NOTIFICATION OF EXEMPTIONS FROM ARTICLE 14(6) OF DIRECTIVE 2012/27/EU

General

This notification was drawn up by the Directorate for Electricity Production and the Directorate for Energy Saving and Efficiency of the Ministry of the Environment, Energy and Climate Change (MEECC), with the support of the Centre for Renewable Energy Sources (CRES) and the working group set up to harmonise national legislation with Directive 2012/27/EU (ΑΔΑ: ΒΛ170-4Μ5), using data from the General Secretariat for Industry, the operators of existing district heating networks and the Public Power Corporation (PPC).

We hereby notify to the European Commission the criteria for exemption from the obligation to carry out a cost–benefit analysis for the use of waste heat in accordance with Article 14(5) and (6) of Directive 2012/27/EU. This analysis relates either to new installations or substantially refurbished existing units, i.e. the cost of refurbishment exceeds 50 % of the investment cost for a comparable new unit.

Exceptions under Article 14(6)

1. **Electricity generating installations**

   We plan to exempt peak load and back-up electricity generating installations which are planned to operate under 1 500 hours per year as a rolling average over a period of five years.

2. **Industrial installations with a rated heat output exceeding 20 MW (Article 14(5)(c) and (d)).**

   As regards the connection of the industrial installation to an existing district heating/cooling network, we plan to exclude installations located at a distance of over 60 km from the network, and those where the ratio of annual waste heat in GWh to the distance in km from the network is less than 1.5, in accordance with the analysis given in the Annex.

   As regards the use of waste heat to satisfy economically justified demand through cogeneration or other forms of utilisation, the minimum thresholds for exempting installations are not specified in this notification. However, these are expected to be decided by 31 December 2015 in the course of assessment of the potential for the application of high-efficiency cogeneration required by Article 14(1).

Annex

Exemption of industrial installations with a rated heat output exceeding 20 MW from the obligation to carry out a cost–benefit analysis of the utilisation of waste heat and connection to an existing district heating/cooling network

We plan to exempt from the requirement of a cost-benefit analysis those industrial installations with a heat output of over 20 MW that have waste heat at a useful temperature level, where the ratio of annual waste heat in GWh to the distance in km from an existing district heating/cooling network is less than **1.5**. A basic precondition is that the additional demand for heat from district heating networks be greater than or equal to the available waste heat from the industrial installations.

This is based on analysis of the financial viability of potential investment in connecting industrial installations to existing district heating/cooling networks. For assessment of the economic viability of investment we use the internal rate of return (IRR). The lifetime of the investment is set at 20 years, and the minimum desired internal rate of return on the investment is set at **12 %**, taking into account current economic conditions.

To establish the flow of investment we have taken into account the costs as a function of the distance between the industrial installation and the existing district heating/cooling network and revenue from the sale of the available waste heat from the industrial installations to the district heating/cooling network.

Investment costs

The unit cost of installing the network for transmitting waste heat from the industrial installation to the district heating/cooling network is 230 euro/metre, calculated on the basis of the corresponding cost of developing the existing district heating networks now in operation. This includes the cost of purchasing the pipelines and the cost of all the work to install them.

The investment cost of the other systems/works (e.g. engineering studies, supervision, pumping stations, contingencies, etc.) is estimated at 8 % of the total cost of installing the transmission network.

In accordance with the above, the investment cost is based on the following equation:

$$C_i = C_n + C_r \qquad (1)$$

with

$$C_n = X \times 10^3 \times 230$$

$$C_r = 0.08\ C_n$$

therefore

$$C_i = 1.08 \times X \times 10^3 \times 230 \qquad (2)$$

where
C_i: Total cost of investment (in euro)
C_n: Cost of the transmission network (in euro)
C_r: Cost of other systems/works (in euro)
X: Distance from the district heating network (in km)

Annual maintenance and operating costs

Taken as 1 % of the cost of investment:

$$C_{o\&m} = 0.01 \times C_i \qquad (3)$$

Annual revenue from the sale of heat

The selling price of the heat supplied is set at 70 % of the current minimum selling price of existing district heating networks. According to existing invoices for the sale of heat to consumers by the public district heating networks, the minimum selling price is 43 euro/MWh. Therefore, the selling price of the heat is calculated at 30 euro/MWh.

The annual revenue from the sale of heat is:

$$I = 30 \times Q_{th} \qquad (4)$$

where
I : Annual revenue (in euro)
Q_{th} : Annual waste heat (in MWh)

The table below shows the aggregate flows of investment from the above analysis as a function of the distance (x) and the available waste heat (Q_{th}).

Cashflow	**Equation**
Cost of investment (in euro)	$C_i = 1.08 \times X \times 10^3 \times 230$
Annual investment maint. & op. (in euro)	$C_{o\&p} = 0.01 \times C_i$
Annual revenue (in euro)	$I = 30 \times Q_{th}$

The next table shows the change in the internal rate of return on the investment as a function of the distance and the available waste heat.

		Q_{th} : Available waste heat (in GWh)											
		5	10	15	20	25	30	35	40	45	50	55	60
X: Distance (km)	1	59 %	119 %										
	2	29 %	59 %	89 %									
	3	18 %	39 %	59 %	9 %								
	4	13 %	29 %	44 %	59 %	74 %							
	5	9 %	23 %	35 %	47 %	59 %	71 %	83 %					
	10	0 %	9 %	16 %	23 %	29 %	35 %	41 %	47 %	53 %	59 %		
	15	-4 %	3 %	9 %	14 %	18 %	23 %	27 %	31 %	35 %	39 %	43 %	47 %
	20		0 %	5 %	9 %	13 %	16 %	19 %	23 %	26 %	29 %	32 %	35 %
	25		-2 %	2 %	6 %	9 %	12 %	15 %	18 %	20 %	23 %	25 %	28 %
	30			0 %	3 %	6 %	9 %	12 %	14 %	16 %	18 %	21 %	23 %
	35			-2 %	2 %	4 %	7 %	9 %	11 %	13 %	15 %	17 %	19 %
	40				0 %	3 %	5 %	7 %	9 %	11 %	13 %	14 %	16 %
	45				-1 %	1 %	3 %	5 %	7 %	9 %	11 %	12 %	14 %
	50					0 %	2 %	4 %	6 %	8 %	9 %	11 %	12 %
	55					-1 %	1 %	3 %	5 %	6 %	8 %	9 %	10 %
	60						0 %	2 %	3 %	5 %	6 %	8 %	9 %
Waste heat (in GWh)		5	10	15	20	25	30	35	40	45	50	55	60
Distance from district heating network (in km)		4	8	10	15	20	25	30	30	35	40	45	50
Waste heat/distance ratio		1.25	1.25	1.50	1.33	1.25	1.20	1.17	1.33	1.29	1.25	1.22	1.20
											max		1.5

As can be seen from the above table, when the waste heat/distance ratio increases, the investment becomes more cost-effective. In each of the cases examined we have identified the minimum ratio that ensures a minimum internal rate of return (IRR = 12 %), which is the criterion for exemption (1.5 GWh/km).

The price resulting from this methodological approach may be recalculated during the preparation of the comprehensive assessment of the potential for efficient heating and cooling, when the data necessary for a more detailed analysis of the systems will be compiled and assessed.