

# CASE STUDY

## FEASIBILITY STUDY – TRIGENERATION AT NEWCASTLE CIVIC CENTRE AND NORTHUMBRIA UNIVERSITY

### BESPOKE DESIGN

Each installation is designed to meet specific client requirements with full computer simulation used to prove all designs.

### ENERGY EFFICIENCY

As approved Carbon Trust Consultants, we will ensure that the system energy performance is optimised to produce lower operational costs.

### PROJECT CDM AND MANAGEMENT

Our engineers and consultants will ensure that all aspects of the design and installation are fully compliant and all relevant permissions and safety requirements are fully adhered to.

### MCS ACCREDITED

ESP is an accredited installer, approved under the Government's Micro-generation Certification Scheme.

### CARBON TRUST

ESP are approved Carbon Trust Energy and Biomass Consultants.



- Feasibility assessment to determine technical and financial viability of tri-generation scheme
- Preliminary design based on gas-fired CHP and LTHW absorption chiller
- Lifecycle analysis for financial and carbon savings
- Estimated carbon savings of up to 1280 tonnes per year and financial savings of around £155,000 per year

Newcastle Civic Centre is the headquarters for Newcastle City Council, and, although used primarily as office space for Council employees, the site is also home to a number of computer suites, IT server rooms and a telephone exchange. The Northumbria University campus is located across the road from the Civic Centre, and includes a large computer suite within the Northumberland Building.



ESP was asked to assess the technical and financial viability of installing a tri-generation system serving the Civic Centre and the nearby Northumbria University computer suite, which would provide heating, cooling and electricity.



An audit of existing energy use was undertaken, with base thermal, cooling and electrical loads assessed, and existing plant identified. It was concluded that a tri-generation scheme based on a gas-fired CHP and a low temperature hot water absorption chiller would be both technically and financially viable, and could reduce annual energy expenditure by around £155,000 and annual carbon emissions by up to 1280 tonnes.



A preliminary design was done, and under this design, it was proposed that a new CHP engine would provide the base thermal and electrical loads for the Civic Centre and would also supply heat to an absorption chiller. This chiller would utilise this thermal energy to drive a cooling process, with the resulting chilled water providing cooling to the server rooms in the Civic Centre and the computer suite at Northumbria University.



CHP and tri-generation systems can deliver significant cost and carbon savings compared to the conventional mix of gas heating, grid electricity and electric-powered air conditioning. Overall energy efficiency is greatly improved through a combination of simultaneous generation and the use of the energy near to the point at which it is generated.



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