

Date: 10 March 2011

## **ELECTRICITY MARKET REFORM CONSULTATION – December 2010**

### **Response from the London Borough of Croydon**

#### **Summary**

The Government's proposals will :-

#### **Stop development of new low carbon gas fired combined heat & power (CHP) schemes**

In the case of Croydon's proposed town centre CHP/district heating scheme the proposals for the new Carbon Price Support (CPS) will move a currently viable scheme to being unviable. The borough would no longer be able to implement a scheme that will secure significant CO<sub>2</sub> savings and contribute to regeneration by providing developers a cost effective means of meeting their building CO<sub>2</sub> reduction targets.

#### **Drive existing gas CHP schemes to stop operating as CHP (with subsequent increase in CO<sub>2</sub>)**

Supply of heat from CHP is very likely to become uneconomic and schemes will either optimise large CHP plant to generate electricity only, or community heating schemes will shut down CHP plant and revert to heat only boilers.

This response considers the Government's proposals from the point of view of CHP generation which is particularly suitable for urban areas. The real benefits of CHP have not been properly evaluated by successive Government energy consultation exercises which have looked at electricity and heat supply separately and in isolation. The result is that one of the most cost effective CO<sub>2</sub> reduction solutions for industrial and urban settings is effectively disadvantaged by the tax and incentive systems designed to reduce CO<sub>2</sub>.

#### **Benefits of CHP – Policy Gap**

The Government proposals seek to provide a regulatory and policy framework that will deliver national supplies of electricity that are secure, affordable and low carbon. While this framework will continue to be market based it is clear that the Government has made

some technology choices and intends to incentivise the market accordingly – i.e. favouring the 'all electric' scenario (with heat and transport sectors moving to electricity).

The proposed changes in taxation and incentives will be unfairly punitive to fossil plant operating as CHP and rule out a technology that can deliver the lowest cost CO<sub>2</sub> reductions (when implemented in the appropriate circumstances e.g. large industrial sites and dense/urban development).

CHP can play a part in delivering on all three of the Government objectives as it is the most fuel efficient way to operate any thermal generating plant. Fossil fuelled thermal generation will comprise a significant part of the UK electricity mix for years to come – whether as large coal CCS or flexible gas generation. Bio-fuels for thermal power generation will be a valuable resource. In both cases, the regulatory framework should encourage operation of this plant as CHP to maximise fuel efficiency (as well as to achieve CO<sub>2</sub> reductions).

Gas CHP and district heating is a solution particularly suited to urban areas where other forms of low carbon energy sources will be practically constrained e.g.-

- limited roofspace for solar technologies
- limited space for ground source heat pumps
- limited storage space for biomass and tight restrictions on air-quality

When implemented in this way, gas CHP can be considered as a cost effective low carbon transition technology that can be later replaced by renewable or waste derived fuels as the heat transport network is not tied to any fuel source.

As a simultaneous generator of both electricity and heat, the benefits of CHP have not been adequately addressed in successive policy documents which have focused on electricity or heat markets separately. It is impossible to comment on the current consultation's affect on CHP electricity without reference to the emerging policy on heat.

### **Impact of the Carbon Support Price (CPS)**

In each of the four proposed packages, the Government proposes the inclusion of the CPS as a tax on the input fuel to fossil fuelled electricity generation. When applied to fossil fuelled CHP the CPS will effectively introduce a tax on fuel used for heat.

There is no corresponding carbon taxation of fossil fuels used for heat only provision, the CPS therefore penalises CHP supply of heat. This will not be compensated for via heat policy in the form of the Renewable Heat Incentive which will not reward capture of waste heat from fossil fuelled electricity plant.

CHP community heating will not be able to pass on any of the additional CPS costs via the heat charge as CHP schemes can only secure future revenues by offering heat supplies at or below the equivalent cost of supply via individual gas boilers (which benefit from existing infrastructure and no carbon taxation).

#### **Croydon district energy project**

Croydon Council is developing a gas fired CHP district heating scheme to support the re-development of the town centre. Detailed financial modelling of the proposed scheme has been completed which shows that the scheme is financially viable.



The scheme is currently being developed to full business case prior to Council agreement to launch a procurement to select a scheme developer. Applying the lowest cost scenario for CPS to the scheme makes all configurations of the scheme unviable – the project would be abandoned. Further details are outlined in Appendix 1. We are happy to provide additional detail on the proposed scheme and financial model if requested.

### **Other reform package options & CHP**

The other elements of the proposed market reforms appear not to address co-generation of heat and power as a real means of providing “low carbon electricity”. Throughout the consultation “low carbon” appears to refer to only; nuclear, coal fired CCS and renewables. Fossil fired CHP is not referred to as a “low carbon” technology.

There is a danger that the various market tools being considered e.g. CPS, CfD FIT, EPS are being designed around and for specific technologies (nuclear, coal CCS and large wind). And that technologies such as CHP that straddle power and heat sectors will be penalised as the benefits of heat supply (primary fuel efficiency and offset emissions from alternative heat supply) are not rewarded.

The consultation document provides a number of examples of different approaches to low carbon electricity regulation taken by EU countries. However, significant examples missing are those that have delivered large scale adoption of CHP generation (along with affordable heat and low CO<sub>2</sub> emissions).

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

## APPENDIX 1

### Croydon Metropolitan Centre – district energy scheme

- Regeneration of town centre – 380,000 m<sup>2</sup> of new commercial floor space & 4,000 new residential units.
- Scheme also offers low carbon affordable heat to existing buildings delivering around annual reduction of 9,000 tonnes CO<sub>2</sub>
- Gas fired CHP scheme provides developers a cost effective way to meet:-
  - statutory “Building Regulations” : goes beyond proposed minimum onsite CO<sub>2</sub> reduction proposed by zero carbon dwelling standard (2016)
  - current Croydon planning policy (‘Code for Sustainable Homes’ Level 4, BREEAM “Excellent” for non-domestic buildings)
- Map below shows the extent of the proposed scheme

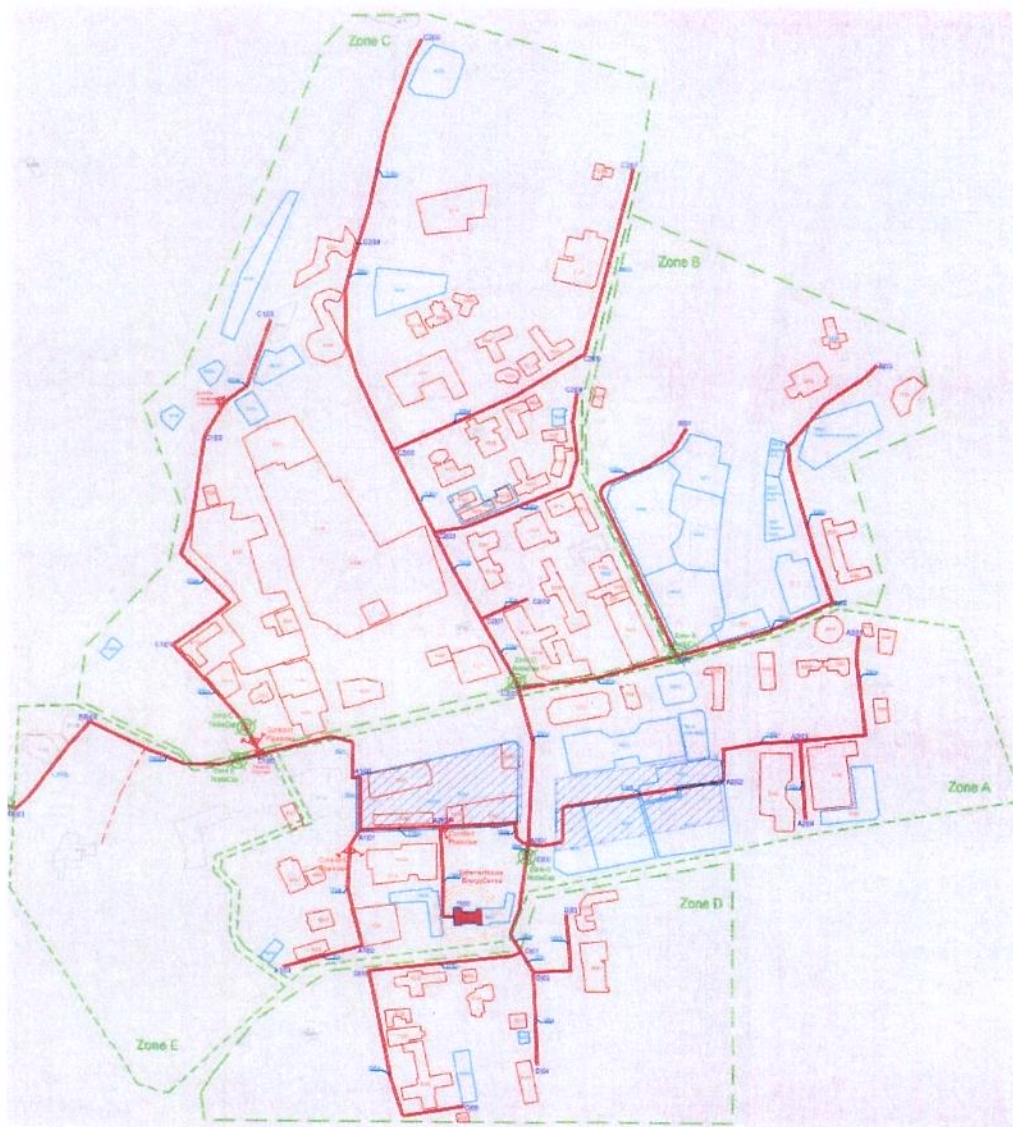
Red lines	district heat network
Red outlines	existing buildings
Blue outlines	new development plots
Green dotted lines	DE scheme zone boundaries

- Financial modelling to date has analysed the capital costs and discounted revenue cash flows for 8 different configurations of the zones outlined on the map – all served from a central energy centre marked in red (highlighted by red circle)
- Modelling assumes that heat charges are indexed to gas and represent a small discount on the equivalent individual gas boiler cost (e.g. including maintenance and replacement costs) that a customer would pay. All generated electricity assumed to be sold back to grid (as ‘worst case’ revenue).
- Modelling exercise has run sensitivity analysis on discount rate, borrowing rate and potential public sector capital injection. Base case in results tables below adopts:-  
Discount rate      5%  
Borrowing rate    4.7%
- Four of the scheme configurations showed a positive NPV with larger sized schemes serving more zones providing the greatest return. However, the scheme is unlikely to offer commercial rates of return and therefore the council is considering taking an equity stake to establish a public-private vehicle.

### Effect of CPS

- CPS charges were applied to the CHP revenue model at the minimum rates of Scenario 1 in the Treasury/HMRC “Carbon price floor” consultation. The tables below show the effect of applying CPS to the different CHP scheme configurations.
- **CPS makes all scheme configurations unviable – Council abandons project**





#### Without Carbon Price Support

Scenario name:	NPV Capital cost	NPV Total Plant on 23 years Network on 38 years
Energy centre supplying - A, B, C	£15,770,270	£5,489,369
Energy centre supplying - A, B, C, D	£17,177,845	£5,352,297
Energy centre supplying - A, C	£13,023,895	£1,261,590
Energy centre supplying - A, C, D	£14,385,085	£1,192,123
Energy centre supplying - A, B, D	£8,345,554	£68,024
Energy centre supplying - A	£4,958,211	£3,775,237
Energy centre supplying - A, D	£4,917,801	£2,136,761

#### With Carbon Price Support at Scenario 1

Scenario name:	NPV Capital cost	NPV Total Plant on 23 years Network on 38 years
Energy centre supplying - A, B, C	£15,770,270	£6,761,159
Energy centre supplying - A, B, C, D	£17,177,845	£7,453,523
Energy centre supplying - A, C	£13,023,895	£8,718,066
Energy centre supplying - A, C, D	£14,385,085	£9,342,618
Energy centre supplying - A, B, D	£8,345,554	£6,283,916
Energy centre supplying - A	£4,958,211	£7,164,927
Energy centre supplying - A, D	£4,917,801	£6,081,619

