



Gas and electricity licensees,
consumer groups, and
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Dear Colleague.

Preliminary accreditation of Blue NG's Beckton generation station under the Renewables Obligation (RO).

Overview

In October 2008 we (Ofgem) published our [decision](#) to grant amendments to National Grid Gas (NGG) licence in order to commence generating electricity at Gas Distribution pressure reduction sites. The derogations provided for electricity to be generated at eight gas distribution pressure reduction sites on a trial basis with monitoring of this project being undertaken by ourselves.

Blue-NG, a joint venture between National Grid plc (NG) and 2OC Ltd, have made an application for accreditation of a generating station that uses turbo-expanders placed at NGG pressure reduction stations. Their proposal uses the waste heat from a biomass electricity generator to pre-heat the gas.

We have reviewed this application and we have concluded that should the station be built it would be capable of generating electricity from renewable sources. We have therefore today granted preliminary accreditation for the Beckton station with an effective date of 19 January 2009.

History

Before the derogations were granted we were approached by 2OC Ltd with a proposal that used pressure reduction in order to produce electricity. 2OC originally presented their concept to us they proposed to utilise 'geopressure', or the pressure of the gas in the distribution network to drive a 'turbo-expander' turbine. They gained preliminary accreditation for a site at Huntsman BOC. However, we questioned whether all the electricity generated would be renewable, given that there are a number of pumps used to move the gas from gas field through the network. We concluded that all power used for these purposes would need to be deducted as input any generator wishing to claim ROCs under this technology type would need to provide evidence to support how they are able to identify and deduct any electrical inputs 'upstream' of the generating station.

Current Proposal

The Beckton application is complex due to the design of the station and because the turbo expanders are used to reduce the pressure of the natural gas in the distribution network. The Beckton site combines:

1. 12.6 Megawatts of biomass powered reciprocating engines.
2. A 2.0 Megawatt heat recovery turbine running on the waste heat from the biomass engines.
3. A 6.5 Megawatt turbo expander with the natural gas being pre-heated using waste heat from the biomass engine.

The RO accreditation covers all three of these elements.

Assessment of Proposal

In this configuration Blue-NG explained that the turbo-expander only extracts work from the cooling of this gas rather than the pressure reduction. It is the output from the turbo expander that we were initially concerned may derive power from both the pressure reduction and the extraction of heat energy and as such the power may not all be seen as renewable.

To address our concerns we decided to seek further information from the generator. In response to this request Blue-NG provided extra thermodynamic evidence to support the application. In order to verify this evidence we commissioned external expert advice which is published along with this note.

Blue-NG provided explanation that waste heat from the biomass engine was used to heat up the natural gas in the distribution network. This gas is then expanded through a turbo expander. This expansion cools the gas and the pre-heating from the waste heat compensates for this cooling. This replaces some of the need for natural gas to be used at the pressure reduction station to heat the expanded gas to acceptable delivery temperatures.

Blue-NG presented the case that this use of a turbo expander differs from a geopressure powered station in that the electricity is produced by the change of enthalpy of the gas rather than the pressure difference of the gas. They explained that the change of enthalpy is entirely derived from the biomass heat that is used to pre-heat the gas. In order to support their case Blue-NG provided detailed scientific analysis to support why it believed this should be seen as a renewable process.

In assessing any application for accreditation we review the station's eligibility. As this station proposed new technology and is complex we have subjected the application to two rounds of technical scrutiny in addition to our normal reviews.

We initially discussed the application with our internal technical experts who reviewed the proposal and supporting evidence. We then commissioned a report from AEA Technologies to gain independent analysis and verification. We asked that AEAT looked into any circumstances that would mean that the turbo expander was generating from other energy sources (which didn't qualify for ROCs) rather than from the waste heat.

The external report (available on request) concurred with the explanation given by Blue-NG and identified criteria for when output from the turbo-expander could be seen as having produced renewable electricity. The report identified that in circumstances where the temperature after expansion was greater or equal to the temperature in the gas before the waste heat was transferred then all the electricity generated would be due to the change in enthalpy and could therefore be seen as renewable. If this criterion was not met then the turbo-expander would be taking additional energy from the gas so this could not be seen as wholly renewable.

Our Conclusion

We have concluded that this station is eligible for preliminary accreditation under the RO. The application has been made after planning permission has been received and we have concluded that the station is capable of generating electricity from renewable sources. This preliminary accreditation is subject to our standard conditions for preliminary accreditation that is having been granted preliminary accreditation, we reserve the right to not grant full accreditation if:

- (i) in our view there has been a material change¹ in circumstances since the preliminary application was granted
- (ii) we have reason to believe that the information on which the decision to grant the preliminary accreditation was based was incorrect in a material particular, or
- (iii) there has been a change in applicable legislation since the preliminary accreditation was granted such that, had the application for preliminary accreditation been made under the amended legislation, it would not have been granted in our view²

However, we have also proposed that appropriate monitoring and controls would have to be arranged to ensure that it was possible to avoid or identify when the turbo-expander was running in a non-renewable manner. Evidence of this is a specific condition of accreditation.

The preliminary accreditation relates only to the Beckton site, should we receive applications for other sites using similar technologies these will be assessed on a case by case basis.

Kind regards

David Fletcher

Manager: Renewable Generation.

¹ In this context, "material change" means that the generating station as planned or built is no longer eligible under the RO. Whilst the onus remains on the applicant to satisfy the requirements of the legislation, we will, where we can, advise as to whether changes will have an effect on eligibility.

² We will contact the operator of the generating station with details of any changes to the applicable legislation and will be able to advise as to any impact on the station's eligibility under the amended legislation.