



OFFICE OF CLIMATE, LICENSING & RESOURCE USE

CLIMATE CHANGE & ENVIRONMENTAL RESEARCH UNIT

PROPOSED NEW ENTRANT VERIFICATION REPORT		NE2-008/9/CHP2-003-R1
New Entrant Register Number	Verified NESAs Priority	Verified CHPSA Priority
NE2-008/NE2-009/CHP2-003	6 & 7	3
Date: 31 August 2012		
Application for a free allocation of EU allowances from Ireland's New Entrant Set Aside 2008-12		

Application Details	
Operator Name:	Dublin Airport Authority
Installation name:	Dublin Airport
Installation address:	Dublin Airport, County Dublin.
GHG permit Register number:	IE-GHG094-04
Class of activity:	Combustion installations with a rated thermal input exceeding 20 MW (except hazardous or municipal waste installations)
NESA and CHPSA application received:	23 July 2009
Correspondence (Request for Further Information) issued:	29 July 2009, 18 September 2009, 5 October 2009, 2 March 2010, 26 March 2010
Further information received:	12 August 2009, 17 September 2009, 5 November 2009, 15 March 2010, 30 March 2010, 19 May 2011, 16 March 2012, 13 June 2012, 9 July 2012.
New Entrant proposed start date:	1 September 2009

Description of the development and increase in capacity:

The application from the Dublin Airport Authority to the New Entrant and CHP Set-Asides relates to the development of Terminal II at Dublin Airport. Terminal II is the new 75,000 square metre facility and is serviced from its own energy centre, supplying space heating, power and hot water. The new terminal is a stand-alone building in terms of energy consumption and is not connected with the energy centre of Terminal I.

The new energy centre contains three gas fired thermal boilers, two diesel generators for emergency power and some 'peak-shaving' and a "high efficiency" gas fired combined heat and power plant (Edina) according to the definition in Directive 2004/8/EC. The CHP plant has a 7 MW thermal input capacity and 3 MW electrical output capacity.

GHG permit (IE-GHG094-004) was revised and reissued 19 August 2009 to permit the commissioning of the boilers, generators and CHP plant in Energy Centre as follows:

Emission Point Reference	Emission Point Description	Thermal Input Capacity	Capacity Units	Proposed commencement date
EC-4.1	Gas Fired HW Boiler Stack	4	MW	1 September 2009
EC-4.2	Gas Fired HW Boiler Stack	4	MW	1 September 2009
EC-4.3	Gas Fired HW Boiler Stack	1.9	MW	1 September 2009
EC-4.4	Combined Heat and Power Stack	7	MW	1 September 2009
EC-4.5	Diesel Generator Exhaust	5.2	MW	1 September 2009
EC-4.6	Diesel Generator Exhaust	5.2	MW	1 September 2009

Consents submitted:

- **Planning permission:** Register Reference F06A/1248, granted on 25 October 2006 for the Terminal, including a two story over basement energy centre, for power and heating and cooling supply.
- **Commission for Energy Regulation**
Authorisation to construct a 7.6 MW CHP and diesel electric generators at T2 Energy Centre at Dublin Airport, granted on 24 February 2009.
- **Commission for Energy Regulation:**
Electricity generation licence, granted on 24 February 2009.
- **Electricity Supply Board Networks:**
Major User Connection Agreements, No: 6001117759 dated 25 April 2007 and 6001065438 dated 24 April 2007 for the Dublin Airport Authority.

Site Inspection:

Date of site inspection: 30 July 2009, 13 March 2012 and 26 June 2012.

Application representatives: Barry O'Connor, Robert Walsh, Martin McGonagle and Mark Leahy

EPA representatives: Marc Kierans.

Basis for priority on New Entrant Application Register: All the necessary permissions were granted and in place at the time of the application to the NESA and the CHPSA were made on 23 July 2009. Therefore 23 July 2009 is the basis for the Priority on New

Entrant Application Register.

Site tour observations: Documentation examined:

(i) Substantiated valid business reason:

The planning and substantiation of the business reason for Terminal II is a matter of public record.

(ii) Substantiated new entrant start date:

21 May 2009 for the boilers and 20 May 2010 for the CHP, commissioning certificates supplied.

(iii) Basis for Projections:

Projections are based on the Dublin Airport Authority's operating strategy of using the CHP plant as the main source to provide heat and power to the facility with the boiler plant operating on standby and seasonal top-up. The thermal output of the CHP plant is insufficient during the colder months. Standby generators may operate as part of the Winter Peak Demand Reduction Scheme (WPDRS).

(iv) Invoices and internal documents:

A review of the gas invoices and computer records for Terminal 2 and boiler and CHP operations was carried out.

(v) Boiler, CHP and emergency plates:

Confirmation that plant was installed as specified.

Detailed Calculation of Projected Emissions

Applicant methodology for calculation of projected emissions:

A series of historic and projected emissions were submitted by the Operator with the latest submission made on 16 March 2012 and the projections are made up of a combination of historic emissions and projections based on the following elements:

Heat and Emergency Generation:

The projected emissions for the new terminal are based on the design criteria of the maximum thermal demand for the building and its facilities under a range of predicted operating conditions.

The emissions arising from the boilers are determined using following formula:

Thermal Input Capacity (kW) x Weather factor for Dublin (0.63) x Conversion factor kWh to tCO₂ (0.205×10^{-3}) x Number of hours of operation per day (8 hr, 16 hr, 24 hr) x days per month.

The emissions arising from the emergency generators which are fired on gas oil were determined using following formula:

Thermal Input Capacity (kW) x Conversion factor (kWh to tCO₂) x 2 hr x 30 days.

CHP electricity and heat:

The electrical output of the CHP plant is 3MWe, it is reported that the output will always be less than the electrical demand of the terminal itself, which is determined at 7.2 MWe. Therefore, all of the electrical output from the CHP plant will be used by the building and it will not be exported.

The projections for the emissions from the CHP plant were determined by the Operator using the following format.

Thermal Input Capacity x Conversion kWh to tCO₂ x hours of operation per day x 27.6 day month.

Where:

$$7,000 \times 0.205^{10^{-3}} \times 24 \text{ hr} \times 27.6 \text{ day} = 947 \text{ tCO}_2 \text{ month.}$$

The projections did not differentiate between projected emissions arising from electrical and heat production. The projections for the CHP in 2010 was adjusted to allow for the ramp-up of the CHP plant to full utilisation in 2011 and subsequent years.

Applicant Projected tonnes CO₂/annum as of 16 March 2012

Unit	2009	2010	2011	2012
Boilers	0	2,765	2,103	7,296
Gas oil	0	0	7	12
NESA sub total	0	2,765	2,110	7,308
CHP	0	42	2,285	11,364
Total	0	2,807	4,395	18,672

EPA methodology for calculation of projected emissions:

CHP electricity:

In accordance with Appendix 3 (2) of Ireland's National Allocation Decision for Emissions Trading 2008-2012 in relation to CHP, allocations will be based on projected emissions arising from combustion of fossil fuels assuming use of state-of-the-art CCGT. The approach deemed appropriate by the EPA is based on a "Best New Entrant" (BNE) CCGT power plant (CER 2007). Furthermore, the CHP plant qualifies as a "high efficiency" plant according to the definition in Directive 2004/8/EC.

The commissioning date for the CHP plant is 20 May 2010. The basis for the projections has been determined as follows:

(Net electrical output MW/BNE efficiency for CCGT plant of 54.7%) x (number of hours per year) x (CER recommended capacity utilisation factor, 90.87%) x (Country Specific Emission factor for natural gas, (NCV)/ 277.778 (conversion factor MW to TJ) and rounded to the nearest whole tonne.

Where: Net electrical output = 3 MWe

Year	Country Specific emission factor tCO ₂ /TJ	Annual GCV to NCV conversion factor
2009	57.122	0.9028
2010	56.873	0.9028
2011	57.022	0.9029
2012	57.022	0.9029

Calculation:

2009: Not in operation.

2010: 3 MWe /0.547 (BNE Efficiency) x 5,424 (No of hours from 20 May to 31 December: 226 days) x 0.9087 (Capacity utilisation factor) x (56.873/277.778) (NG emission factor t CO₂/MW) = **5,535 t CO₂**

2011: 3 MWe /0.547 (BNE Efficiency) x 8,760 (No of hours in the year) x 0.9087 (Capacity utilisation factor) x (57.022/277.778) (NG emission factor t CO₂/MW) = **8,962 tCO₂**.

2012: 3 MWe /0.547 (BNE Efficiency) x 8,784 (No of hours in the year) x 0.9087 (Capacity utilisation factor) x (57.022/277.778) (NG emission factor t CO₂/MW) = **8,987 tCO₂**.

CHP heat:

In relation to heat generation from the CHP plant, the 2010 and 2011 emissions are calculated based on invoiced gas to the energy centre, from which the split between the boilers and CHP plant is determined by a DAA meter. The gas consumed for the thermal output from the CHP plant is determined and adjusted by using the manufacture's technical data. The following formula was applied:

Total gas used at the CHP plant (gross kWh)* CHP Plant thermal efficiency (0.422)* annual GCV to NCV* conversion factor kWh to TJ (3.6×10^{-6})* annual Emission Factor tCO₂/TJ = tCO₂ and rounded to the nearest whole tonne.

Calculation:

2009: Not in operation.

2010: 204,300 kWh*0.442*0.9028* 3.6×10^{-6} *56.873= **17 tCO₂**

2011: 13,627,017 kWh*0.442*0.9029* 3.6×10^{-6} *57.022= **1,116 tCO₂**

2012: 13,567,763 kWh*0.442*0.9029* 3.6×10^{-6} *57.022= **1,112 tCO₂**

Historic data was available up to May 2012 after which the projections for remainder of 2012 is based on 2011 historic data for the same period, as the terminal was in full operation during that period.

EPA Projected tonnes CO₂/annum from the CHP Set-Aside:

Unit	2009	2010	2011	2012
CHP Electricity	0	5,535	8,962	8,987
CHP Heat	0	17	1,116	1,112
Total	0	5,552	10,078	10,099

Historic and projected emissions from the boiler plant:

In relation to heat generation from the boiler plant, 2009, 2010 and 2011 emissions are based on invoiced gas to the energy centre, from which the split between the boilers and CHP plant is determined by a DAA meter. The following formula was applied:

Total gas used in boiler plant (gross kWh)* annual GCV to NCV* conversion factor kWh to TJ (3.6×10^{-6})* annual Emission factor tCO₂/TJ = tCO₂ and rounded to the nearest whole tonne.

Calculation:

2009: 2,106,403 kWh*0.9028* 3.6×10^{-6} *57.122= **391 tCO₂**

2010: 13,488,767.00 kWh*0.9028* 3.6×10^{-6} *56.873= **2,493 tCO₂**

2011: 8,027,106 kWh*0.9029* 3.6×10^{-6} *57.022= **1,488 tCO₂**

2012: 8,631,515 kWh*0.9029* 3.6×10^{-6} *57.022= **1,600 tCO₂**

Historic data was available up to May 2012 after which projections for remainder of 2012 is based on 2011 historic data for the same period, as the terminal was in full operation during that period.

Historic and projected emissions from the emergency generators:

In relation to emissions from the emergency generators, 2010 and 2011 emissions are calculated based on the verified gas oil consumption to the boiler plant. The following formula was applied:

Total gas oil used (kt)*NCV TJ/kt* annual Emission factor tCO₂/TJ = tCO₂ and rounded to the nearest whole tonne.

Projections for 2012 are based on 2011 historic data as the terminal was in full operation during that period and adjusted for the leap year.

Calculation:

2011: 0.01522 *43.31*73.3=**48 tCO₂**

2012: 0.01526 *43.31*73.3=**48 tCO₂**

EPA Projected tonnes CO₂/annum from the NESAs Set-Aside:

Unit	2009	2010	2011	2012
Boilers	391	2,493	1,488	1,600
Emergency Generators	0	0	48	48
Total	391	2,493	1,536	1,648

Recommendation:

The New Entrant and CHP Set-Aside application was found to have the necessary consents in place and to have a substantiated start date of 21 May 2009 for the boilers and 20 May 2010 for the CHP plant. The assigned priority date for the New Entrant and CHP Set-Aside is 23 July 2009.

The determination of the Relevant Emission for the CHP plant for electrical production is in accordance with Appendix 3 (2) of Ireland's National Allocation Decision and thermal element is based on the verified gas consumption of the CHP plant up to May 2012. The remaining element of the 2012 RE projection is based on the 2011 historic data for the relevant period.

The determination of the Relevant Emission for the boiler and emergency generator plants is based on the verified gas and gas oil consumption up to May 2012. The remaining element of the 2012 RE projection is based on the 2011 historic data for the relevant period.

It is recommended that the allocation be taken from New Entrant Set-Aside for the boiler and emergency generators and from CHP Set-Aside for all emissions from the CHP plant and that it be based on the following Relevant Emission:

EPA total projected¹ tonnes CO₂/annum for the installation:

Unit	2009	2010	2011	2012
Boilers	391	2,493	1,488	1,600
Emergency Generators	0	0	48	48
CHP Electricity	0	5,535	8,962	8,987
CHP Heat	0	17	1,116	1,112
Total	391	8,045	11,614	11,747

¹ Historical data has been used where appropriate

Signed:

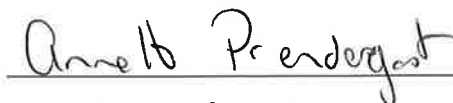


Marc Kierans

Inspector

Date: 31 August 2012

Reviewed:



Annette Prendergast

Acting Senior Manager

Date: 31 August 2012

