Energy Performance Related Payments in Dublin Port Headquarters Retrofit Projects

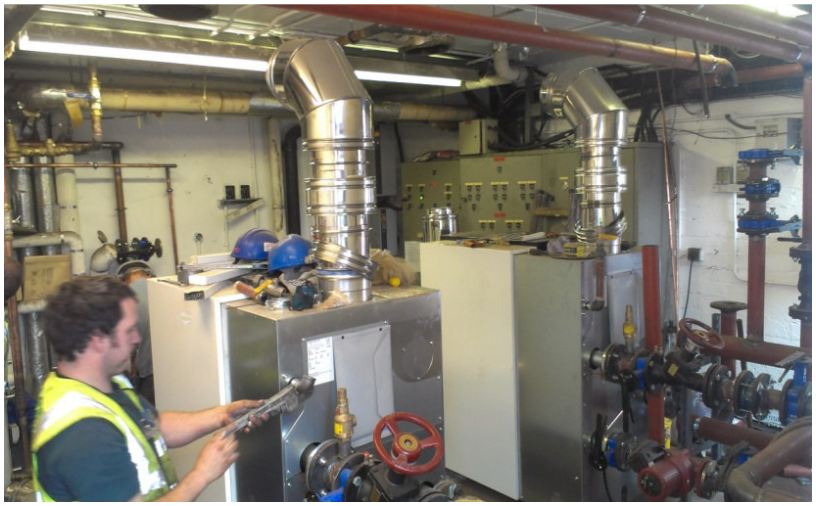
Crane lifts new boilers and microCHP to rooftop boiler house

Project Overview

Name of projects	Port Centre Boiler House Refurbishment Port Centre Ventilation Controls Retrofit
Client Name	Dublin Port Company
ESCOs	Consultant - PowerTherm Solutions Mechanical Contractor - T. Bourke & Co. Controls Contractor – Standard Control Systems
Year contract signed	2012
Type of facility	Office Building
Scope of works	<u>Boiler House Refurbishment</u> Remove 2no. existing oil-fired combi-boilers which were at end of life, LTHW pumps and pipework, MCC and controls panel and associated pneumatics. Install 2no. 286kW modulating and condensing gas-fired boilers; 4.5kWe/12.5kWth microCHP with condenser module and 1500 litre buffer vessel; LTHW pumps, pipework, valves and commissioning sets with lagging of same; DHW calorifier; new MCC and controls panel; extensive electricity, gas and heat metering; ancillary equipment. Develop advanced control strategies to: • maximise boiler efficiency using direct modulation and weather compensation. • use the CHP as lead heat generator, then charge the buffer vessels when there is no heat load, then discharge the buffer vessel when the heating is first started in the morning, whilst avoiding charging of the buffer vessel during the day. • use the CHP (and boilers if required) to maintain domestic hot water at temperature when there is no space heating load, whilst avoiding wasteful cycling or heat loss into the space heating circuits.

Port Centre Ventilation Controls Retrofit

- Remove the existing pneumatic controls for the Variable Air Volume (VAV) boxes in offices.
- Install BMS control units and electro actuators on the VAV boxes, and room temperature sensors.
- Whereas before office temperature control was erratic, each office is now monitored and controlled via the BMS, and the temperature control of the Main AHU can be harmonised with the requirements of the offices.



New condensing gas boilers and pipe work being installed

Energy Performance Related Payment

EPRP Overview

Boiler House Refurbishment

The consultant and the main contractor each guaranteed separately to the client that the project would achieve a 15% energy efficiency improvement in fossil fuel use. If this guarantee was not achieved, each would lose 7.5% of their respective contract values.

Port Centre Ventilation Controls Retrofit

Pain/Gain Share Arrangement – performance measured by evaluating electrical savings. If 100% of the target electrical kWh savings are achieved, the parties receive 100% of their respective fees. For each 1% of additional savings, the contractor will receive a bonus of 0.5% of their fee, up to a maximum of 5%. For each 1% savings fall short of target, the contractor will incur a penalty of 0.5% of their fee, up to a maximum of 5%.

Contractual arrangements for EPRP

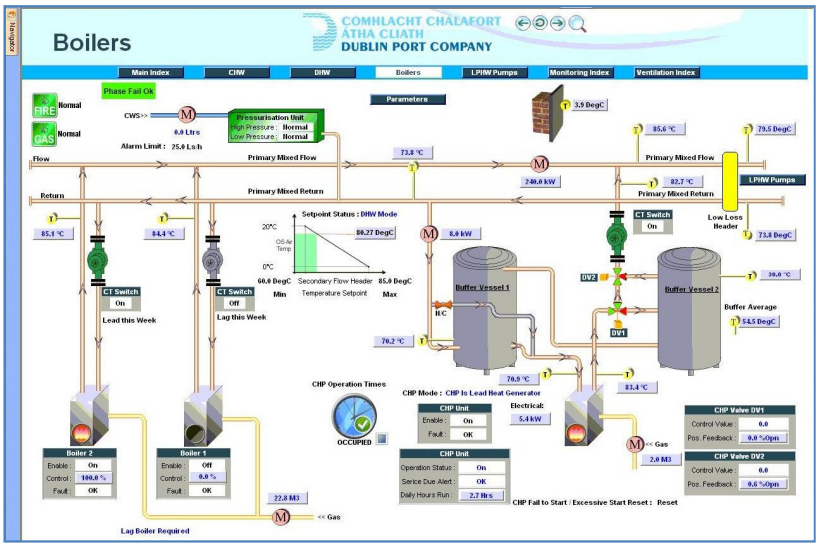
Boiler House Refurbishment

The standard NEC3 Engineering & Construction Contract was used in conjunction with DPC Health, Safety and Environmental requirements. In addition to the Works Retention of 5%, an Energy Performance Guarantee Retention (also a percentage of overall contract value) was included. A short attachment to the contract detailed the terms of this energy guarantee retention.

Port Centre Ventilation Controls Retrofit

As this was a smaller contract, a purchase order was issued to the successful bidder. The request for quotation documentation incorporated the terms of the pain/gain share arrangement.

Measurement & Verification of Savings	A M&V plan including baseline energy data was prepared by the consultant (a Certified M&V Professional) for each project. After several months it was demonstrated that savings from both projects were substantially in excess of the guaranteed amount.



Controls graphic illustrates the new installation and control

Procurement Process

Procurement process	Traditional public procurement. For each project bidders responded to a detailed Invitation to Tender specifying the works. Bidders were required as part of their submission to accept the terms of the performance guarantees.
Extent of survey analysis by all bidders	A brief explanation of the expected energy efficiency impact of the various works was provided by the design consultants in the ITT. Contractors surveyed the building to establish cost of works and satisfy themselves that the energy savings guarantee level was achievable.
Final award criteria	Accepting the performance guarantee was a minimum condition of all tenders. Cost, compatibility and quality of plant and equipment, contractor experience in similar projects, quality of tender documentation, HS&E standards.
Contract	

Project Viability

Cost of works	Circa €300k (ex. VAT) for both projects, including design. SEAI grant reduced the cost to DPC by 35%.
Projected Savings	Electricity 13% Gas 27% (degree day adjusted) Note that actual savings are higher than was projected.

Financing

Financing arrangement (debt and equity)	Client financed (with 35% funding from SEAI under BEW 2012 scheme).
Source of finance and rate of interest	n/a
Balance sheet allocation of debt	n/a

Other

Annual service fee	No
Allocation of energy price risk	n/a
Inflation	n/a