

A Guide to the Barking Town Centre Energy Action Area



Front cover photo of Barking Power Station © Jim Byrne, QAPhotos
Back cover photo of vertical wind turbine © Quiet Revolution Ltd.

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1. What is Barking Town Centre Energy Action Area?

Global climate change is already occurring and temperatures are predicted to rise by a further 5 °C during the next 100 years. Some parts of the world will experience climate change through severe flooding while others will suffer droughts or a significant cooling down. Whatever the manifestations, climatic change will have a huge effect on the world's economy, societies and wildlife.

Climate change and energy policy have a particularly high profile, and both central and regional government are prioritising measures that reduce carbon emissions. The Department for Communities and Local Government (DCLG) recently announced that it intends for Thames Gateway developments to be low carbon. In addition, the Mayor of London has announced that when the London Plan is reviewed in 2007, it will include a requirement for all new developments in London to reduce their carbon emissions by 20% through the generation of on-site renewable energy.

Barking and Dagenham Council is committed to tackling the borough's contribution to climate change and produced a Sustainable Energy Strategy for Barking and Dagenham in 2005 to this effect. One of the issues this energy strategy tackles is the reduction of carbon emissions from the 25,000 new homes planned in the borough over the next 20 years.

As part of this agenda, the Council is working in partnership with the Mayor of London to achieve the low carbon regeneration of Barking Town Centre under the Energy Action Areas programme launched by the Greater London Authority (GLA) in summer 2005. Barking Town Centre is a major regeneration area in the borough with approximately 7,000 new homes planned over the next 15 years.

An Implementation Plan for Barking Town Centre Energy Action Area sets out a strategy for reducing carbon emissions generated by new developments by one third compared to emissions generated by developments built to current building regulations. This will translate to a carbon dioxide saving of 6,590 tonnes per year.

These carbon savings will be achieved through the connection of new developments to a town centre community heating network - also known as district heating - and on-site generation of electricity by renewable energy technologies such as small-scale wind turbines and photovoltaics (PVs).

2. What does the Barking Town Centre Energy Action Area mean for new developments?



Barking Town Centre Energy Action Area

New developments (housing, offices and retail uses) in Barking Town Centre are required to achieve a 32% reduction in carbon emissions on top of what is required of them by Building Regulations 2006. Developers can meet this target by:

- n Achieving a 22% reduction in carbon emissions by connecting to a planned town centre community heating network served by a low carbon heat source;
- n Reducing carbon emissions by 10% through on-site electricity-generating renewable energy technologies such as small-scale wind turbines or PVs (this 10% carbon reduction should be additional to any renewable energy generated to meet Building Regulations 2006).

3. What kind of community heating network is being proposed?

There are three main components to the community heating system proposed for Barking Town Centre:

- n A low carbon heat source;
- n A town centre heat distribution network;
- n Local communal heat networks in each development and end-user units in each dwelling.

A low carbon heat source

The low carbon heat will come from one of two potential sources. The first is Barking Power Station which, as all power stations, produces a large quantity of low grade heat as a waste product - some of this heat is readily available although modifications would be needed to obtain larger quantities.

The second potential source is a new combined heat and power (CHP) plant that would have to be built on the edge of the town centre and fuelled by waste from the Jenkins Lane Mechanical Biological Treatment Facility operated by Shanks East London.

Both these low carbon heat sources can reduce the carbon emissions of buildings that connect to them by 22%. If heat is brought from Barking Power Station via a large transmission pipe, Barking Town Centre will be one of a number of regeneration

areas served with low carbon heat - all the new housing planned for Barking Riverside, South Dagenham and Thames View can also be supplied when these areas are redeveloped. The London Thames Gateway Development Corporation (LTGDC) plans to commission an options appraisal to find the best route for this transmission pipe.



Barking Power Station © Jim Byrne, QAPhotos

A town centre heat distribution network

The heat distribution network will be developed and expanded over time. It is likely that isolated heat networks served by interim natural gas boilers will be developed first, and joined up into a town centre network at a later stage. When this happens, the interim boilers will serve as top-up



or standby boilers for the town centre community heating network.

These boilers will either be centrally located to provide heat to a number of new developments as they come on stream, or be site specific. The Council is undertaking the technical design of the community heating network and preparing the interim boiler strategy.

The distribution network will consist of pre-insulated pipes, or heat mains, that are buried in the ground in a similar way to gas or water mains.

The Council intends to set up a Barking Town Centre Energy Services Company (ESCO) to deliver the construction, operation and maintenance of this distribution network, and is commissioning financial experts to develop the business model for the ESCo.

Local communal heat networks in each development and end-user units in each dwelling

It is imperative that developers install communal heating in their buildings to ensure they can connect to the low carbon community heating network when this is built. Communal heating

refers to a centralised heating system rather than individual boilers in each dwelling.

Developers should work with the Council at first, and with the Barking Town Centre ESCo when this is set up, to design and build communal heating networks in their developments. In particular, developers should discuss boiler plant specifications and the proposed site of the plant room with the Council/ESCO, as this should be in the most easily accessible location to the developing town centre network.

The technical design of the community heating network will provide technical guidelines for developers which must be followed to ensure the standardisation of specifications across the network.

Homes connected to the community heating system will have the same components to those that exist in conventional gas-fired systems, such as pipework, radiators, hot water-storage, thermostatic and time controls.

The main difference from the residents' point of view is that they will have a consumer interface unit instead of a boiler. This interface unit looks similar to a conventional boiler and is operated in a similar way. It will be the developers' responsibility to install these units which must be metered.

4. Is community heating reliable?



E2's Avedor power station close to Copenhagen produces 20% of the electricity required by the region of eastern Denmark, and 40% of the heat demand for the city. Two major transmission pipes carry heat to 200,000 homes.

© Greenpeace/ Reynaers.

Yes. Community heating systems are governed by numerous European standards and have a service life in excess of 30 years. Modern, well-managed and maintained systems are very reliable and are widely used in Scandinavian countries.

In Denmark whole cities and small rural towns are served by community heating utilising a range of different fuels including gas, straw, waste wood, municipal waste and biogas.

Copenhagen has one of the world's largest district heating systems, supplying heat for a floor area of around 50 million square metres. The transmission system connects four CHP plants, four waste incinerators and more than 50 boilers to more than 20 distribution companies (ESCOs).

These initiatives have led to the reduction of space heating requirements in Denmark by 50% since 1973.

5. What will community heating mean for future residents?



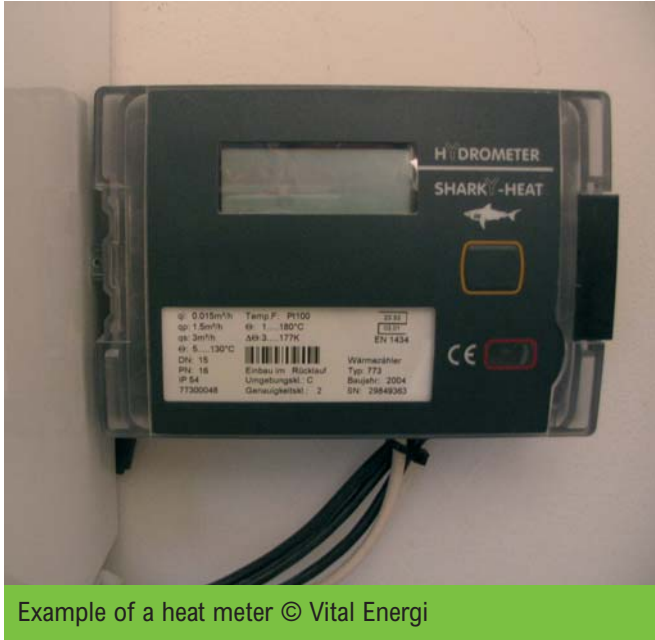
Example of a consumer interface unit without and with cover
© Vital Energi



The only difference future residents will notice is that they will have a consumer interface unit instead of an individual boiler. This unit will normally take less space than a boiler and does not require a flue pipe or any gas connections. These systems can be controlled in a similar way to conventional systems, which include room temperature, hot water temperature and timer controls for heating and hot water.

Community heating is a flexible approach to providing heating. The centralised fuel source can be changed without having to undertake any other alterations to the network or individual dwellings. Therefore, the town centre heating system will be able to switch to the cheapest or most environmentally-friendly fuels in the future - an important capability considering the uncertainty of future energy supplies.

6. Who will future residents pay their heating bills to?



Example of a heat meter © Vital Energi

Future residents will pay their heating bills directly to the Barking Town Centre ESCo when this is established. In the interim period, it will be the responsibility of the managing agent of each development to operate the communal heating system and charge for the heat. Managing agents have the option of outsourcing this service to specialist companies.

Developers must install heat meters in properties as paying for heating through service charges does not promote energy efficiency. Heat meters work in a similar manner to electricity meters. They record the kWh of heat used by the property and customers are charged only for the heat used.

7. Why does the 10% renewable target have to be met through electricity-generating renewable technologies only?



© Proven Energy



Building integrated photovoltaic panels and small-scale wind turbines

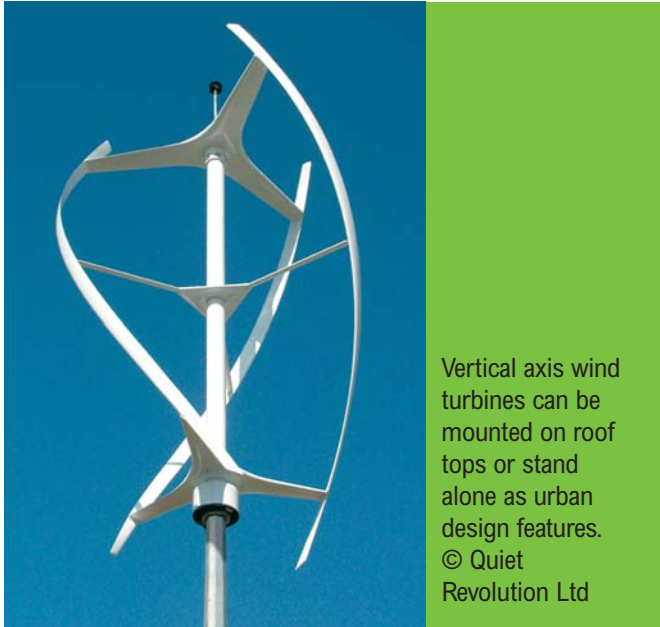
In accordance with the London Plan and Barking and Dagenham's planning requirements, new developments in the borough must reduce their carbon emissions by 10% through on-site renewable energy generation. This 10% renewable target is additional to any renewable energy developers may already be generating to meet Building Regulations 2006.

However, the community heating network planned for Barking Town Centre Energy Action Area is only compatible with electricity-generating renewable technologies. Heat-generating renewable technologies such as solar thermal will not contribute any carbon savings because low carbon heat is already provided through the community heating network.

Available electricity-generating technologies which developers can use in Barking Town Centre are:

- n Small-scale wind turbines;
- n Photovoltaic panels (PV)

8. What happens if developers can not meet the 10% renewable target due to physical constraints?



In exceptional circumstances, where developers can prove that physical constraints prevent them from generating electricity on site to reduce their carbon emissions by 10%, a financial contribution will be required. This financial contribution will be invested by the Barking Town Centre ESCo into electricity-generating renewable technologies on public buildings in the town centre, in a way that benefits the local community.

9. What are the requirements for passive solar design and increased energy efficiency?



The Millenium Centre in Eastbrookend Country Park, Barking and Dagenham, is an example of an energy-efficient building with PVs and a wind turbine.

Building Regulations 2006 have substantially improved the energy efficiency of new buildings. Furthermore, the community heating network proposed for Barking Town Centre will provide low carbon heat to developments. These two factors combined mean that further improvements to energy efficiency which go beyond Building Regulations 2006 will not be required.

All developers are required to design their buildings for maximum light and heat gain, and also include passive cooling techniques to avoid overheating in the summer.





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