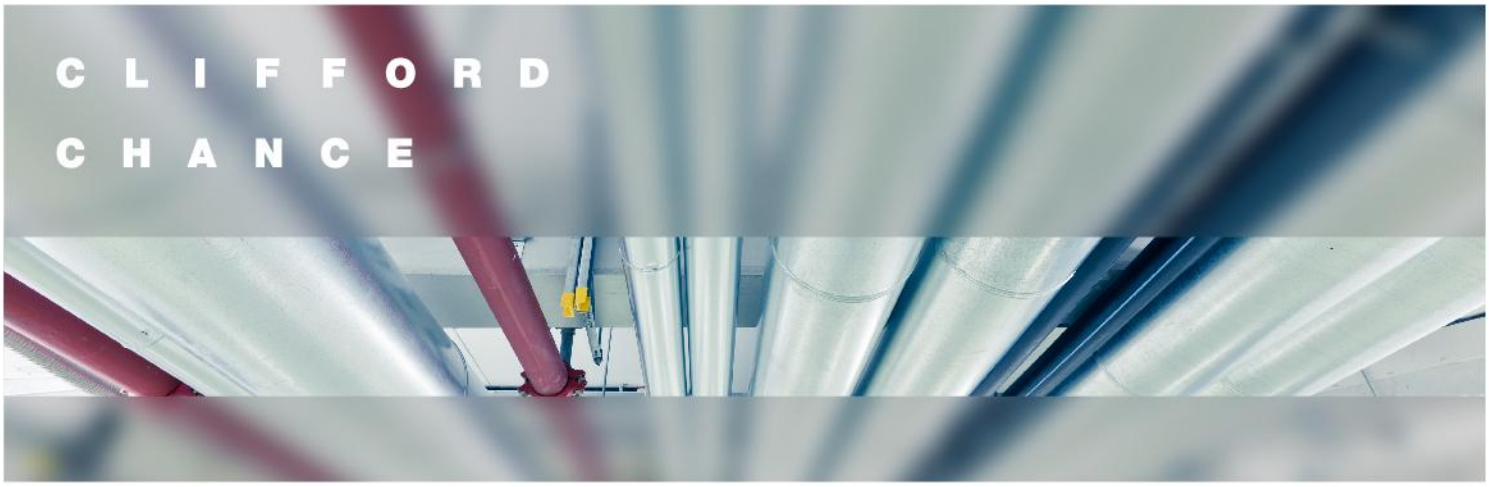

DEVELOPING DECENTRALISED ENERGY SYSTEMS FOR URBAN REAL ESTATE SCHEMES

New urban real estate developments are increasingly sourcing their energy from decentralised energy systems rather than from connections to the national grid networks. This briefing sets out some of the key features and legal and regulatory issues involved with the creation of decentralised energy systems for real estate schemes.

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FEATURES OF DECENTRALISED ENERGY SYSTEMS

Decentralised energy systems can be run independently of traditional gas and electricity grids. Their common feature is the inclusion of an energy centre, typically using combined heat and power (CHP) technology (see Box inset), to generate the required power and heat. Such systems can serve single buildings (e.g. with plant located in an energy centre in an office building basement). For larger schemes, they involve standalone generation facilities and pipeline infrastructure to provide electricity and heat to a number of buildings, or whole districts (district heating networks), with secondary heat pipework networks within each building. Electricity can be supplied by the energy centre or through a connection to the local distribution network (or a mixture of both).

The rationale for using CHP-related energy supplies is both economic and environmental. It typically provides a cheaper way for occupiers to obtain energy (both electricity and heat) than arranging their own supplies with utilities. Where energy centres are connected to the distribution network, CHP systems can be switched on when electricity prices are high and excess power can be sold to the grid when this makes commercial sense. As less energy is lost to the environment with the possibility to use low carbon fuel sources (such as biomass), this can contribute to progress towards sustainable zero-carbon buildings and compliance with legislation and policy requirements. Such systems also generally require less total space than traditional alternatives.

While many new real estate developments will incorporate energy centres or connections to larger district heating networks from the beginning, it is also possible to retrofit the technology into existing buildings, although this is generally much more challenging and costly. Although energy centres are often established using natural gas as the primary fuel source, this can be changed over time to incorporate renewable sources such as biomass.

What is Combined Heat and Power ("CHP") technology?
CHP technology involves a combustion process to generate electricity from fuels such as natural gas or biomass using turbines. The waste heat generated by the combustion process is then used for heating (including hot water supply) and/or cooling purposes.

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STRUCTURING DECENTRALISED ENERGY ARRANGEMENTS

Energy centres serving single buildings will usually be constructed and operated as part of the building asset by a developer or occupier and no particular structuring will be required. This section therefore concentrates on the development of decentralised energy networks serving multiple buildings. As revenues from the provision of electricity and heating services can be relatively stable, decentralised energy networks have become of interest to investors as a separate asset class. The ability to uncouple ownership of the network assets from the buildings that they serve therefore becomes important.

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For smaller networks (for example those serving an office or mixed-use estate), an energy service company (ESCo) may be appointed for the construction and operation of the district heating network. This might, for example, be a company formed by the developer involved in creating the wider development, or even a third party such as a utility provider or other investor. The initial capital costs of larger decentralised energy networks can be significant and therefore an ESCo will seek exclusivity commitments for a base level of users to avoid connections to competing utilities. Use of an ESCo can facilitate the funding of the infrastructure involved and deal with the ongoing operation and maintenance of the energy plant, pipeline and cabling infrastructure.

A typical basic structure for a single-site scheme will involve the developer constructing the buildings (including the internal heat network piping) and core of the energy centre. The ESCo will then install, operate and maintain the plant and external pipeline / cabling infrastructure for a lengthy period (say up to 40 years), supplying electricity and heat to occupiers. Payments by occupiers allow the ESCo to recoup its investment over the contract period. Alternatively, the developer might develop the whole system and transfer the energy centre and network elements to the ESCo once completed. A number of agreements will be involved in this type of structure, with the key contracts including:

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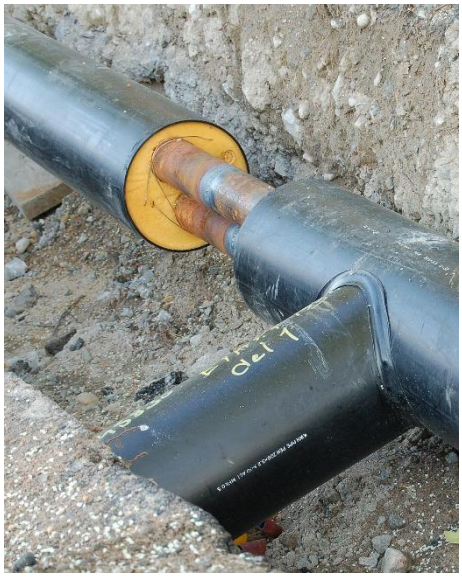
- **Master agreement between the ESCo and Developer / Consortium**: Deals with the construction of the core buildings, energy centre (if new) and other infrastructure and the operation / maintenance of the electricity / heat network and the provision of secondary and back-up power / heat / cooling. Developer will want to reserve a certain amount of capacity to ensure its developments can connect to the energy centre and so as to reduce the risk of having to fund expansion costs in future.
- **Fuel supply agreement / power purchase agreements and grid connection agreements**: Agreements between the ESCo and suppliers of electricity, natural gas or biomass.
- **Standard heat supply agreements between the ESCo and occupiers**: A series of standard supply agreements dealing with the supply of electricity / heat to occupier customers. Key terms within these agreements will be how the energy charges to occupiers will be set and compensation for failure to provide supplies. A balance will need to be struck between the ESCo's need to make a suitable rate of return and the need to ensure that occupier charges remain cheaper than sourcing supplies from the grid (in particular, since the ESCo will effectively operate a monopoly for heat

supply). Early assessment of the economics of the pricing will be essential.

- **Construction Contracts**: Typically the energy centre (if new) and distribution grid will be separately procured. The energy plant will usually be arranged on an EPC/supply and install basis, potentially as a section of wider works if it is being installed in a new structure.
- **Lease of the energy centre between the ESCo and Developer:** Such leases are commonly granted for a term of 30-40 years. The key terms will be the grant of the rights and easements over the pipeline and cabling, which may be protected by restrictive covenants over specified easement strips. A lift-and-shift provision may allow the Developer to relocate the plant and equipment at its own cost in the event of a redevelopment during the term of the lease. Consideration needs to be given to the potential tax implications of such a provision and who will benefit from any capital allowances, which will depend on the legal ownership of the plant and equipment.



CONSTRUCTION ISSUES

There are frequent mis-matches between the full design and build wrap required by the developer from the main contractor and the various limits on liability sought by engineers and the energy company which may include overall financial caps. This risk is usually priced by the main contractor which can add to the cost of the project.

Legal complexity can arise in terms of:

- Interfaces between the energy centre and the distribution network – any warranted efficiency will be dependent on return temperatures to the energy plant and the energy centre contractor and operator will not take risk on this;
- Energy centre reliance on engineering and works carried out by others. This may require novations of specialist consultants and a realistic approach where their liability is limited by caps/insurance.
- Responsibility for the primary and secondary pipework design and interface risk;
- Risk of delay to the overall project if the primary pipework being delivered and installed to the boundary of site by the energy company (often across multiple land ownerships) runs late;
- Contractual mismatches between the energy centre construction and operation and maintenance contracts and the contracts for the network, which may further complicate interface risk;
- Calculation of liquidated damages for delay if the section of works comprising the energy centre box is late;
- Performance efficiency and any output/yield warranties and liquidated damages for the energy centre; and
- Access arrangements for the energy company during construction of the wider project and responsibility for time and cost consequences of any associated disruption.

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PLANNING ISSUES

Planning policy support (from national to local level) seeks both to facilitate creation of district heating networks and require individual buildings to be sustainable (including in the use of energy).

Buildings / Energy Centres

In the City of London, for example, planning policy requires new buildings to reduce carbon emissions and to offset remaining emissions. It also requires larger real estate developments either to connect to existing decentralised energy networks or, where that is not possible, install onsite CHP (with potential future connection to new decentralised energy network infrastructure). There is an increasing policy emphasis on moving away from gas to lower carbon fuel sources.

The creation of an energy centre and any related equipment will normally be contained within the planning permission for the building. Any requirement to connect to existing or future energy networks will normally be a condition to the planning permission for the building. In such a case, it will be important to ensure that the planning permission retains flexibility as to the location for relevant pipes or other infrastructure at the boundary of the building (e.g. heat interface units which allow energy from the heat to be transferred to the building's own energy pipes and radiators) and for necessary internal plant space. Another consideration will be how the energy centre element of a building development will be treated for Community Infrastructure Levy purposes (i.e. whether it will be treated as chargeable floorspace).

It is also possible that a developer may have to contribute towards the creation of a wider decentralised energy network, either through entering into a Section 106 Agreement obligation in order to obtain planning permission, or through its associated Community Infrastructure Levy contributions.

Networks

The creation of pipelines and cabling necessary for the network will also require planning permission unless the local authority is involved in the project using its "permitted development rights". For larger district networks, some local authorities have put in place "local development orders" granting planning permission to build a network in advance of proposals coming forward (e.g. used by Newham Council for the London Thames Gateway Heat Network).

"The creation of pipelines and cabling necessary for the network will also require planning permission unless the local authority is involved in the project using its 'permitted development rights'"

In addition, where network infrastructure will go along, or cross, public roads or footpaths, licences will be required from the highway authority to install and maintain the equipment.

REGULATORY AND LICENSING

A significant number of regulatory and licensing issues will need to be addressed to construct and operate an energy centre / district heating scheme. Key areas will include:

- Licensing under the Electricity Act 1989 for generation, distribution and supply of electricity to occupiers and laying of cables (and in particular the extent to which ESCos are exempt from standing licensing requirements). Simplified licensing is now available for supply of electricity where the network will be connected to the grid (as opposed to being a "private wire network" isolated from the grid). Care must be taken to comply with the

statutory restrictions on the same person holding a distribution licence and a generation or supply licence. Under recent case law, occupiers must be allowed to source their electricity supplies from third party suppliers on the grid.

- EU-derived regulations on heat networks require meters to be installed to measure the provision of heat / hot water / cooling to individual customers and to base bills on actual usage.
- Renewable energy subsidies: Where eligible renewable fuels are used for heat generation (e.g. biomass or biogas), payments under the regulatory Renewable Heat Incentive scheme may be available to the heat provider for any element of heat produced by those fuels. Payments depend on the fuel type and plant size and are made on a "pence per kWhth" tariff basis, subsidising the cost of heat to customers. Enhanced capital allowances may also be available for the installation of qualifying energy-saving technologies.
- Environmental licensing: An Environmental Permit and Greenhouse Gas Permit (under the EU Emissions Trading System) will be required for any generation capacity of over 20MW.

"Decentralised energy networks are constantly evolving and increasingly becoming "smart" energy networks, linking electricity and heat production"

MOVING FORWARD

The Government continues to maintain its triple energy policy of a clean energy system, with secure supplies, offering affordable energy. Decentralised energy networks for large real estate developments seem likely to feature heavily in this strategy (supported most recently in the Government's Clean Growth Strategy). From the heat perspective, the government believes that up to 43% of heat demand could be satisfied by heat networks by 2050. This is, however, just the start of the story. Decentralised energy networks are constantly evolving and increasingly becoming "smart" energy networks, linking electricity and heat production, for example by:

- Allowing buildings to benefit from flexible supply of the cheapest energy available at the time (using heat or electricity storage) so it can be produced when cheapest to do so and used when needed; and
- Incorporating smart meter technology and smart appliances to control energy use in buildings served by the network to improve energy efficiency and further reduce cost.

"Inevitably, as decentralised energy networks have become more attractive as investable assets in themselves, increasingly complex ownership structures are likely"

Decentralised energy networks potentially also have a role in providing flexibility to wider energy networks (e.g. on-site power and heat generation and energy storage providing electricity and heat to wider networks needed as back-up or balancing services). However, some of these wider aspirations are hindered by economic and regulatory constraints which the Government and industry are working to overcome[1].

Inevitably, as decentralised energy networks have become more attractive as investable assets in themselves, increasingly complex ownership structures are likely. These will focus on the available financial incentives, tax treatment and the ability to uncouple network assets from building assets.

[1] See our recent briefing: New plan for Energy Storage, Smart Systems and Flexibility – July 2017

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