

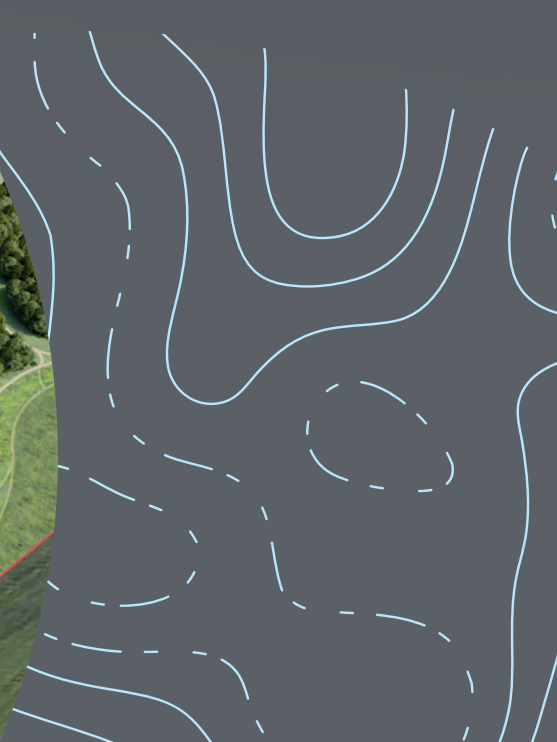


The Coal
Authority

Seaham Garden Village mine energy district heating scheme

Creating a better future for people and the
environment in mining areas

#CleanEnergyFromTheCoalfields



Key stakeholders



The Coal
Authority

The Coal Authority is a non-departmental public body and a partner organisation of the Department for Business, Energy and Industrial Strategy (BEIS). They have expertise in managing the below ground abandoned mine infrastructure and its surface impact, whilst operating an increasing portfolio of 75 mine water treatment schemes. It is pioneering the advancement of the use of former coal mines as a source of geothermal energy, water for cooling and for large scale inter-seasonal energy storage in abandoned mines.



Tolent was formed in Tyneside in 1983. Since then they have amassed a huge variety of projects encompassing all types of building and civil engineering work in the public and private sectors. One of Tolent's greatest strengths is its versatility which enables them to deliver efficiency and excellence in projects of all sizes, whether they're repair works valued at £5,000 or a £90 million contract for a flagship development.



Durham County Council is a 'unitary' council, accountable to nearly 520,000 people in County Durham. They provide a wide range of public services to all parts of the county to meet the needs of their residents and help everyone in County Durham to achieve their ambitions. They work with a range of partners to provide their services in the best possible way and represent and promote the interests of County Durham when dealing with regional, national and international affairs.



Seaham Garden Village

A great place to live

In partnership with Durham County Council, and the Coal Authority, Tolent Construction are developing an exemplary Garden Village at Seaham, County Durham, with an investment of £175 million.

Having received Garden Village status in early 2019, the development will start construction early 2020.

It will be made up of 1,400 homes, a primary school, shops and an innovation centre. It will provide an attractive place to live, that nurtures its residents' well-being from early years through to retirement.

Low carbon district heating

This development has the potential to make Seaham Garden Village the first large scale mine energy district heating scheme in the UK.

Seaham Garden Village is to be built immediately adjacent to the Coal Authority's Dawdon mine water treatment scheme. This scheme protects vital drinking water abstraction from Durham Magnesian Limestone, and pumps 100 to 150 litres of mine water per second to the surface for treatment.

This mine water is warmed by geothermal processes to provide a continuous supply of water at 18 to 20°C.

With mine water temperatures unaffected by seasonal variations, there is a potential 6MW of low cost, low carbon sustainable energy available for local space heating use from the Dawdon treatment scheme all through the year.



The next chapter in our mining heritage

The Coal Authority is advancing plans to convert the UK's abandoned coal mines from a liability to an asset of strategic importance to the UK, tackling climate change, providing cheap sustainable energy and building stronger communities.

Geothermal mine energy

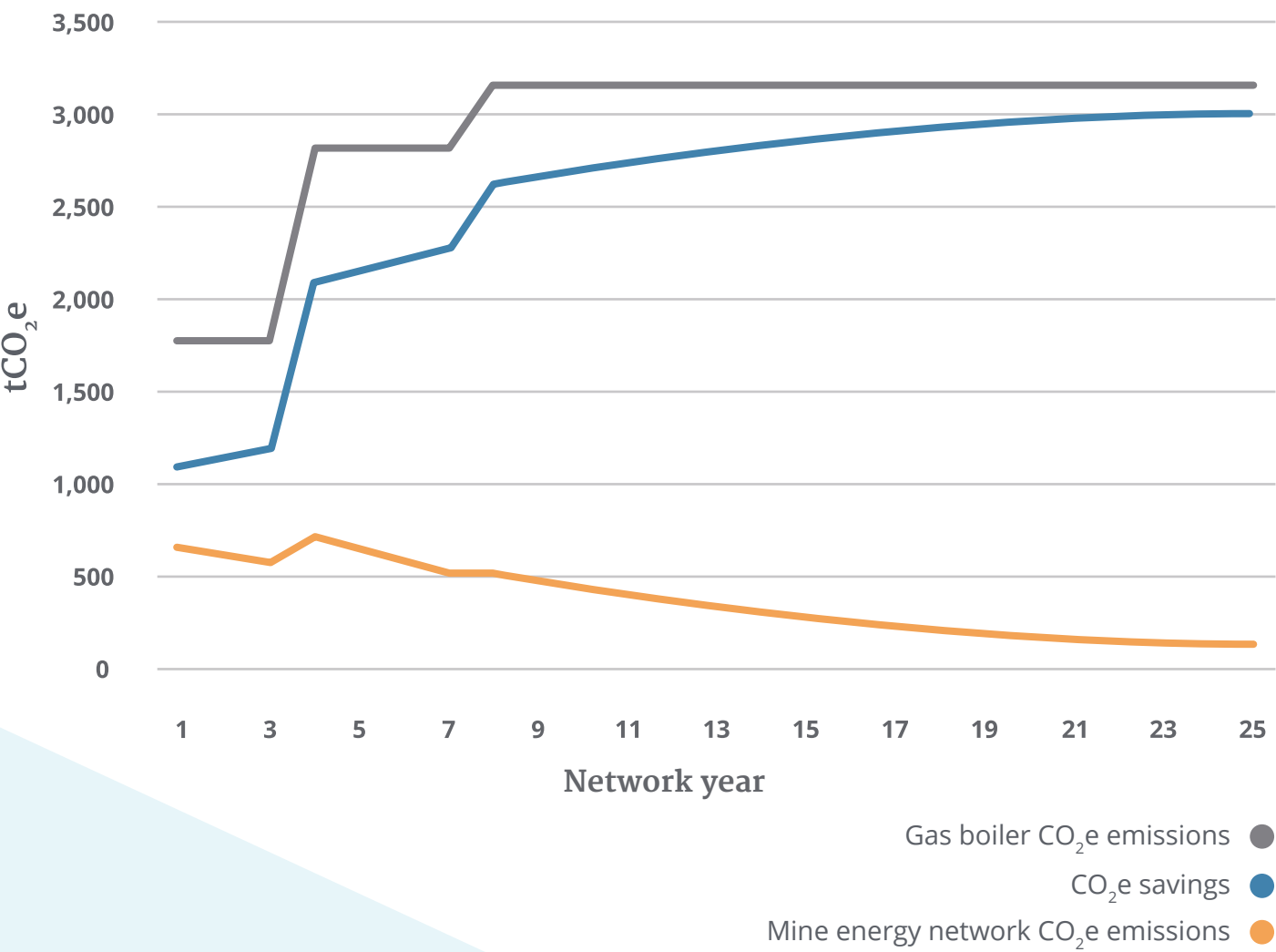
Heat will be abstracted from mine water using highly efficient water heat pumps where every 1kW of electricity used produces 4kW equivalent of heat energy, but, unlike air source heat pumps, there is no seasonal degradation on efficiency.

Mine energy attracts the Renewable Heat Incentive subsidies for geothermal energy and the scheme is awaiting formal notification of its Heat Network Investment Programme funding application submitted to round 3 (late 2019).

A Heat Network Development Unit technical economic feasibility study has been completed. Using electricity from the grid to power heat pumps significant carbon savings are anticipated using the warm mine water, see table.

It is also planned to explore using renewables at the site, such as solar PV to reduce the carbon footprint to nearly zero.

Seaham Garden Village mine energy district heating scheme carbon intensity comparison against gas



Dawdon mine water treatment scheme

Dawdon is just one of 75 mine water treatment schemes across the UK that the Coal Authority operates. In total these schemes release circa 100MW of geothermal energy to the atmosphere that could be used for heating purposes.

Flooded abandoned coal mines have water temperatures ranging from between 11°C to over 40°C depending on depth and geology. Combined with the ability to use mines for cooling and inter-seasonal storage of energy, they could provide all of the future space heating

and cooling requirements for the coalfield communities.

25% of homes and businesses in the United Kingdom are in the coalfields and 9 of the 10 largest UK urban areas are over or adjacent to abandoned coal mines. This means that the Seaham Garden Village scheme has the potential to pave the way for the large scale proliferation of mine energy district heating schemes across the coalfield communities.



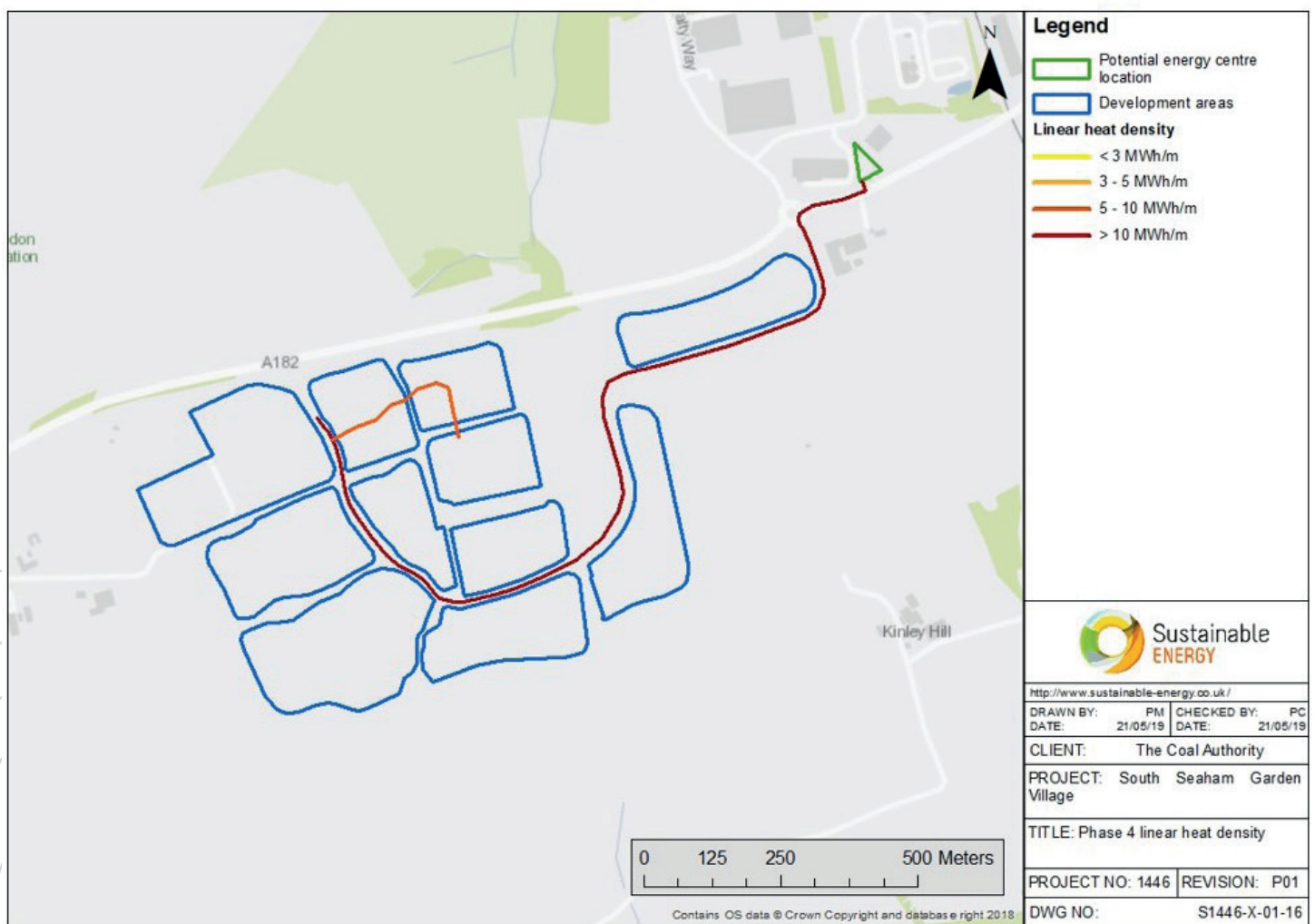
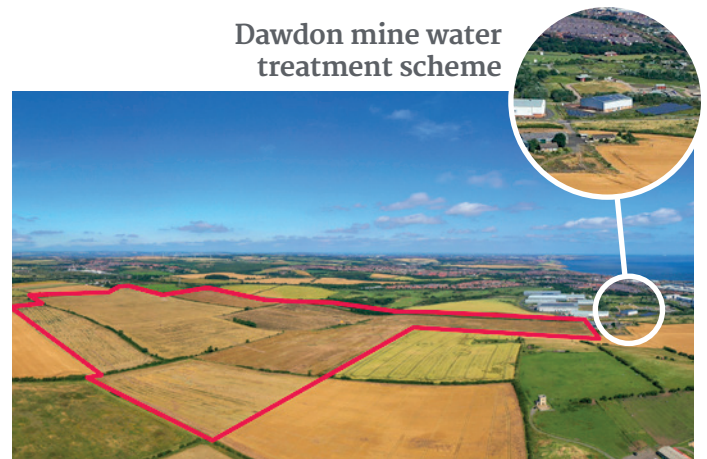
The development

District heating network

The development will be made up of 750 affordable homes which will act as the district heating anchor load. There will be an additional 750 private homes, a primary school, shops and innovation centre.

The planned district heating network will provide heating across the development anticipated to be below public supply prices at a fraction of the carbon footprint of gas heating.

Dawdon mine water treatment scheme



The partners

District heating network

Tolent Construction, Durham County Council and the Coal Authority are committed to creating an exemplary development at the Seaham Garden Village that truly enriches the lives of its residents, providing a spacious green environment that will build a sustainable community of the future.

Supply chain opportunity

These key stakeholders are seeking engagement with the supply chain to shape the procurement process to assist in delivering a sustainable district heating scheme at the Seaham Garden Village.

The scheme offers a number of potential resilience opportunities including:

- Garden Village status
- access to a low carbon sustainable energy source
- a continuous supply of low cost sustainable geothermal energy
- solar PV and battery storage potential to deliver a virtually zero carbon footprint district heating scheme
- potential for further sustainability opportunities such as vertical farming and horticulture

For more information contact:

mineenergy@coal.gov.uk

0345 762 6848

www2.groundstability.com/seaham

