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COMMISSION DELEGATED REGULATION (EU) 2023/2104

of 4 July 2023

amending Delegated Regulation (EU) 2015/2402 as regards the review of harmonised efficiency reference values for separate production of electricity and heat in application of Directive 2012/27/EU of the European Parliament and of the Council

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC ([1]), and in particular the second subparagraph of Article 14(10) thereof,

Whereas:

(1) Delegated Regulation (EU) 2015/2402 ([2]) established reviewed harmonised efficiency reference values for the separate production of electricity and heat, as a matrix of values differentiated by relevant factors, including year of construction and types of fuel and complemented with correction factors with regards to average climatic situation and avoided grid losses.

(2) The Commission carried out a review of those harmonised efficiency reference values ('the review') for the separate production of electricity and heat taking into account data from operational use under realistic conditions, provided by Member States and by stakeholders. As a result of developments in the best available and economically justifiable technology, observed during the review period from 2016 to 2021, the distinction drawn in Delegated Regulation (EU) 2015/2402 relating to the year of construction of a cogeneration unit should be maintained in relation to the harmonised efficiency reference values for separate production of electricity.

(3) The review showed a need to include new fuels and emerging technologies that might be used more broadly or introduced in cogeneration. Therefore, the list of energy sources with specific reference values should be extended to include e-gases and traded hydrogen as well. As regards traded hydrogen, separate reference values should be set to increase the efficiency of hydrogen use in large cogeneration units.

(4) The review supports the use of a single reference value for the separate production of electricity for all fossil fuels, based on natural gas use in combined cycle gas turbine power stations. The building of new cogeneration units using liquid or solid fossil fuels is not in conformity with the long-term energy and climate policy objectives of the Union. Therefore, in order to avoid retroactive changes for current schemes, the reference values should be updated and be applicable to the new and substantially refurbished cogeneration units consuming fossil fuels put into operation from 1 January 2024.

(5) The review showed that the harmonised efficiency reference values for the separate production of heat should be changed only as regards fossil fuels. The new set of reference values for fossil fuels are established on the basis of heat-only boilers using natural gas and should be applicable to new or substantially refurbished units for separate production of heat completed as from 1 January 2024.

(6) It is necessary to have stable conditions for investment in cogeneration, and continued investor confidence, therefore it is appropriate to fix harmonised reference values for electricity and heat.

([1]) OJ L 315, 14.11.2012, p. 1.

([2]) Commission Delegated Regulation (EU) 2015/2402 of 12 October 2015 reviewing harmonised efficiency reference values for separate production of electricity and heat in application of Directive 2012/27/EU of the European Parliament and of the Council and repealing Commission Implementing Decision 2011/877/EU (OJ L 333, 19.12.2015, p. 54).

(7) One of the objectives of Directive 2012/27/EU is to promote cogeneration in order to save energy, therefore an incentive should be granted for retrofitting older cogeneration units in order to improve their energy efficiency. In order to provide such incentive, and in conformity with the requirement for the harmonised efficiency reference values to be based on the principles set out in point (f) of Annex II to Directive 2012/27/EU, the efficiency reference values for electricity applicable to a cogeneration unit should increase from the eleventh year after the year of its construction following the rules in Article 3(2) of Delegated Regulation (EU) 2015/2402.

(8) Thermal generation is becoming increasingly important for energy system security, resiliency and flexibility. The operation of some cogeneration systems may change to provide security of supply, flexibility or ancillary services to the electricity system, depending on the application. Future revisions of Delegated Regulation (EU) 2015/2402 shall explore the evolution of efficiency levels, as thermal power plants must adapt their operation to become more flexible in response to renewable power intermittency and demand-side electrification.

(9) Delegated Regulation (EU) 2015/2402 should therefore be amended accordingly,

HAS ADOPTED THIS REGULATION:

Article 1

Delegated Regulation (EU) 2015/2402 is amended as follows:

Annexes I and II are replaced by the text in Annex I to this Regulation;

Annex IV is replaced by the text in Annex II to this Regulation.

Article 2

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

It shall apply from 1 January 2024.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 4 July 2023.

For the Commission
The President
Ursula VON DER LEYEN

ANNEX I

'ANNEX I

Harmonised efficiency reference values for separate production of electricity

(referred to in Article 1)

In the following table, the harmonised efficiency (%) reference values for separate production of electricity are based on net calorific value and standard atmospheric ISO conditions (15 °C ambient temperature, 1,013 bar, 60 % relative humidity):

	Category	Energy source	Year of construction		
			Before 2016	2016–-2023	From 2024
Solids	S1	Hard coal including anthracite, bituminous coal, sub-bituminous coal, coke, semi-coke, pet coke	44,2	44,2	53,0
	S2	Lignite, lignite briquettes, oil shale	41,8	41,8	53,0
	S3	Peat, peat briquettes	39,0	39,0	53,0
	S4	Dry biomass including wood and other solid biomass including wood pellets and briquettes, dried woodchips, clean and dry waste wood, nut shells and olive and other stones	33,0	37,0	37,0
	S5	Other solid biomass including all wood not included under S4 and black and brown liquor.	25,0	30,0	30,0
	S6	Municipal and industrial waste (non-renewable, of non-biological origin such as plastics, rubber and other synthetic materials) and renewable/bio-degradable waste	25,0	25,0	25,0
Liquids	L7	Heavy fuel oil, gas/diesel oil, other oil products	44,2	44,2	53,0
	L8	Bio-liquids including bio-methanol, bioethanol, bio-butanol, biodiesel, other biofuels and all e-liquids	44,2	44,2	44,2
	L9	Waste liquids including biodegradable and non-renewable waste (including tallow, fat and spent grain).	25,0	29,0	29,0
Gaseous	G10	Natural gas, LPG, LNG and biomethane	52,5	53,0	53,0
	G11A	Traded hydrogen ([1])	44,2	44,2	53,0
	G11B	Refinery gases, synthesis gas, hydrogen (by-product), e-gases ([2])	44,2	44,2	44,2
	G12	Biogas produced from anaerobic digestion, landfill, and sewage treatment	42,0	42,0	42,0
	G13	Coke oven gas, blast furnace gas, mining gas, and other recovered gases (excluding refinery gas)	35,0	35,0	35,0

Other	O14A	Waste heat, including process exhaust gases, product from exothermic chemical reactions (input temperature > 200 °C)		30,0	30,0
	O14B	Waste heat, including process exhaust gases, product from exothermic chemical reactions (input temperature < 200 °C)		30,0	20,0
	O15	Nuclear		33,0	33,0
	O16	Solar thermal		30,0	30,0
	O17	Geothermal		19,5	19,5
	O18	Other fuels not mentioned above		30,0	30,0

([1]) Hydrogen sold from its supplier to a cogeneration unit operator.
([2]) E-gases are understood as gaseous synthetic fuel originating from renewable hydrogen and carbon dioxide captured either from a concentrated source, such as flue gases from an industrial site, or from the air.

ANNEX II

Harmonised efficiency reference values for separate production of heat

(referred to in Article 1)

In the following table the harmonised efficiency (%) reference values for separate production of heat are based on net calorific value and standard atmospheric ISO conditions (15 °C ambient temperature, 1,013 bar, 60 % relative humidity):

Category		Energy source	Year of construction								
			Before 2016			2016–2023			From 2024		
			Hot water	Steam[1]	Direct use of exhaust gases [2]	Hot water	Steam[1]	Direct use of exhaust gases [2]	Hot water	Steam[1]	Direct use of exhaust gases [2]
Solids	S1	Hard coal including anthracite, bituminous coal, sub-bituminous coal, coke, semi-coke, pet coke	88	83	80	88	83	80	92	87	84
	S2	Lignite, lignite briquettes, oil shale	86	81	78	86	81	78	92	87	84
	S3	Peat, peat briquettes	86	81	78	86	81	78	92	87	84
	S4	Dry biomass including wood and other solid biomass including wood pellets and briquettes, dried woodchips, clean and dry waste wood, nut shells and olive and other stones	86	81	78	86	81	78	86	81	78
	S5	Other solid biomass including all wood not included under S4 and black and brown liquor.	80	75	72	80	75	72	80	75	72
	S6	Municipal and industrial waste (non-renewable, of non-biological origin such as plastics, rubber and other synthetic materials) and renewable/bio-degradable waste	80	75	72	80	75	72	80	75	72
Liquids	L7	Heavy fuel oil, gas/diesel oil, other oil products	89	84	81	85	80	77	92	87	84
	L8	Bio-liquids including bio-methanol, bioethanol, bio-butanol, biodiesel, other biofuels and all e-liquids	89	84	81	85	80	77	85	80	77

	L9	Waste liquids including biodegradable and non-renewable waste (including tallow, fat and spent grain).	80	75	72	75	70	67	75	70	67
Gaseous	G10	Natural gas, LPG, LNG and biomethane	90	85	82	92	87	84	92	87	84
	G11A	Traded hydrogen	89	84	81	90	85	82	92	87	84
	G11B	Refinery gases, synthesis gas, hydrogen (by-product), e-gases	89	84	81	90	85	82	90	85	82
	G12	Biogas produced from anaerobic digestion, landfill, and sewage treatment	70	65	62	80	75	72	80	75	72
	G13	Coke oven gas, blast furnace gas, mining gas, and other recovered gases (excluding refinery gas)	80	75	72	80	75	72	80	75	72
Other	O14A	Waste heat, including process exhaust gases, product from exothermic chemical reactions (input temperature > 200 °C)	—	—	—	92	87	—	92	87	—
	O14B	Waste heat, including process exhaust gases, product from exothermic chemical reactions (input temperature < 200 °C)	—	—	—	92	87	—	92	87	—
	O15	Nuclear	—	—	—	92	87	—	92	87	—
	O16	Solar thermal	—	—	—	92	87	—	92	87	—
	O17	Geothermal	—	—	—	92	87	—	92	87	—
	O18	Other fuels not mentioned above	—	—	—	92	87	—	92	87	—

([1]) Where steam plants do not account for the condensate return in their calculation of CHP heat efficiencies, the steam efficiencies set out in the table should be increased by 5 percentage points.
([2]) Values for direct heat should be used where the temperature reaches 250 °C or higher.'.

ANNEX II

'ANNEX IV

Correction factors for avoided grid losses for the application of the harmonised efficiency reference values for separate production of electricity

(referred to in Article 2(2))

Connection voltage level	Correction factor (Off-site)	Correction factor (On-site)
≥ 345 kV	1	0,976
≥ 200 – < 345 kV	0,972	0,963
≥ 100 – < 200 kV	0,963	0,951
≥ 50 – < 100 kV	0,952	0,936
≥ 12 – < 50 kV	0,935	0,914
≥ 0,45 – < 12kV	0,918	0,891
< 0,45 kV	0,888	0,851

Example:

A 100 kWel cogeneration unit with a reciprocating engine driven with natural gas generates electricity at 380 V. Of this, 85 % is used for own consumption and 15 % is fed into the grid. The plant was constructed in 2020. The annual ambient temperature is 15 °C (so no climatic correction is necessary).

After the grid loss correction the resulting efficiency reference value for the separate production of electricity in this cogeneration unit would be, on the basis of the weighted mean of the factors in this Annex:

$$\text{Ref } E\eta = 53\ \% \times (0{,}851 \times 85\ \% + 0{,}888 \times 15\ \%) = 45{,}4\ \%'.$$