

Decentralising energy – the Woking case study

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“Woking has been able to extract the true economic benefits of combined heat and power and renewable energy technologies” Allan Jones, London Climate Change Agency and formerly Energy Services Manager, Woking Borough Council.

Woking Borough Council is at the forefront of the decentralised energy revolution in the UK. It has pioneered the development of a network of over 60 local generators, including cogeneration and tri-generation plant, photovoltaic arrays and a hydrogen fuel cell station, to power, heat and cool municipal buildings and social housing. Many town centre businesses are also connected to this local energy supply.

Cutting energy use and carbon dioxide emissions: decentralising their energy has enabled Woking Council to slash energy use by nearly half, and council CO₂ emissions by a massive 77%, since 1990. As a percentage, that's equivalent to 6 times the UK's national Kyoto commitment to reduce emissions by 2010 – achieved 6 years early before 2010 and at no extra cost in the long term¹.

How it works: the generators are connected to users via private electricity wires owned and operated by Thameswey Energy Ltd – a company set up and partly owned by Thameswey Ltd, a municipal energy and environmental services company itself wholly owned by Woking Borough Council.

These private wires have points of connection to the local distribution networks (in turn connected to the national grid), but in 2003 the council's electricity infrastructure was 99.85% self-sufficient. In the event of a grid power cut the system can switch to island generation mode, meaning businesses and householders connected to the private wires continue to be supplied with electricity with only a short interruption while the system disconnects from the dead grid and restarts using a small black start generator (a generator which can start up with no external power input).

Funding developments: Woking was able to raise capital for energy infrastructure development initially through energy efficiency savings. A fund mechanism was established in a benchmark year for energy expenditure, against which savings accruing from energy efficiency measures were recycled, year on year, into further energy-saving initiatives. The substantial financial savings allowed the council to invest millions in energy supply innovation. Moreover, Thameswey Energy Ltd has attracted investment from Danish pension companies who recognise the steady low-risk return the initiative offers – energy systems like Woking's are a common component of investment portfolios for pension and insurance companies across Europe.

Costs: Developing a private network enabled Thameswey Energy Ltd to avoid charges usually associated with the use of the grid. By circumventing these costs, it has been able to fund wires and generation to deliver low emission electricity in competition with conventional suppliers. For domestic customers in social housing, Thameswey provides electricity below the rate of other electricity

suppliers as part of Woking Borough Council's fuel poverty programme. The council estimates that it supplies heat and power to potentially fuel-poor households for 6–7% of the state pension – well below the 10% threshold of all household income spent on heating that the Government uses to define fuel poverty.

While the Woking model is widely celebrated in energy circles, its significance for UK energy policy has yet to be fully appreciated. It shows that renewable technologies and cogeneration are highly complementary and lend themselves flexibly to a piecemeal engineering approach as finances allow.

The key lesson from Woking is that, liberated from the constraints of centralised rules and infrastructure, cogeneration and renewables can assert their own competitive potential.

Decentralised energy successes in Europe

The Netherlands: The Netherlands increased its use of combined heat and power (CHP) so successfully that in the period from 1985 to 1995 it grew to be the biggest single source of generation in Holland and according to the government will continue to grow - playing the most important role in the Dutch energy systemⁱⁱ.

According to a review by the Dutch government CHP also played the most significant role of any policy instrument in reducing CO2 emissions in the Netherlands in the period 1990-2000 and was also the most cost efficient policy instrument for reducing emissionsⁱⁱⁱ.

Denmark: In Denmark a strategy of decentralised energy focused on district heating and improving efficiency in the housing stock has led to an amazing result that the final energy consumption for space heating has *fallen* by over 15%, while the actual floor space heated has *increased* by over 20%^{iv}.

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For more information contact Greenpeace press office on 020 7865 8255.

ⁱ *Climate Change Strategy: Woking Borough Council*, page 5.

ⁱⁱ *On the essentials of Combined Heat and Power (CHP)*, personal research paper, Kees den Blanken, Director Cogen Nederland.

ⁱⁱⁱ *Ibid*

^{iv} Estimated from table: 'Energy consumption for space heating in households'; published in presentation *Reliable Danish Energy Policy*, Lars Gullev, Danish Board of District Heating, see: http://www.ees.dk/db/files/dbdhs_presentation.pdf.