

Heat too rash

The Energy Efficiency Directive's plan for mandatory combined heat and power is winning few friends, reports Siân Crampsie

The European Commission is pressing for combined heat and power (CHP) to become the default option for new thermal power plant but its proposals are too prescriptive and goal unrealistic, according to industry experts.

The European Union's executive body believes CHP could play a major role in improving energy efficiency in the 27-nation bloc and has included a plan to increase the use of the technology in the proposed Energy Efficiency Directive (EED). Specifically, it wants member states to ensure that all new thermal electricity plant above 20MW use high efficiency CHP technology and be sited where waste heat can be used. Plants undergoing significant refurbishment would also be required to convert to CHP.

Member states would also be required to draw up national heating and cooling plans outlining how the potential for CHP would be developed. If passed, this section of the EED (currently being debated in

the European Parliament) would replace the existing Cogeneration Directive.

However, the requirement for mandatory CHP is "not feasible" and would introduce "a number of economic inefficiencies", says David Porter, chief executive of the Association of Electricity Producers (AEP).

"First, power stations cannot always be sited near to large heat demand, either for planning reasons, particularly in urban areas, or because of lack of access to fuel, water for cooling or grid connection," says Porter. "Locations that are optimal from the viewpoint of heat supply, such as near homes and businesses, are unlikely to be optimal from a power generation viewpoint."

"Second, there must be a base of heat customers that are willing to transfer from their existing heating system to the CHP system. Third, developing heating network systems is an expensive addition to any new power station."

His arguments reveal the complexities of siting CHP facilities and of developing heat markets: different customers need different types of heat, ranging from process steam to hot water; plant developers need to mitigate "heat risks," such as the loss of industrial customers that close down or move; existing heat users already have a source of heat; and network development requires investment.

Such barriers are blamed for the relatively poor uptake of CHP across much of Europe even since the Cogeneration Directive came into force. The EU as a whole generates 11 per cent of its electricity using cogeneration, but there is a large divergence between member states, with some using little or none (Malta, Greece and Cyprus) while others, such as Denmark, use large amounts.

In the UK, CHP accounts for around 7 per cent of electricity generation from an installed capacity of 6GW. The government wants to increase the installed capacity to 11.3GW by 2020, but the Combined Heat and Power Association (CHPA) believes this will be impossible without the right policies and support in place, even though heat accounts for more than half of the UK's energy demand.

The CHPA says the example of Denmark shows that barriers to cogeneration can be overcome with the right market mechanisms. "It is not reasonable to expect a generator to build a district heating network," says CHPA policy manager Tim Rotheray. "The power network is funded through a regulated model ... we just need a mechanism to ensure that district heating networks are built. If they were built on a large scale, then heat risks would be reduced and utilities would be more willing to build CHP plants."

Rotheray says that the government could develop policies that encourage the clustering of heat-intensive industries to help de-risk investment in CHP, which is generally more capital-intensive than conventional thermal plant. "It is not investable at the moment," says Rotheray. "There is too much policy uncertainty and a lack of clear support for CHP [in the UK]."

He also points out that exemptions to the require-

ment for CHP would be allowed if cost-benefit analyses for a proposed new power plant to recover heat were negative. Nuclear plant would also be exempt. "We understand that the ... text of the EED excludes new nuclear power stations, most CCS [carbon capture and storage] and peaking plants from the CHP cost-benefit analysis requirement," he says.

"Electricity generators support this proposal," says the AEP's Porter. "The cost-benefit analysis should be carried out on sites where there is potential to develop CHP. For sites where CHP is not viable, it is sensible to exclude them from the requirement completely."

The AEP also believes that a CHP requirement could raise some challenges for the utilities operating those plants, especially as the level of renewable energy on the grid increases. "CHP can be extremely efficient and cost-effective in the right situation," says Porter. "However, CHP plant works best where there is a constant heat demand and is less suitable for low load factors."

"As the power sector decarbonises over the next 20 years, fossil plant will generally no longer operate on baseload but at times when nuclear and renewable generation is not available. This could mean that plant would have to operate in heat-only mode, which is less efficient, for significant periods."

The CHPA, however, argues that efficient gas-fired CHP plants are an ideal low-carbon back-up solution

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for intermittent renewables. "You can design CHP to be very flexible," says Rotheray. "CHP plants have a minimum level of stable generation required to meet their heat needs and this is usually very low. They also have a very high level of reliability. If you have the right systems in place to encourage flexible CHP, then these plants can be a solution to support renewables."

In any case, Rotheray is not confident that the proposal to make CHP the default option for new plant will make it into the final directive because it does not have enough support from member states. "The aim of the Commission is right but we are fearful of the negative reaction," says Rotheray, who believes that the directive appears "too prescriptive". He says a better option would be legislation that provides scope for all forms of energy efficiency – including CHP – in all areas of the energy supply chain, with an overarching target based on primary energy.

"We advocate the notion that power stations should be more carefully thought through with regards to siting, but the way to achieve this is not to say that all new power stations must have district heating," he concludes.

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