geothermal, hydropower (incl. pumped storage) & ocean power  <p>332 Geothermal, hydropower and ocean power projects</p> <p>20 GW Largest hydropower project</p>	Distributed energy systems (incl. EV & storage)  <p>245 Distributed energy systems incl. EV and storage projects</p> <p>190 MW / 400 MWh EPC energy storage project using Lithium-ion technology</p>	Carbon capture utilization & storage, GHG management  <p>262 Total number of projects</p> <p>100 MT Million tons of CO₂ expected to be captured and stored on world's largest CCS project</p>	Electrification, energy efficiency & grids  <p>493 Electrification, energy efficiency and grids projects</p> <p>70%+ Diesel reduction through electrification at world's largest iron ore mine</p>	Liquid renewable fuels, renewable natural gas, biomass-to-energy  <p>287 Liquid renewable fuels, renewable gas, biomass-to-energy (incl. WtE) projects</p> <p>\$211m Savings in a single project through licensor design optimization</p>

Implementing North Sea Transition Deal Aims

All UK operators have signed up to the NSTD

- Fits into OGA Asset Stewardship Expectation Framework
 - Stewardship Expectation 11 sets out framework for alignment with 2050 Net Zero goals
 - Sets specific time-based targets compared to 2018 emissions:

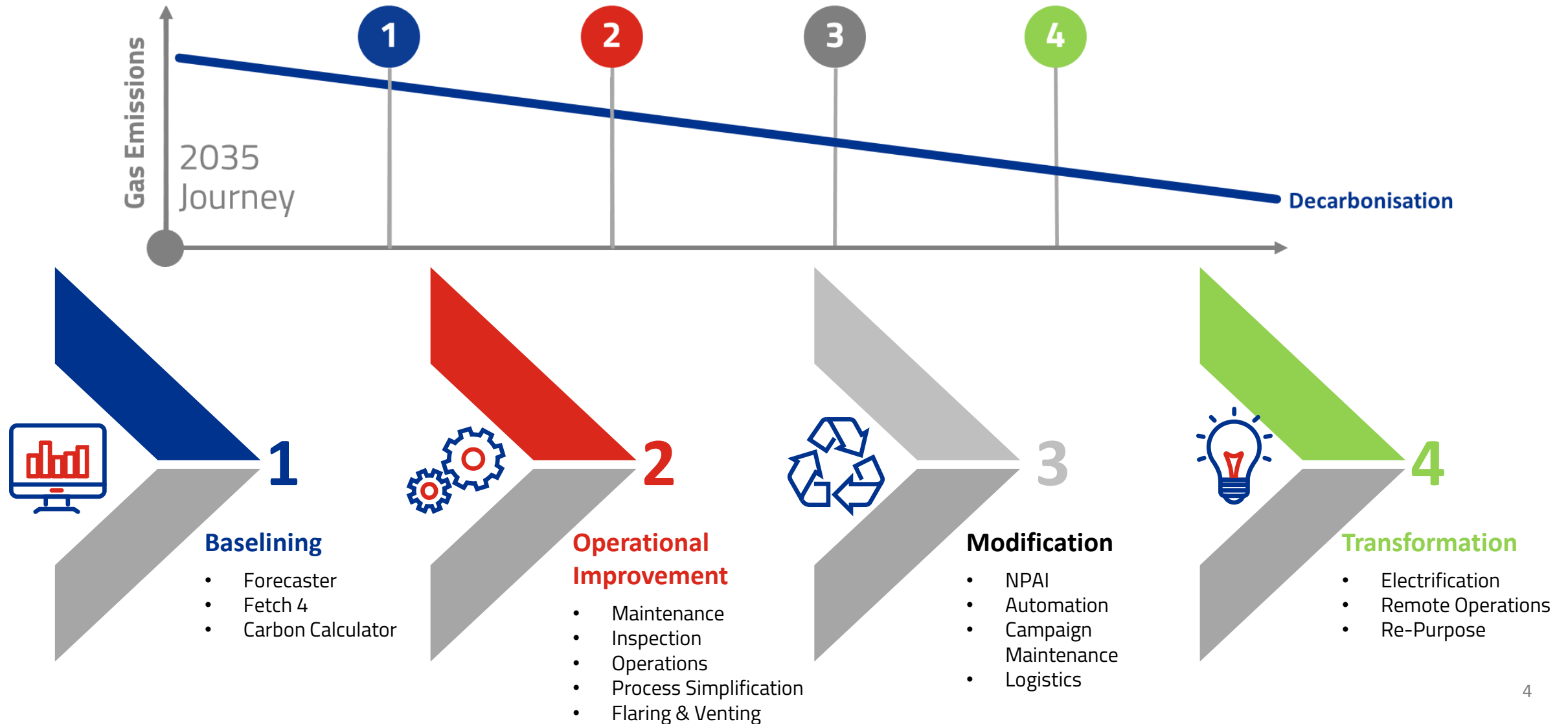
10% By 2025

25% By 2027

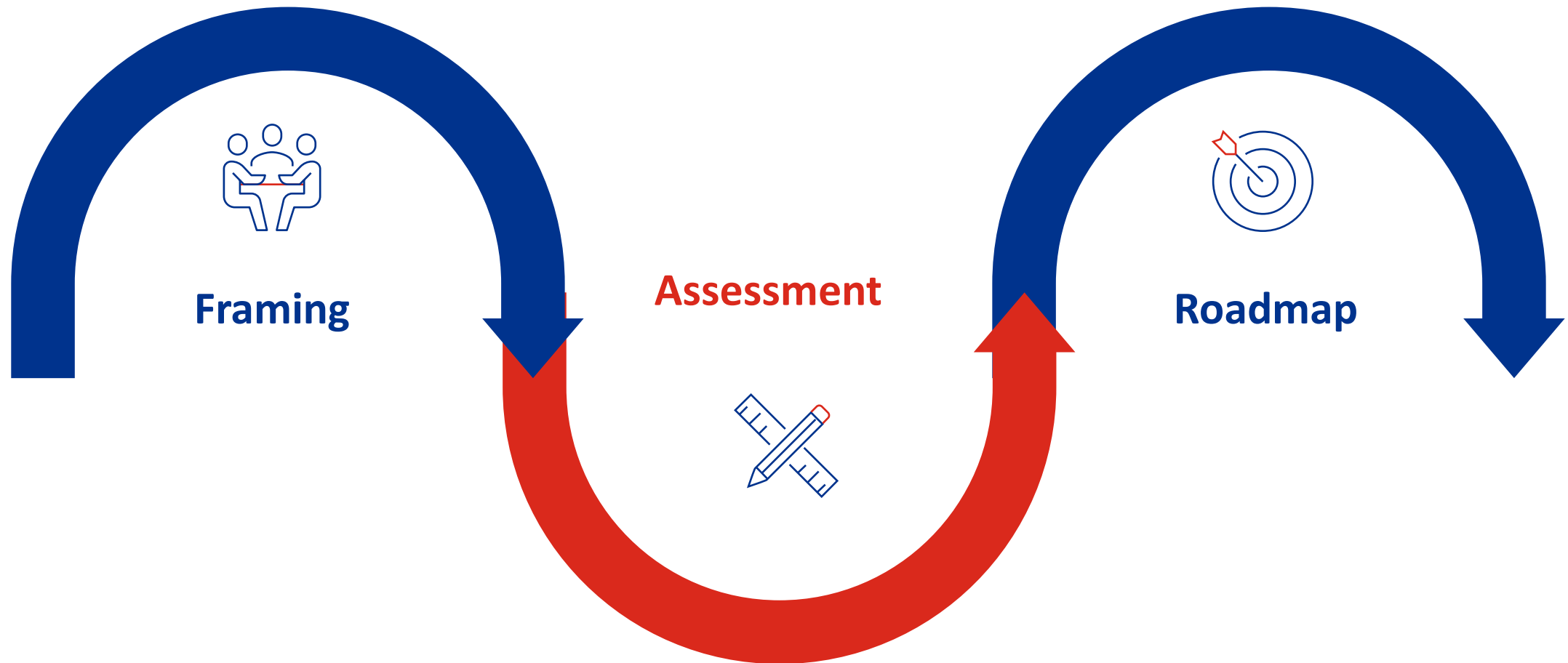
50% By 2030
 - Targets are industry wide – part can be due to decommissioning/decline however targets remain ambitious
- Operators obliged to identify all Emissions Reduction Opportunities (EROs)
- EROs need to be presented in an Emissions Reduction Action Plan (ERAP) that is maintained and regularly updated
 - This is an evolving requirement – frameworks are being developed now



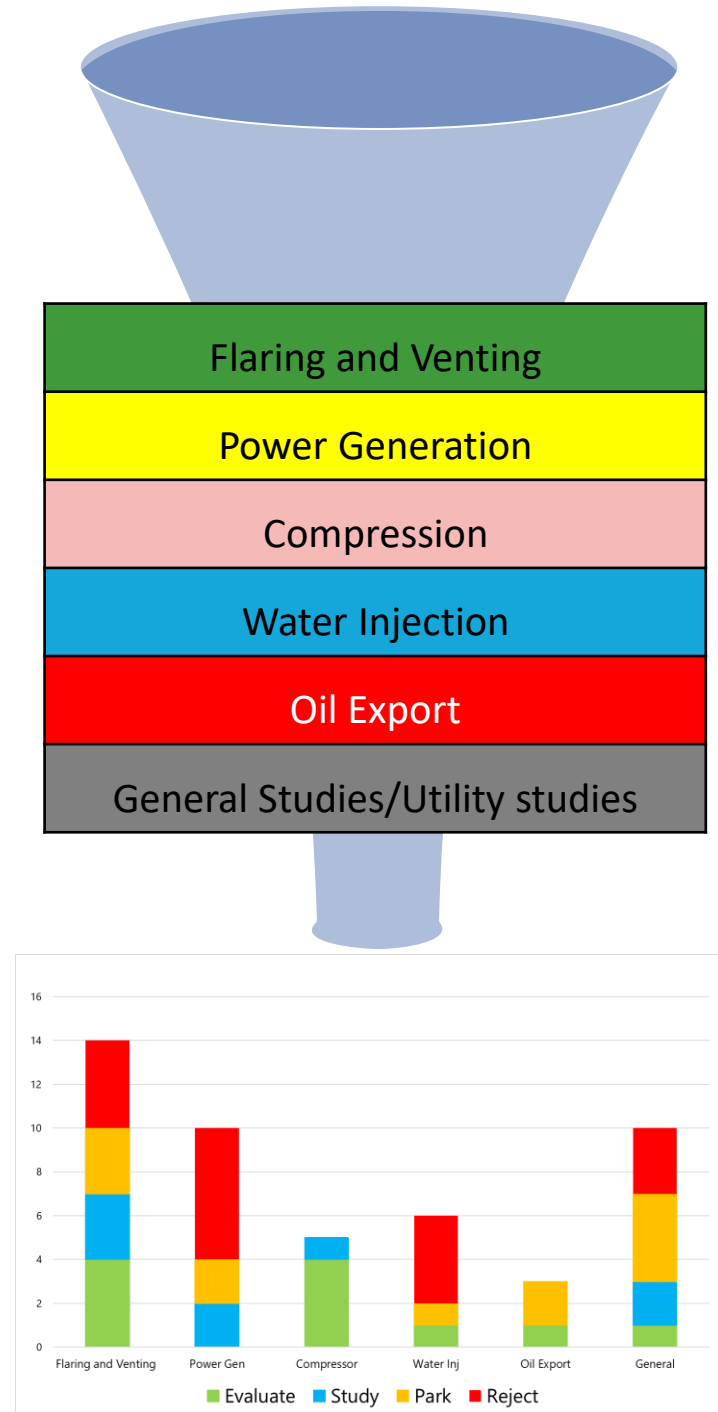
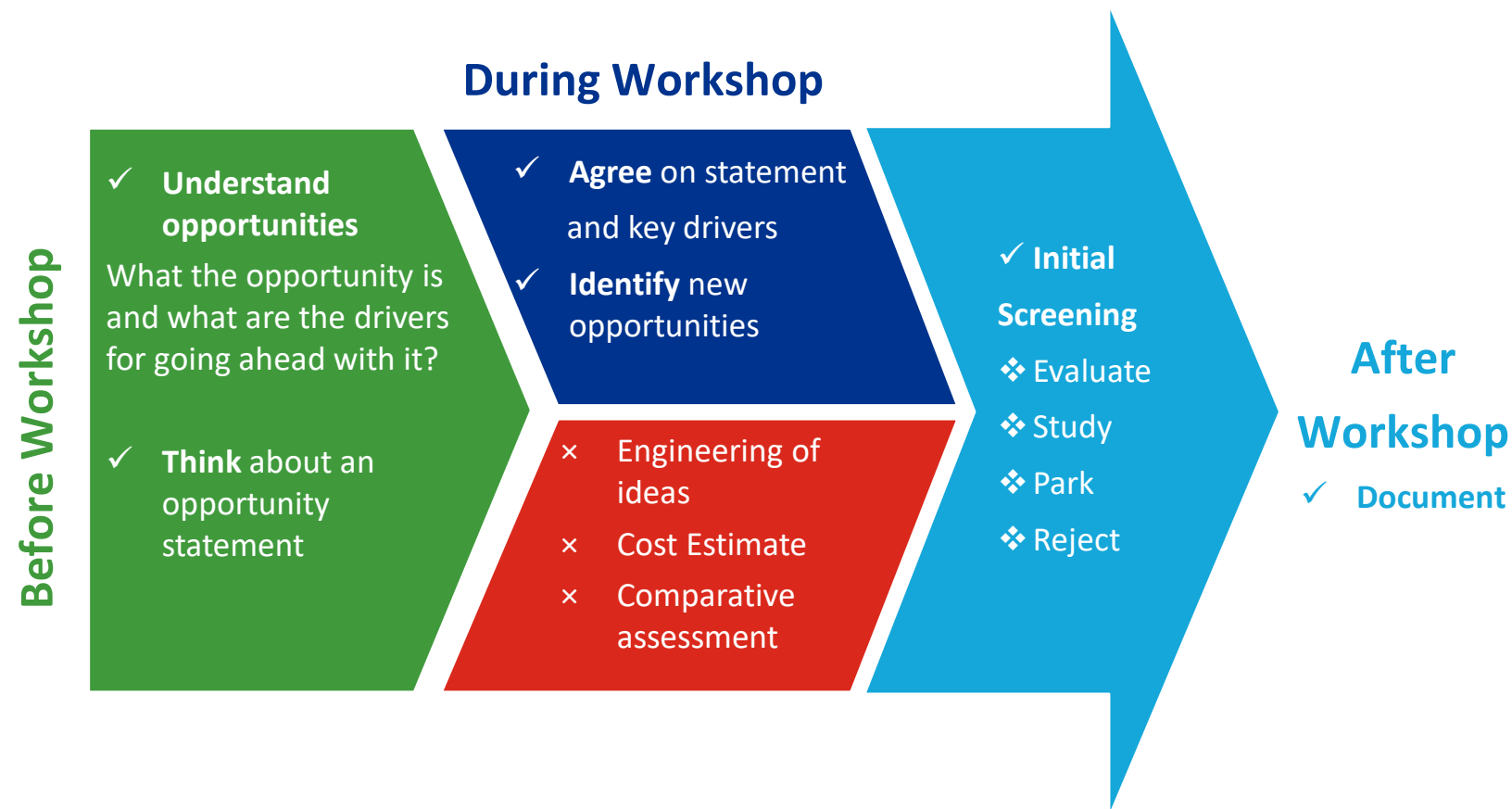
Decarbonisation



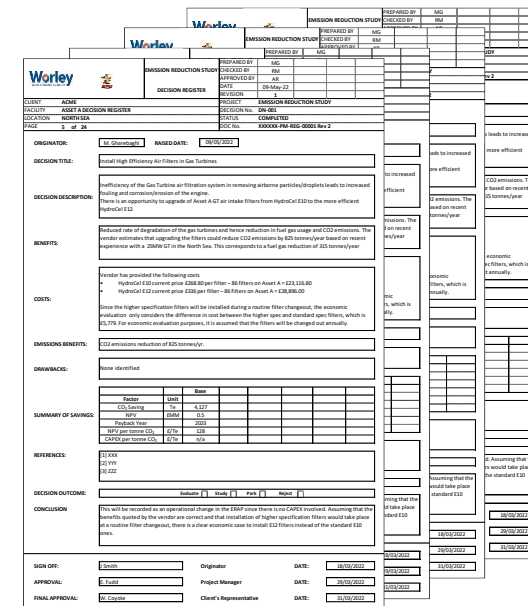
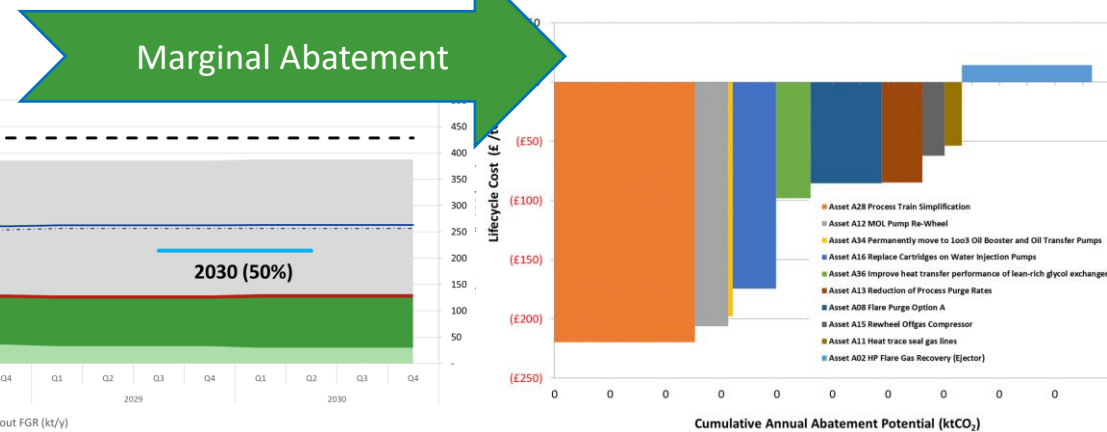
Our structured approach consists of three main stages



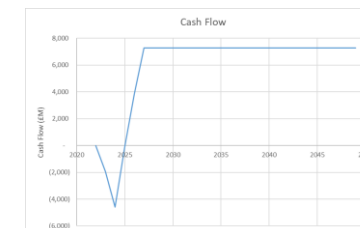
Framing

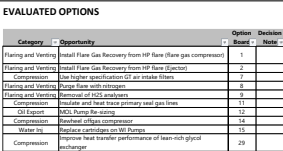


Quantify Benefit



<u>Output</u>		
Cumulative CO2 saving	106,686	tonnes
Cumulative CO2 saving	9.01	£MM
NPV	7.27	£MM
PVPI	2.59	£MM
Payback Year	2026	
IRR	67.71%	
NPV / tonne of CO2	68.19	£/t
CAPEX per tonne of CO2	52.49	£M/t
CAPEX	5,600	£M





Category	Opportunity	Option Board	Decision Note
Flaring and Venting	Passing Valve Identification and Repair	4	
Flaring and Venting	Operate with Glycol Flash Drum/flare PCV normally closed	10	
Compression	Improve compressor start up sequences	13	
General	Energy Efficient Lighting	16	
Power Gen	Back-up/ temporary generators for TARs (diesel)	21	
Power Gen	Using Alternative Fuels such as Biodiesel	20	
General	Process Train Simplification	23	

Category	Opportunity	Option	Board	Decision Note
Flaring and Venting	Install Flare Gas Recovery from LP flare (flare gas compressor)		3	
Flaring and Venting	Eliminate Flaring of hydrocarbons from primary seal gas		3	
Flaring and Venting	Improve Flaring Efficiency		3	
Power Gen	Performance monitoring opportunities		18	
Power Gen	Reduce Gas Turbine Air Inlet Temperature		22	
General	Review if Process Cooling can be optimized for lower oil rates		25	
Water Use	Discontinue technologies for water injection		26	
Oil Export	Permanant upgrade to 3000 GPD Booster and Oil Transfer Pumps		27	
Oil Export	Install VSSA on pump streams		28	
General	Production equipment technologies		30	
General	Organic Oil Recovery methods		31	

Category	Opportunity	Option	Decision
Flaming and Venting	IGL services	19	
Power Gas	Install Flywheel Reducer	13	
Water In	Upgraded engine valves to prevent erosion of WP pump	24	
Power Gas	Hot CombiCombustion Carbon Capture for Buzard	3	
Flaming and Venting	On demand oxygen for flare	3	
Water In	Recirc water system	3	
Water In	Reduce marring levels / modifications offshore through reduced maintenance burden	4	
General	CostOptimal	5	
General	Heat recovery from production fluids - recover heat from PW	6	
Power Gas	Reinvest operating philosophies during TAR (but costs) across all assets	7	
Power Gas	Power Gas (sustainability) saving 2020	8	
Power Gas	On performance (performance) saving 2020	9	

EXTERNAL DECISION

IMPLEMENT OPPORTUNITY

ERO TO STUDY

ERO START/END

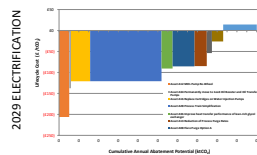
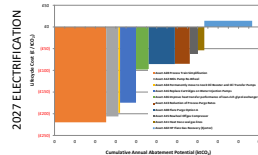
ASSESS OPPORTUNITY


ASSESSMENT PHASE

DEFINE PHASE

PROJECT IMPLEMENTATION

SN#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SN# Description	HP Flame Gas Recovery (Compressor)		HP Flame Gas Recovery (Burner)		Flare Purge Option A		Heat Recovery Load Gas Rates		MCH Purge By-Well		Reduction of Process Fuel Gas Rates		Reboiler Off-gas Compressor		Replace Cartridge Gas Strainer Applications, Pumps	
Compressor CDD/Flowing	None	52,948	70,352	58,028	9,222	18,160	22,008	12,007								15,658
Compressor	None	13,650	7,600	0	0	5,763	0	0								0
MPCH	None	-1	-3	-3	-3	-3	-3	-3								-15
Reboiler	None	No Payback	No Payback	No Payback	No Payback	No Payback	No Payback	No Payback								-15
Reboiler Gas	-2.9W	125	35	-65	-64	-226	-45	-42								120

[illegible]

	PROJECT TITLE:	
	ASSET A	
	DRAWING TITLE:	
	EMISSIONS REDUCTION ACTION PLAN	
DRAWING NO.:		REVISION:

Next Steps

- Possible template for all North Sea assets
- Sets framework for monitoring progress towards NSTD targets
- Sets a framework for asset plans moving forward
- ERAP is a live document
 - Needs at least annual update





Questions

