HOW PFIZER LITTLE ISLAND ADDRESSED ENERGY EFFICIENT DESIGN IN A PROCESS COOLING STUDY

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Consulting Engineers Project Managers

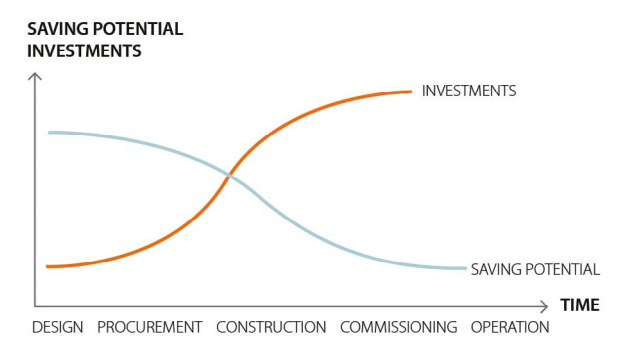
THE BUSINESS

The Pfizer Little Island site had a requirement to install a closed loop cooling water system. This would serve modern manufacturing processes, replacing an antiquated once through cooling water system. During the concept design discussions, Greenhouse Gas (GHG) emissions targets were raised as a concern, as any potential solution would have an adverse effect on CO_2 emissions.

The site decided to include energy efficient design into the design process in order to mitigate the project's impact on site emission levels.

THE DESIGN PROCESS

The most significant impact on a project is at the concept design stage. Therefore the site engaged with an Energy Efficient Design mindset from the outset in order to minimize the project's impact on the site's CO_2 emissions.



CONCEPT DESIGN:

Energy Efficient design requirements were included in the concept design discussions. This led to an understanding of the implications of various decisions on operating costs and CO_2 emissions. Initial options discussed included:

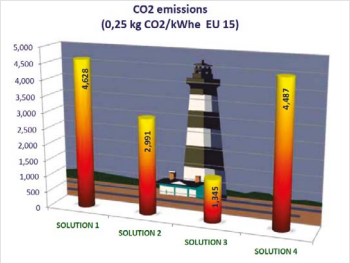
- Utilise the existing Low Temperature Methanol Cooling Water System operating at –19˚C (minimize capex but significant energy implications).
- Install a tempered loop from the –19˚C system and operate the tempered loop at 10˚C (large capex and large opex).
- Installing a standalone chilled water system with a dry cooler to avail of free cooling for significant parts of the year. (most desired solution from opex perspective)

The third option was selected as the desired solution to progress, meeting all stakeholder expectations.

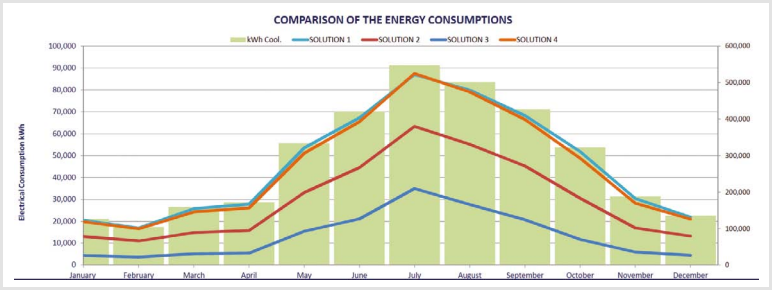
FRONT END DESIGN:

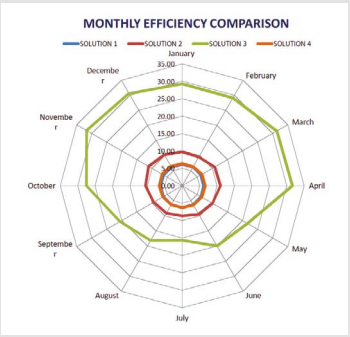
The Development CPA included for the appointment of an EED expert to challenge the design from an energy perspective throughout the process. This involved engaging with the appointed design engineers, O'Callaghan Engineering, to challenge the design to minimize the project energy impacts. Proactive engagement between the design team, the EED Expert and the stakeholders on site ensured that all elements of the design were challenged to minimize OpEx costs.

IMPROVEMENT OPPORTUNITIES CONSIDERED



- Challenge the source of cooling in the concept phase
- Understand the stakeholder requirements
- Challenge the temperature requirements for process
- Challenge the emergency cooling solutions
- Challenge the design calculations on actual cooling demand
- Completion of LCC analysis on the chiller selection process
- Challenge on the number and size of chillers including the requirement for N+1
- Challenged the need for antifreeze in system and insulation requirements in system
- Comprehensive metering of the system





IMPACTS AND BENEFITS OF THE EED PROCESS

- **Reduced system design load 4.2MW to 1.8MW** as a result of challenging the design calculations and utilizing operational data to adequately size the system.
- **Significantly reduced capital costs of €800k** due to smaller chiller and associated pipework.
- **Reduced operational costs of €200k** as a result of selecting a standalone system verses providing cooling from the –19˚C system.
- **Design team will proactively engage in the process** if it is included at the time of engaging the design team (too late once the design team are appointed).
- **No impact on the project timeline** as it was included in the developmental CPA.
- **Part funded by SEAI** to demonstrate best practice design.

"The energy efficient design process really challenged all the stakeholders in the design process, including production personnel, utilities department and the design team. thus delivering the most economically sustainable solution possible for the site"

DONAL O HERLIHY SITE ENERGY LEAD. PFIZER LITTLE ISLAND

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