METAHNE COLD VENTING REDUCTION – A CASE HISTORY

CURRENT RELEVANCE

This case history is from a period before Herculean Climate Solutions was formed and is about a project for an oil company. This project identified a way to reduce unburned methane emissions by around 150,000 tonnes/year (equivalent to 12 million t/y of CO_2e based on a multiplier of 84[1]) and could have been implemented in 2020 to operate for 10 to 15 years resulting in a total reduction of up to 180 million tonnes of CO_2e. This is the equivalent to the emissions from a 4 GW coal-fired power station.

This project demonstrates key skills of the HCS team, including the willingness to acknowledge the scale of the problem that is known and to tenaciously seek viable solutions until one is found that can be applied, and then try to apply it. It also demonstrates that large climate solutions can have an economic ROI, and not just become a cost to a business.

All these qualities are needed to solve the climate crisis.

CLIENT

Oil Major, South East Asia, operating a 500 mmscfd fixed platform gas production facility. This is a case history of work by Steve Willis, prior to joining Herculean Climate Solutions, who was employed as Engineering Manager at a catalyst supplier to the client at the time he became aware of the scale of the methane release.

BACKGROUND AND CHALLENGE

This gas field, as with others in the region, contains gas that is a mixture of methane and carbon dioxide (CO_2). The concentration of CO_2 is far higher than onshore gas specification for the power stations. Consequently, the gas is separated offshore using membranes. The product stream contains a methane rich stream that meets the export specification, and the waste, or reject, stream is rich in the unwanted CO_2 which is vented to atmosphere.

Unfortunately, the nature of the membranes is that reject stream generally contains a noticeable concentration of the methane product mixed in with the rejected CO_2. The larger climate related problem from this facility is twofold: firstly, the reject stream is very large, this being a huge gas production platform, and secondly that the amount of unburned methane released with the CO_2 is also therefore very large and globally significant, having an atmospheric warming impact 20 to 80 times greater than the same amount of CO_2. The CO_2 is a natural fire extinguishant, which means that the residual methane cannot be burned to convert it to CO_2 to reduce its global warming potential - another technology is required.

RESOLUTION

Two potential solutions were identified: a thermal oxidiser and a separation system to recover the methane and return it to the product stream. Initial investigations indicated that both options were viable. Space for the equipment could be provided by installing it on a jack-up rig next to the producer platform, at an estimated total capital cost of $200 million.

The separation system was of most interest because of the potential additional revenue available of more than $50 million/year.

The potential availability of carbon credits was also investigated. There is currently no government backed carbon trading or carbon credit system in country. However, there is an active voluntary sector providing carbon credits to projects to qualifying projects globally. The likely credit that could have been available to this project was quoted at up to $2/tonne. For a CO_2e saving of 12 million tonnes, this could have generated an additional $24 million/year.

CLIENT FEEDBACK

The project owner was pleased to receive this proposed solution and initiated a conceptual engineering study to determine how the proposed technology could be implemented.

[1] en.wikipedia.org/wiki/global_warming_potential