sse
Energy Solutions

SSE's Heat Network Decarbonisation and Expansion at Royal Woolwich Arsenal

Key points

450 homes - original capacity
Over 5000 properties - current capacity for decabornisation plan
12MW boiler capacity
1.1MWe CHP
70m3 thermal store

Working closely with our client, Berkeley Homes, this is a prime example of how a heat network can be designed for site expansion and decarbonisation whilst focussing on keeping costs for customers as low as possible.

Our work at this site has seen the heat network plant and equipment enhanced and expanded from its original capacity for 450 homes to a decarbonised solution for over 5,000.

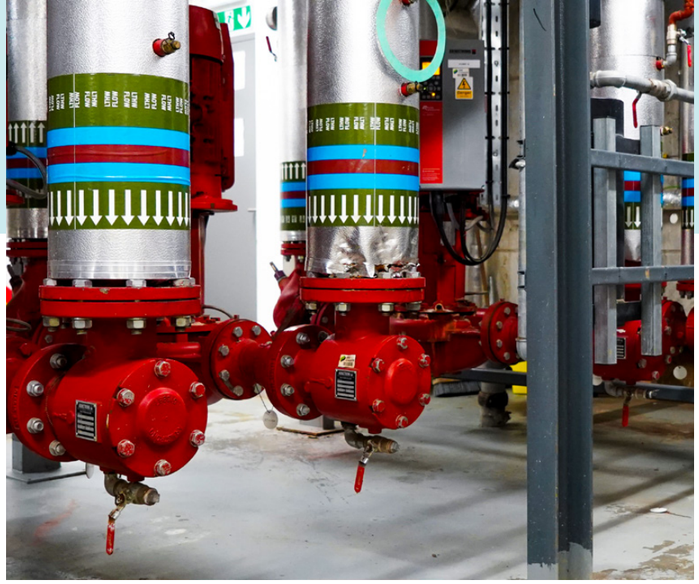
This is an excellent example of collaborative working enabling the ongoing expansion and decarbonisation of an expansive heat network.

Berkeley Homes has shown its confidence in SSE to manage and deliver this expansion through several contract extensions. The Energy Centre equipment was originally sized to provide heat and private wire electricity to 450 residential and commercial customers from a gas CHP and gas boilers. SSE took the role of Principal Designer and Principal Contractor for the works within the energy centre together with installation of heating pipes and the private wire electricity network.

The private network

The private wire network installed at the time of development provided a cost-effective installation solution during the early phase of the development. It is fully integrated into the local distribution network and compliant with all current regulatory requirements, offering residents regulatory protection and guaranteed service standards.

SSE kept complete responsibility for supply continuity for our customers throughout



Site expansion and adoption

The scale of the project and heat demand for the energy centre has grown significantly since the original planning was granted. In 2013, planning permission was granted to expand the site to up to 3,800 residential units This necessitated a significant increase in plant capacity whilst working within the same energy centre building footprint. SSE led the design process to make maximum use of the vertical height available in the energy centre. Two new mezzanine floors were designed, necessitating significant structural works to the energy centre. 12 MW of boiler capacity was designed to be installed on the first of these new floors together with a new 1.1MWe CHP at ground level. The existing 70m3 thermal store was suitable for the expansion works and could therefore stay in situ.

As well as ensuring the design was optimised from a performance point of view, SSE was able to ensure efficient plant sizing based on known and forecast energy demands from the site. SSE takes plant capacity risk and we were able to ensure that no surplus plant “headroom” was installed, thus reducing capital costs for our client as well as lowering ongoing operating costs and therefore customer tariffs.

SSE also ensured full operability and plant replacement strategies were developed and incorporated into the design. The result is an energy centre which is designed to be safe and efficient to maintain. A practical example of this is the new, vertically extended louvres which were installed in the energy centre shell to enable simple plant replacement when large pieces of equipment reach the end of their working lives.

Construction of the works commenced in 2015. SSE took the Principal Contractor role and, working with our subcontractor, we oversaw the complete package of works (including civil structural and M&E) as well as new utility connections to the energy centre building. One of the crucial elements of the works was the changeover of heat supplies from the energy centre to a new temporary energy centre and back again on completion of works.

Decarbonising for the future

In 2020, a further expansion of the project was tabled by Berkeley Homes. This time, a lower carbon energy source was required to enable new phases to achieve the tighter carbon standards set out in Building Regulations and planning requirements. SSE assessed a number of low carbon electrified energy sources, including waste heat, ground, river and air source solutions.

For each assessment, capital cost, plant efficiency, customer tariffs, reliability and deliverability were key considerations. Ultimately, SSE and the Berkeley project team settled on an Air Source Heat Pump (ASHP) solution and assessed a number of potential locations for the plant to minimise the impact on residents. The design was such that 70% of heat will be met by the ASHP. SSE carried out the detailed technoeconomic modelling to inform the design solution and ensure this target could be met.

Cold air plumage and noise were carefully assessed and a satellite energy centre location was chosen with an innovative design led by the SSE team to minimise the impact of both.

The handover process was controlled and phased

Contracts were amended and extended to facilitate this retrofit work which will take place in 2025. We believe this is an excellent example of decarbonisation of existing heat network infrastructure whilst maintaining value for money tariffs and service guarantees for customers.

Adopting the infrastructure

SSE has well over a decade’s experience in adopting heat and cooling network infrastructure and we bring this experience to all projects with the focus on clarity, simplicity and certainty for all parties.

At Woolwich Royal Arsenal, for all works outside the energy centre, we follow our tried and tested approach to asset adoption. Berkeley and its supply chain design and construct to a specification provided by SSE which is included in the Concession Agreement and flowed down into Berkeley’s supply chain requirements and contracts.

We provide dedicated resources (a project, technical and commissioning manager) and a single point of contact to support the client’s on site teams throughout the construction process to ensure smooth and timely handover of assets on completion.

Key aspects of SSE's approach

Key aspects of our approach at this site (which are mirrored across our portfolio include):

- Early kick off meeting for all parties to meet and establish appropriate contact points
- Develop a shared understanding and agreement of SSE's role in the process
- Development of a co-ordinated approach to snagging - typically we find a single shared snags list, which is a controlled document, usually owned by the Owners Engineer role, to which SSE has access and can add comments, is the most effective approach here
- Gain shared understanding of programme and milestones towards Sectional and Practical Completions

We provide clear documentation to support the asset handover process and work closely with client and their contractors to ensure works on live and adopted networks are carefully managed to ensure that customer supply security isn't compromised.

Our operation and maintenance programme

We are conscious of the impact that having one supplier of heating and cooling can have for our customers. Our operations and maintenance programme is tailored to maximise site uptime, which reduces customer complaints and in so doing minimises negativity.

An experienced technical team is responsible for managing our Operations and Maintenance contractor base. Where we do subcontract works, all contractors are subject to monthly quality meetings at the very least. SSE has contracts in place for a large number of different types of needs, meaning our experience can flex with new requirements.

Carbon savings

When the new ASHP is installed in 2025 we expect a saving of approximately c2,000 tonnes (using current grid carbon factors) per year when fully operational.

The BMS helps us to identify issues with the system before it becomes an issue for our customers

The focus of our contracts is, of course, to maximise the uptime of the operation. Each site has a Buildings Management System (BMS) to support this. The BMS helps us to identify issues with the system before it becomes an issue for our customers. Each site has an experienced, nominated supervisor who is involved in the commissioning process to be completely familiar with the site ahead of its day-to-day operation meaning that we hit the ground running.

Metering and billing

Our Customer Service team at Woolwich employs a Metering Co-ordinator whose role is to ensure that the metering system has been set up properly at the outset and is reliable throughout the adoption of each phase, ensuring a high degree of accuracy for customers' heat meters.

After handover, our Metering Co-ordinator works with the developer to iron out any issues raised by customers relating to metering issues. This is part of our ongoing duty of care that ensures that we comply both with the Metering and Billing Regulations (2014) and the Heat Trust's regulations.

We encourage the facility to split various components of the bill and send separate bills to relevant parties (where the landlord is a social housing association) when liability to pay the bill is shared.

AMR (Automated Meter Reading) means that the bills are always the most accurate consumption data available. If no metering data is available either by electronic or manual reads then the billing system will prepare an estimated bill based on historical usage. A direct debit payments summary is sent to the customer every six months.

For social housing tenants we can bill a proportion of the Standing Charge to the Housing Association (to be agreed with the social housing provider, typically 70%) with the tenant only picking up a smaller element of the fixed charge.

Customer Care

Customers at our Woolwich site enjoy the same high levels of service and Heat Trust protection as customers across our heat networks portfolio. This includes regular face to face customer engagement days as well as support from our dedicated and highly skilled customer service teams.

We believe our customer service is second to none in the sector, with our modern and flexible billing engine, multiple routes for customers to contact us and pay their bills, sensitive approach to debt management and extensive use of social media we put the customer at the heart of what we do.

Designed to meet local energy needs and drive Net Zero

Smart distributed energy infrastructure solutions

SSE Energy Solutions is part of SSE plc, a UK based FTSE 100 company with 75 years' experience operating in the fast-changing energy industry. SSE Energy Solutions plays a major part in the emerging consumer-led energy system, and provides key services to enable users to benefit from new ways to optimise and manage their low carbon energy use.

Our Distributed Energy business teams adopt a whole system approach by investing in, building and connecting your localised, flexible energy assets to accelerate your path to net zero and create a more resilient energy system for the long-term.

Right now, your decision to pick SSE Energy Solutions, part of an established renewable energy company investing in all our futures, will be the right choice for you and for our environment.

Let us tell you how we can support your journey

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