

Meath Facility - 2015 EPA Submission

Total waste treated 01/01/15 to 31/12/15	227524	Tonnes
Total electricity produced 01/01/15 to 31/12/15	151608	MWh

	Type of energy	Unit	Tonne	NCV (kJ/kg)	Energy (MWh)
1.1	Adjusted amount incinerated waste		224,632	9,460	590,283
1.2	Amount sewage sludge		-	-	-
1.3	Amount used activated carbon		-	-	-
2	E_w Energy input of waste	MWh			590,283
2.1 + 2.2	Ef: Light fuel oil used for startup / keeping temperature	tonne	179.6	42,000	2,095
2.3	Ef: Natural gas used		-	-	-
3	Ef: Energy input by imported energy with steam	MWh			2,095
3.1	Ei: Light fuel oil used for startup / shutdown	tonne	179.6	42,000	2,095
3.2	Ei: Natural gas used		-	-	-
3.3	Ei: imported electricity (multiplied with equivalence factor 2.6)		-	-	-
3.4	Ei: imported heat		-	-	-
4	Ei: Energy input by imported energy without steam	MWh			2,095
4.1	Ep: Adjusted electricity produced and internally used for incineration process	MWh	16,202.00	-	151,405
4.2	Ep: electricity delivered to a third party	MWh	135,406.00	-	-
5	Ep: Electricity produced	MWh	151,506.40		151,404.80
5.1 + 5.2	Ep: Heat exported	MWh	-	-	-
6	Ep: Heat exported	MWh			-
6.1 to 6.3	Ep: heat used internally for steam driven pumps, backflow, heating flue gas, liquid APC residues		-	-	-
6.4	Ep: for soot blowing without backflow		-	-	-
6.5 to 6.7	Ep: for heating buildings, deaeration, NH4OH injection		-	-	-
7	Ep: Heat used internally	MWh			-
	Ep	MWh			393,652
	R1				0.678
	R1 with Climate Correction				0.77

$$\text{Energy efficiency} = \frac{E_p - (E_f + E_i)}{0.97 * (E_w + E_f)}$$

In which:

E_p means annual energy produced as heat or electricity. It is calculated with energy in the form of electricity being multiplied by 2.6 and heat produced for commercial use multiplied by 1.1 (GJ/year)

E_f means annual energy input to the system from fuels contributing to the production of steam (GJ/year)

E_w means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year)

E_i means annual energy imported excluding *E_w* and *E_f* (GJ/year)

0.97 is a factor accounting for energy losses due to bottom ash and radiation

In addition, Annex II of the WFD highlights that this formula shall be applied in accordance with the Reference Document on Best Available Techniques for Waste Incineration (BREF WI).

R1 Adjustments: Curtailment

Objective: Omit periods where NCC constrains / curtails plant as energy must be spilt during these periods.

Data affected: MWh produced, waste tonnes processed

Obtaining data: MWh produced and waste treated during constraints from NCC

affect of data Tonnes of waste in 1.1 reduced to exclude constraint periods

Ep Electricity produced in 5 reduced by electricity produced during constraint

Frequency of processing data: monthly

Curtailment

	MWh	t waste
Jan-15	6	164
Feb-15	0	0
Mar-15	3.5	76
Apr-15	0	
May-15	0	0
Jun-15	0	0
Jul-15	6	171
Aug-15	6	159
Sep-15	1	26
Oct-15	9	240
Nov-15	16.3	457
Dec-15	53.8	1,598
Total	101.6	2892

Total waste treated 01/01/15 to 31/12/15	227524	Tonnes
Total electricity produced 01/01/15 to 31/12/15	151608	MWh

	Type of energy	Unit	Tonne	NCV (kJ/kg)	Energy (MWh)
1.1	Adjusted amount incinerated waste		224,632	9,460	590,283
1.2	Amount sewage sludge		-	-	-
1.3	Amount used activated carbon		-	-	-
2	E_w Energy input of waste	MWh			590,283
2.1 + 2.2	Ef: Light fuel oil used for startup / keeping temperature	tonne	179.60	42,000	2,095
2.3	Ef: Natural gas used	-	-	-	-
3	Ef: Energy input by imported energy with steam	MWh			2,095
3.1	Ei: Light fuel oil used for startup / shutdown	tonne	179.60	42,000	2,095
3.2	Ei: Natural gas used	-	-	-	-
3.3	Ei: imported electricity (multiplied with equivalence factor 2.6)	-	-	-	-
3.4	Ei: imported heat	-	-	-	-
4	Ei: Energy input by imported energy without steam	MWh			2,095
4.1	Ep: Adjusted electricity produced and internally used for incineration process	MWh	16,202.00	-	150,523
4.2	Ep: electricity delivered to a third party	MWh	135,406.00	-	
5	Ep: Electricity produced	MWh	151,065.38		150,522.75
5.1 + 5.2	Ep: Heat exported	MWh	-	-	-
6	Ep: Heat exported	MWh			-
6.1 to 6.3	Ep: heat used internally for steam driven pumps, backflow, heating flue gas, liquid APC residues		-	-	-
6.4	Ep: for soot blowing without backflow		-	-	-
6.5 to 6.7	Ep: for heating buildings, deaeration, NH4OH injection		-	-	-
7	Ep: Heat used internally	MWh			-

R

Objective:
Data affected:
Obtaining data:
affect of data

Frequency of proc

Ep	MWh				391,359
R1					0.674
R1 with Climate Correction					0.77

$$\text{Energy efficiency} = \frac{E_p - (E_f + E_i)}{0.97 * (E_w + E_f)}$$

In which:

E_p means annual energy produced as heat or electricity. It is calculated with energy in the form of electricity being multiplied by 2.6 and heat produced for commercial use multiplied by 1.1 (GJ/year)

E_f means annual energy input to the system from fuels contributing to the production of steam (GJ/year)

E_w means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year)

E_i means annual energy imported excluding E_w and E_f (GJ/year)

0.97 is a factor accounting for energy losses due to bottom ash and radiation

In addition, Annex II of the WFD highlights that this formula shall be applied in accordance with the Reference Document on Best Available Techniques for Waste Incineration (BREF WI).

Net Usable Energy Per Tonne of Waste Processed

0.670 MWh/Tonne

1.1 Adjustments: Curtailment

Omit periods where NCC constrains / curtails plant as energy must be spilt during these periods.

MWh produced, waste tonnes processed

MWh produced and waste treated during constraints from NCC

Tonnes of waste in 1.1 reduced to exclude constraint periods

Ep Electricity produced in 5 reduced by electricity produced during constraint

Processing data: monthly

Curtailment

	MWh	t waste
Jan-15	25	164
Feb-15		0
Mar-15	14	76
Apr-15		
May-15		0
Jun-15		0
Jul-15	57	171
Aug-15	28	159
Sep-15	8	26
Oct-15	40	240

Nov-15	71	457
Dec-15	300	1,598
Total	543	2892