CASE STUDY: Bankside Modernisation / Heat Re-claim Scheme

SECTOR TYPE: Infrastructure – Electricity/Substation Modernisation – waste heat reclaim

LOCATION: Bankside, London SE1

CLIENT: UK Power Networks

PRINCIPAL DESIGNER: Arups

PRINCIPAL CONTRACTOR: Wilson

The Project

The Bankside substation supplies electricity to a major part of the City and Southwark areas. Arup developed a solution that would not only meet UK Power Networks' brief to renew and improve the efficiency of the energy infrastructure, but that would also provide zero-carbon heating to Tate Modern.

The £61 million upgrade of Bankside substation was a key part of UK Power Networks' central London strategy, and its network renewal programme. The substation needed upgrading to replace obsolete equipment, improve efficiency, add extra capacity and improve resilience. Meanwhile, at the Tate Modern, an extension to the main gallery building is underway. The two projects teamed up to create a zero-carbon source of heating for the new building.

The heat produced by the transformers in the substation – a natural consequence of changing the voltage of the electricity – was previously wasted. With such a large substation in an area with a strong demand for heat, it made environmental and financial sense to reuse it.
The Benefits

- **Environmental aspects** – As the first project to reclaim waste heat at a major UK substation, this solution means that the Tate Modern extension exceeds the planning requirements for 10% of a building’s energy needs to be met by on-site renewable technologies.
- **Social aspects** – Tate Modern is the most visited gallery in London with 3,958,026 visitors per year. The Olympic games in 2012 will boost visitor number with large international audience. Visitors will be made aware of the nature of the heat reclaim scheme.
- **Economic aspects** – The heat reclaim scheme will generate enough heat for the whole Tate Modern extension project, saving around £5 million over the life of the building.

End User Feedback

This project is the first of its kind at a major UK substation and we may soon see other substations putting waste heat to good use.

The Process

- **Environmental aspects** – With two large independent projects taking place within the same area regular meetings were held between project teams. Open and frank discussions between parties identified mutually beneficial schemes and the heat reclaim project evolved in this way.
- **Social aspects** – UK Power Networks is not currently an ‘energy supplier’. Although energy meters were installed by both UK Power Networks and Tate Modern there are currently no plans to charge for the energy usage.
- **Economic aspects** – The project was financed as a research and development project which is encouraged by Ofgem and the lesson learnt will enable similar re-claim schemes to be implemented elsewhere.

Key Learning Points

A heat reclaim scheme was not considered at the beginning of the project due in part to being focussed on other objectives. During this time environmental and social considerations had become more relevant.

During the detailed design phase the transformer cooling arrangements were changed to oil/water/air. This made it viable to reclaim the waste heat from the water system.

The major lesson learnt is that you need to continually re-evaluate options as situations/regulatory framework change.

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