

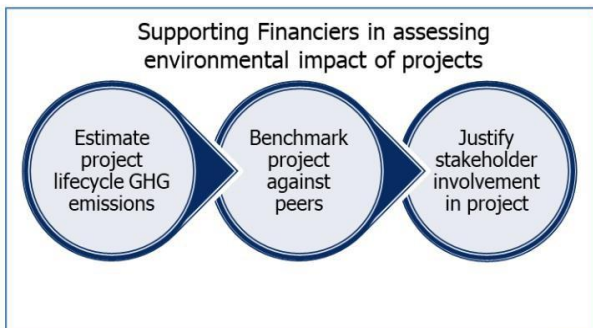
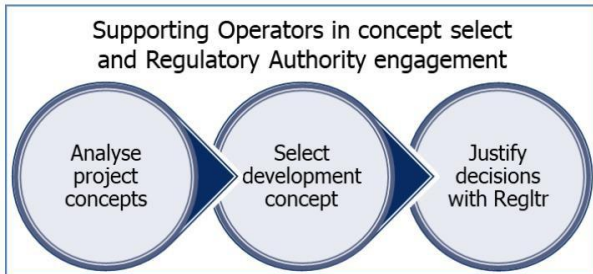


## Emissions Reduction and Benchmarking

**Meeting environmental objectives to reduce emissions on offshore energy projects by analysing and re-assessing concept design and existing operations.**

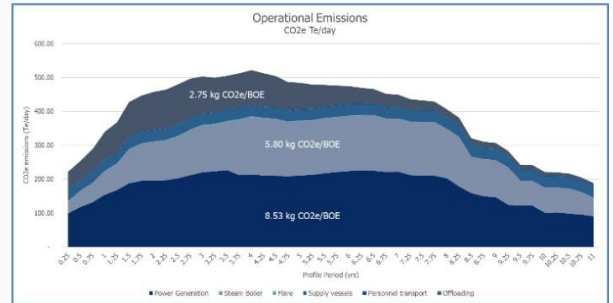
Regulatory compliance and increasing investor and stakeholder expectations requires operators to be conscious of and actively reducing the greenhouse gas (GHG) emissions for both new projects and existing facilities. Cron dall Energy uses its offshore design and operations experience to work with clients to minimise GHG emissions, in combination with the in-house **Z**ero **E**missions **T**racking and **A**ssessment (ZETA) tool.

ZETA enables Cron dall to assess the emissions across the complete lifecycle of a project, from construction through to operations and downstream use, and activities associated with decommissioning.



ZETA is a proprietary, in house tool developed on a framework for analysis created from globally accepted industry guidelines and datasets including API, GHG protocol and IPIECA. Data inputs for the tool include specific operator data,

project design information, vendor data and Cron dall Energy’s own inputs. The **ZETA** tool has been validated across multiple projects by environmental consultants, client reviews, reported emissions benchmarking and industry data.



### Our Service

Cron dall Energy is able to provide emissions analysis throughout the lifecycle of a project, benchmarking against other facilities and re-assessing the design through the lens of emissions reduction, highlighting emissions “bad actors” and providing technically suitable and cost-effective solutions. Cron dall Energy focusses on power generation optimisation and process heat design as the typically largest contributors to a facility’s emissions. KPIs are developed for setting emissions targets, as well as ongoing measurement and tracking through operations.

### Case Study

Cron dall Energy has recently completed multiple studies evaluating the GHG emissions for both new developments in the concept select stage, facilities under construction and operating facilities, on behalf of owners, operators and investors.

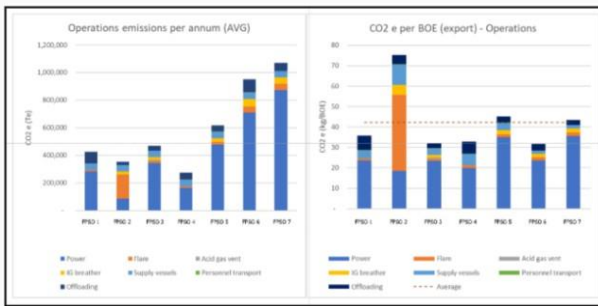
Providing a framework for measuring and reducing GHG emissions for both operators, owners and investors to support decision making for new developments and ongoing projects.



## Emissions Reduction and Benchmarking

### Case Study 1: Emissions estimate & benchmarking

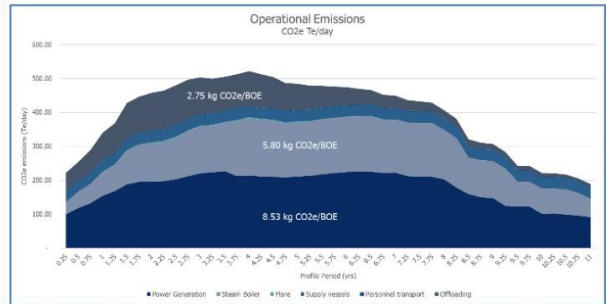
Cron dall Energy was engaged as Lenders' Technical Adviser (LTA) on behalf of a global consortium of banks and ECAs financing an FPSO development. Cron dall Energy reviewed the design of the facility against best practices and industry standards for emissions reduction, as well as benchmarking the facility lifecycle emissions against other regional and global comparable FPSOs.



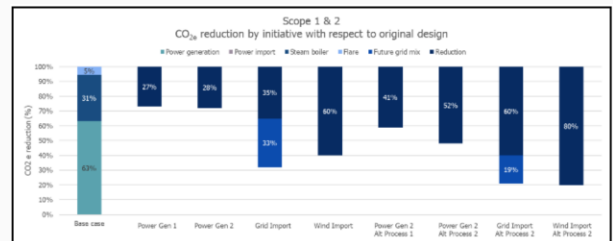
Estimation of the facilities emissions was carried out utilising Cron dall Energy's in-house **ZETA** tool, which can be used at any stage of the project or facility life cycle. Applicable Scope 1, 2 and 3 emissions were estimated using data from sources such as the project developer, design parameters, vendor data and Cron dall Energy's in-house data. The benchmarking comparison undertaken used Cron dall Energy's in-house database of FPSO GHG emissions and enabled a comparison to be made for the complete project lifecycle as well as for discrete components of the facility. This analysis enabled Lenders to have an independent GHG emission estimate as well as a comparison to other facilities, thereby providing the required inputs to develop KPIs for the financing of the development, as well as for future operational monitoring of the project.

### Case Study 2: Emissions reduction

Cron dall Energy worked with a client to develop a low emission concept for a North Sea oil field project and then submitted this to the OGA for approval. This was achieved using a multidiscipline engineering team from Cron dall Energy (from marine engineering to process and E&I designs), and the **ZETA** tool.



The initial GHG emissions estimate utilising ZETA, identified the facility as having a similar GHG emissions performance as other facilities in the basin. Cron dall Energy assessed the impact of alternative equipment and designs, focusing on field proven net zero solutions as well as emerging technologies.



The final concept selected utilised a combination of field proven technology to reduce emissions by over 50%, with the flexibility to allow for emerging technology to be incorporated in future.