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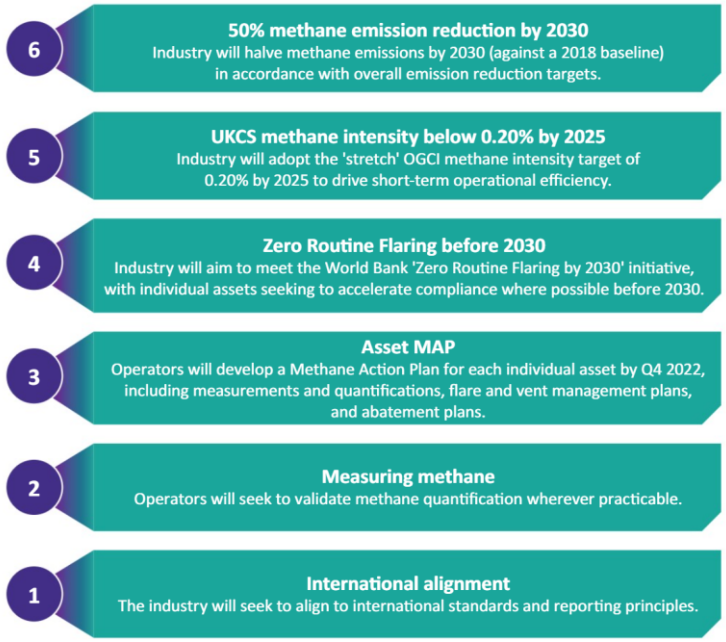
Environmental Implications of Flaring

There is a NEED to improve our control of the quantities of Methane which are emitted to the atmosphere via flaring from oil and gas production facilities because, Methane has an impact on atmospheric warming estimated to be more than 84 times greater than CO2 (over 20 years).

Therefore, if we can reduce the quantities of Methane emitted to atmosphere it creates the potential to slow down global warming in the near term and buy us time to transition towards renewable energies



Zero Routine Flaring 2030

The effects of Combustion Efficiency

Flaring from oil and gas production facilities is the process of burning the various hydrocarbon components which make up the waste, or excess gas produced and thereby converting these to Carbon Dioxide.

The term associated with the effectiveness of a flare is **Combustion Efficiency.**

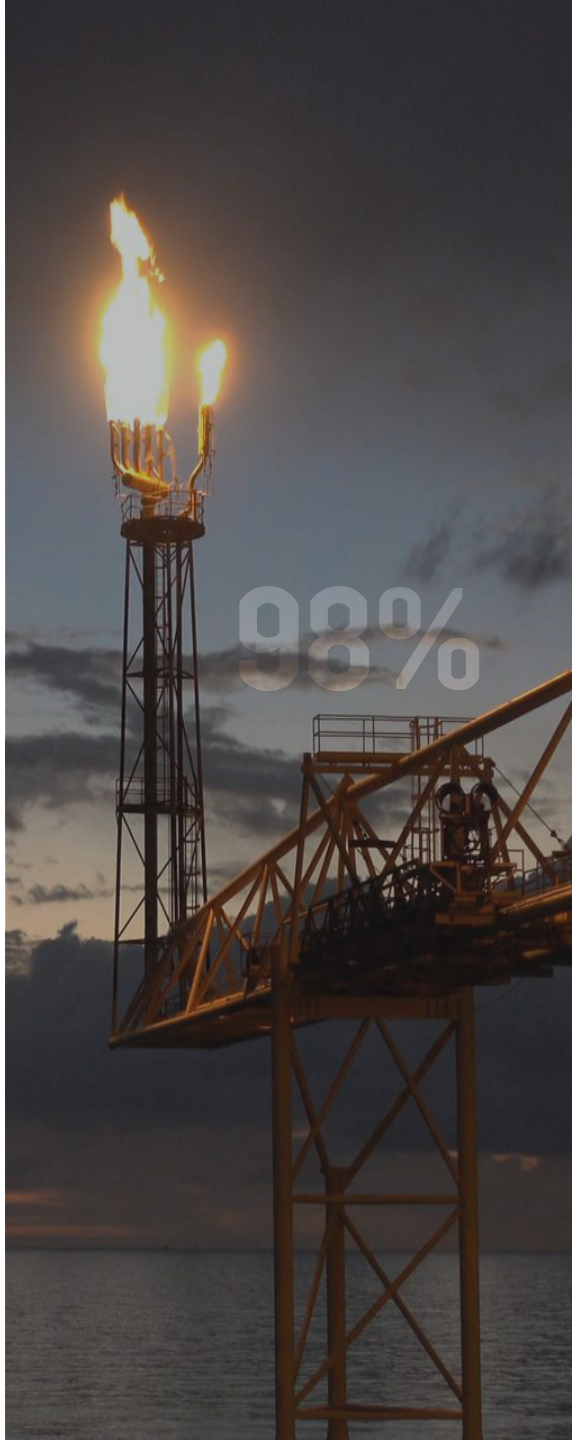
$$CE = 1 - 0.00166e^{\left(\frac{0.317*Windspeed}{(ExitVel*g*Dia)^{0.33}}\right)}\left(\frac{LHV_{CH4}}{LHV_{Flare}}\right)^3$$

Where:

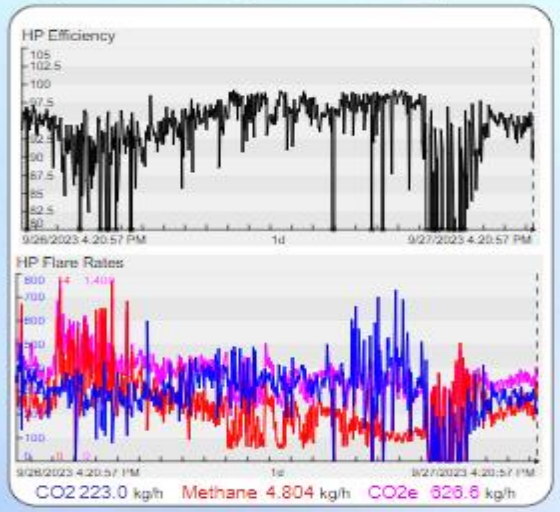
Dia: diameter of the flare pipe
g: gravitational constant
LHV_{CH4} : lower heating value of methane

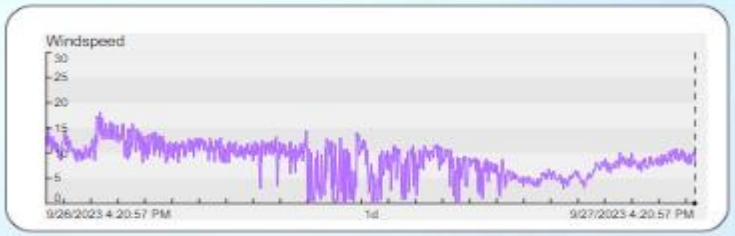
LHV_{Flare} : lower heating value of the flare gas composition
ExitVel: velocity of the gas within the flare pipeline

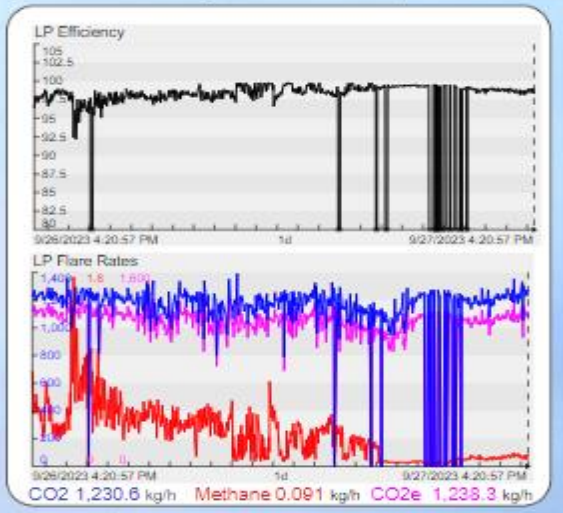
Windspeed: localised speed of the prevailing wind



Methane Combustor Overview







COMBUSTOR by ACCORD

A tonne of hydrocarbon will burn to give approx 3te of CO2 (for example methane - a tonne of methane combines with atmospheric oxygen gives 2.75te of CO2).

The CO2e is the mass of CO2 + mass of Methane x Methane warming potential - set to 84 in the inputs.

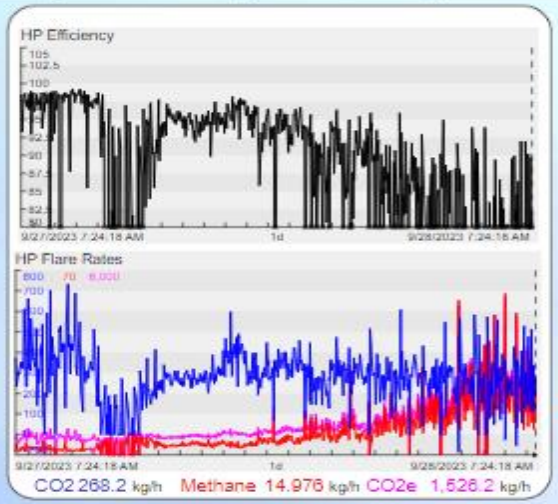
HP Flare

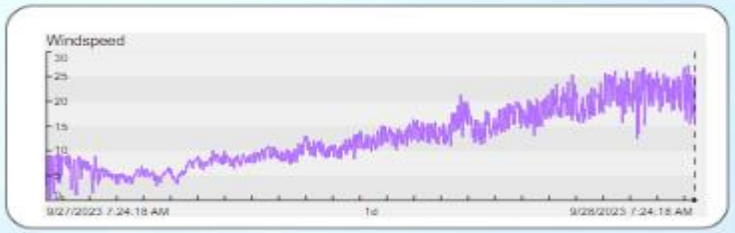
	Produced	Methane	CO2	CO2e
Curr. Day	2.5 t	0.0314 t	2.9 t	5.5 t
Prev. Day	6.2 t	0.1106 t	8.9 t	18.2 t

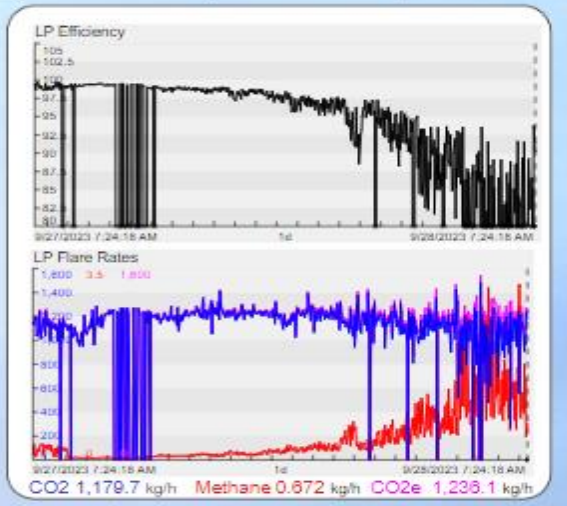
LP Flare

	Produced	Methane	CO2	CO2e
Curr. Day	4.6 t	0.00115 t	11.0 t	11.1 t
Prev. Day	11.0 t	0.01094 t	27.0 t	28.0 t

Methane Combustor Overview







COMBUSTOR by ACCORD

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HP Flare

	Produced	Methane	CO2	CO2e
Curr. Day	0.4 t	0.0305 t	0.4 t	2.9 t
Prev. Day	5.9 t	0.1794 t	6.9 t	22.0 t

LP Flare

	Produced	Methane	CO2	CO2e
Curr. Day	0.7 t	0.00172 t	1.4 t	1.5 t
Prev. Day	11.0 t	0.00760 t	26.7 t	27.4 t

Zero Routine Flaring 2030

Flaring Governance

North Sea Transition Authority

Annual Flare Consent

Petroleum Production Licence No(s). X123, Y123 and Z123

Consent to Flare Gas

1. This Consent is given on the condition that:

    a) gas shall not be flared as mentioned in paragraph 1 at an average daily rate that exceeds 32.33 tonnes; and
    b) this Consent shall terminate if any participating licensee has their licence revoked; surrenders the licence; or withdraws from the terms of the mutually agreed flaring application.

Department for Energy Security & Net Zero

UK ETS Installations

For fuel burnt in turbines we convert 100% to CO2 (government defined oxidisation factor of 1) but for flare source streams we only convert 98% (government defined oxidisation factor of 0.98).

Meaning that 2% is classed as un-combusted gas (with a high level of methane) which is currently not included in ETS reporting.

ACCORD

Net Zero Technology Centre

Technology Driving Transition

Dynamic Reporting

Operators should look to put the mechanisms in place, like Combustor, to dynamically report flare CE.

Governing Changes

Collaboration with NSTA and DESNZ to make changes to the relevant flaring regulations to allow for CE manipulation.

Educate a Greater Understanding

Continue to aim for zero routine flaring by 2030 but meanwhile educate our community to understand that an Increase in flaring can directly reduce overall emissions .