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Guidance on heating and cooling aspects in Articles 15a, 22a, 23 and 24 of Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources as amended by Directive (EU) 2023/2413

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1. INTRODUCTION

Directive (EU) 2023/2413 of the European Parliament and of the Council ([1]), which amends Directive (EU) 2018/2001 of the European Parliament and of the Council ([2]), entered into force on 20 November 2023, introducing changes to the legislative framework regulating renewable energy until 2030 and beyond. This guidance refers to the 2018 Renewable Energy Directive as REDII and to the amended Renewable Energy Directive as revised RED or revised Directive.

The revision of the Renewable Energy Directive is a cornerstone of the European Green Deal and REPowerEU strategies in order to reach the Union's ambition to fight climate change and reduce the Union's energy dependence from Russia. The revised RED increases substantially the level of renewable energy ambition, not only by increasing the Union renewable energy binding target that needs to be collectively achieved by 2030 from 32% to 42.5% (with an aspiration to reach 45%), but also by adding and strengthening the sub-targets for renewables to be achieved in various sectors, including the heating and cooling sector.

Heating and cooling represent about half of the energy consumption in the Union. The share of renewable energy in this sector has increased more slowly than in electricity generation, and most of it still comes from biomass.

In order to ramp up the decarbonisation of heating and cooling, the revised Directive has strengthened the existing provisions to promote the deployment of renewable energy in the heating and cooling and district heating and cooling sectors (Articles 23 and 24, respectively) by introducing new obligations and measures. The revised Directive has also introduced two new provisions to foster the production and use of renewable energy in the buildings and industry sectors (new Articles 15a and 22a, respectively), both of which are closely linked to the heating and cooling provisions.

Table 1 gives a general overview of how the different heating and cooling related targets are structured. This Communication aims to facilitate the implementation of the new obligations and measures contained in these provisions by providing clarifications regarding in particular the scope, structure and accounting of the targets referred to in Articles 15a, 22a, 23 and 24 of the revised Directive, and the definition of 'waste heat and cold' contained in Article 2(9). Some obligations pertain to new reporting requirements on energy statistics. Although the first reference year for official reporting in SHARES based on the revised RED will be 2025, Member States may already use the draft version of the updated SHARES tool for this calculation well in advance of 21 May 2025, the transposition date of the revised RED. Box 1 elaborates on this.

This Communication is intended purely as a guidance document for the purposes of transposing and implementing the revised RED. It does not provide interpretation in the context of other legal acts.

([1]) Directive (EU) 2023/2413 of the European Parliament and the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 (OJ L, 2023/2413, 31.10.2023, ELI: http://data.europa.eu/eli/dir/2023/2413/oj).

([2]) Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (OJ L 328, 21.12.2018, p. 82).

Only the text of the EU legislation itself has legal force. Any authoritative reading of the law has to be derived from the text of the Directive and directly from the decisions of the Court of Justice of the EU.

Table 1. General overview of heating and cooling related renewable energy targets in the revised RED

Article	**15a**	**22a**	**23**	**24**
Sector	Buildings	Industry	Heating and cooling	District heating and cooling
Target type	Indicative national share to be determined by Member States	Indicative annual average increase	Annual average increase	Indicative annual average increase
Target period	In 2030	2021-2025 and 2026-2030 compared to 2020	2021-2025 and 2026-2030 compared to 2020	2021-2030 compared to 2020
Target level	In line with 49% Union level	1.6 percentage points	0.8 percentage points and 1.1 percentage points + Indicative top-up	2.2 percentage points
Energy type	Renewable energy produced on-site + Renewable energy produced nearby + Renewable energy taken from the grid	Renewable energy	Renewable energy	Renewable energy + Waste heat and cold
Consumption type	Final energy	Final energy and non-energy	Gross final energy	Gross final energy
Flexibility	Waste heat and cold	Waste heat and cold from efficient district heating and cooling	Waste heat and cold + Renewable electricity from heat and cold generator with >100% efficiency	Renewable electricity

Box 1. Role of Eurostat and SHARES tool

Progress towards the Union renewable energy target set out in Article 3 and the sectoral breakdowns in Article 7 (in electricity, heating and cooling and transport) is reported under the SHARES tool developed by Eurostat.

At the date of entry into force of the revised RED, SHARES is being extended to the district heating and cooling, buildings and industry sectors in order to provide consistent and comparable data that can be used to assess the progress towards the targets in Articles 24, 15a and 22a respectively. However, the data reported to

Eurostat is not yet comprehensive for all indicators, therefore requiring the use of proxies in some cases. This is described in individual sections.

The SHARES tool provides insight in a wide array of indicators which can be used for different requirements, for example waste heat consumed in district heating and cooling for the purpose of the target in Article 24 or the level of self-consumption in buildings for the purpose of the target in Article 15a. Such granularity however is dependent on Member States' submission of the corresponding data to Eurostat. They are therefore encouraged to do so to prevent Eurostat having to rely on proxies.

2. WASTE HEAT AND COLD DEFINITION IN THE RENEWABLE ENERGY DIRECTIVE

The Renewable Energy Directive defines waste heat and cold in Article 2(9) as follows: '*unavoidable heat or cold generated as by-product in industrial or power generation installations, or in the tertiary sector, which would be dissipated unused in air or water without access to a district heating or cooling system, where a cogeneration process has been used or will be used or where cogeneration is not feasible*'. While the definition of waste heat and cold has not been modified in the revised RED and it was already possible to count waste heat and cold in addition to renewable energy towards the fulfilment of the heating and cooling targets, it is appropriate to clarify the scope of this definition for the purposes of the measures included in Articles 15a, 22a, 23 and 24 of the revised RED. The role of waste heat is underlined in recital 70, which states that '*it is appropriate to allow waste heat and cold to count towards partial fulfilment of the targets for renewable energy in buildings, industry, heating and cooling and towards complete fulfilment of the targets for district heating and cooling'.*

For a heat or cold stream to be considered as waste heat or cold in order to contribute to the fulfilment of the RED targets, the following four cumulative criteria need to be met:

- First, waste heat and cold should be '*unavoidable'*. This means that it cannot reasonably (technically and economically) be avoided or internally consumed or reduced (at all stages) through technical and energy efficiency improvements. As an example, excess heat and cold reused inside a plant is accounted as an energy efficiency improvement and therefore cannot be considered waste heat.

- Second, the generation of waste heat and cold should be a '*by-product'*. This means that the primary aim of the process should not be to generate that specific fraction of heat and cold. For example, the direct heat output of a cogeneration process, whose primary purpose is to co-produce heat and electricity, does not constitute waste heat for the purpose of RED accounting ([3]). However, some other heat streams of cogeneration processes, such as excess heat extracted from the condenser, in some specific cases could fulfil the criteria of unavoidability and by-product. When applying this criterion to the incineration and co-incineration of waste Member States shall apply the same approach. When the production of

([3]) This is defined as 'useful heat' in Article 2(38) of the EED

energy (heat) is the primary purpose of the incineration or co-incineration process, it does not satisfy the by-product criterion. In order to determine whether the heat is a by-product, Member States may for example refer to the purpose of the installation or to the type of operating permit obtained by the plant ([4]).

- Third, the generation of waste heat and cold should take place in '*industrial or power generation installations, or in the tertiary sector'*. This excludes for example heat generated by residential cooling.

- Fourth, the heat or cold *'would be dissipated unused … without access to a district heating or cooling system'*. This means that the heat or cold stream has to be delivered to a district heating or cooling system. Excess heat recovery without access to a district heating or cooling system, for instance on-site or to a single building cannot be accounted for the purposes of RED.

Finally, in addition to these four cumulative criteria, for a heat or cold stream to be considered as waste heat or cold and contribute to the fulfilment of the RED targets, the definition states an overall requirement to always consider '*cogeneration'* of both electricity and heat before resorting to heat only production. To ascertain whether cogeneration is feasible, Member States can use an energy audit as defined by Article 2(32) of Directive (EU) 2023/1791 (EED) or a Cost-Benefit Analysis as required by Article 26(7) of the EED.

This part of the definition refers to three cases: '*where a cogeneration process has been used or will be used or where cogeneration is not feasible*'. The first case refers to waste heat as an (unavoidable by-product) output of cogeneration. The second case refers to waste heat as input to a cogeneration process – in such a case, the waste heat stream may only be accounted once, either before or after the cogeneration process (provided it complies with all the criteria as outlined above). The third case refers to situations where it has been assessed that cogeneration is not feasible.

Annex A lists several examples of what may qualify as waste heat and what may not.

It should be noted that n the revised RED, waste heat and cold may contribute as a flexibility towards the fulfilment of the renewable energy targets in Articles 15a, 22a, 23 and 24, without disincentivising the promotion of renewables.

This guidance aims to provide clarity regarding the waste heat and cold definition specifically and only for the purpose of ensuring a uniform transposition and implementation of the revised RED across all Member States. This will also provide legal certainty to the industry, power and tertiary sectors as to what may be accounted as waste heat and cold for the purposes of the revised RED. This guidance interprets the relevant provisions in the context of RED. It does not provide interpretation in the context of other legal acts.

([4]) Waste incineration and waste co-incineration are covered by the Industrial Emissions Directive (IED) and by the best available techniques (BAT) conclusions for waste incineration, when the activity is listed in IED Annex I. Specific references that may be used to determine whether heat qualifies as a by-product include in particular the definitions of waste incineration and co-incineration plants in the Industrial Emissions Directive and the Waste Framework Directive.

This guidance builds on the JRC Technical Report on *Defining and accounting for waste heat and cold ([5]).* For additional background and technical explanations, revert to the report.

3. ACCOUNTING THE SHARE OF RENEWABLE ENERGY IN ARTICLE 23

3.1. General overview of Article 23

Article 23 of the revised RED includes the following obligations and measures:

- Paragraphs 1, 1a and 1b set renewable energy targets to be achieved in the heating and cooling sector by 2030 (split in two periods) in terms of gross final energy consumption. They furthermore state how waste heat and cold may be accounted towards those targets. They also indicate how renewable electricity may be accounted towards the targets, provided that it is used in units with an efficiency exceeding 100% (e.g., heat pumps). They also oblige Member States to carry out an assessment of the potential to use renewable energy and waste heat and cold in their heating and cooling sector.

- Paragraph 2 provides flexibility for Member States who achieve significant levels of renewable energy in their heating and cooling sector. More particularly, it sets specific threshold levels of renewable energy that allow Member States to fulfil (fully or partially) the target set in paragraph 1. It grants leeway in the methods chosen to adopt in order to deploy renewable energy in areas where there are structural barriers arising from high shares of natural gas or cooling or with low population densities. It furthermore obliges Member States to disclose if their chosen measures will not be sufficient to achieve their target. It also obliges Member States to provide information on measures and financial instruments to improve renewable energy in heating and cooling systems through accessible and transparent tools.

- Paragraph 3 states that Member States may make public a list of measures and may designate and make public the implementing entities which could contribute to the target set in paragraph 1. Paragraphs 5 and 6 explain how those measures could be implemented and monitored and which data must be reported by the implementing entities that Member States may have created.

- Paragraph 4 finally provides a list of measures, of which Member States must endeavour to implement at least two, that can contribute to the target set in paragraph 1. The chosen measures must be accessible to all consumers.

3.2. New elements of Article 23

The revised RED includes the following important modifications to strengthen Article 23:

- The main part of the heating and cooling target (i.e., the average annual increase of the share of renewable energy in the heating and cooling sector over two periods) is now mandatory.

([5]) JRC Publications Repository - Defining and accounting for waste heat and cold (europa.eu)

- In addition, paragraph 1 now requires Member States to endeavour to increase their annual average by an additional amount described in Annex Ia for each Member State. Compliance with these top-ups would result in an EU-wide average annual increase of 1.8 percentage points over both periods.

- The share of renewable energy now needs to be expressed in terms of gross final energy consumption instead of final energy consumption. This will however not alter any reporting requirements for Member States given that both REDII and the revised RED mention the obligation to calculate the share in accordance with the methodology set out in Article 7, which has not changed and requires the share to be calculated in terms of gross final energy consumption. The mismatch in REDII, between final energy consumption and the calculation in accordance with Article 7 (which is in terms of gross final energy consumption), has therefore been corrected.

- The flexibility to count waste heat and cold towards the average annual increase has become more restrictive (i.e., a smaller percentage is allowed), but renewable electricity used for heating and cooling may now also be partly counted towards the average annual increase.

- Member States are required to carry out an assessment of the potential to use renewable energy and waste heat and cold in their heating and cooling sector ([6]). The revised RED introduces further requirements regarding the content of such assessment.

- The list of options to ensure the average annual increase is achieved has been extended and Member States now are required to endeavour the implementation of at least two of these options.

3.3. Annual average increase

Article 23(1) of the revised RED introduces the obligation to increase the share of renewable energy in the heating and cooling sector, which was only voluntary under REDII.

Member States are required to increase the share of renewable energy in the heating and cooling sector as follows: for the years 2021-2025 by an average of 0.8 percentage points per year and for the years 2026-2030 by an average of 1.1 percentage points per year. In order to calculate such increase, Member States must use the methodology set out in Article 7 and must take their share of renewable energy in heating and cooling in 2020, as reported in EU statistics to Eurostat, as baseline figure ([7]).

The fulfilment of this obligation is verified in two moments: (i) after statistics for 2025 are available, when Member States must have achieved an average annual increase of the renewable energy share in this sector of at least 0.8 percentage points for the first period (2021-2025) and (ii) after statistics for 2030 are available, when Member States must have achieved a 1.1 percentage point average annual increase

([6]) This requirement has been moved from Article 15(7) in REDII to Article 23(1b) in the revised RED.

([7]) The sustainability and greenhouse gas emissions saving criteria for biofuels, bioliquids and biomass fuels have become more stringent in the revised RED. These new criteria yield lower values for renewable shares in some Member States. In 2020 however, REDI was in force which did not have these more stringent criteria. As a result, the renewable shares calculated under REDI should be used.

for the period 2026-2030. This means that they are allowed to achieve any year-on-year increase, as long as the average annual increase over each of the entire two periods is fulfilled.

Taking the example of a Member State that had a 2020 share of renewable energy in the heating and cooling sector of 40% the following result must be achieved: the renewable energy share in 2025 should be at least 4 percentage points higher than in 2020 (5 x 0.8) and in 2030 should be at least 9.5 percentage points higher than in 2020 (4 + 5 x 1.1). Table 2 gives a numerical example.

Table 2. Example of the resulting RES-shares to be achieved in 2025 and 2030

Annual increase		0.8%	0.8%	0.8%	0.8%	0.8%	1.1%	1.1%	1.1%	1.1%	1.1%
Year	2020	2021	2022	2023	2024	**2025**	2026	2027	2028	2029	**2030**
RES-share	40.0%	40.8%	41.6%	42.4%	43.2%	**44%**	45.1%	46.2%	47.3%	48.4%	**49.5%**

Article 23(2) provides flexibility for Member States who achieve significant levels of renewable energy in their heating and cooling sector. This flexibility has not been modified by the revised RED.

If in a certain year, a Member State's share of renewable energy in the heating and cooling sector reaches a level between 50% and 60%, then the required average annual increase for the next years is lowered by half. The average annual increase would therefore become at least 0.4 percentage points in any year of the period 2021-2025 (0.8/2) and 0.55 percentage points in any year of the period 2026-2030 (1.1/2. If in a certain year the fulfilment threshold value of 60% is reached and maintained above that threshold, then the average annual increase requirement for the next year is lowered to zero. Box 2 illustrates this with some examples.

Box 2. Examples of annual increases with different starting points in 2020, progressions over the periods 2021-2025 and 2026-2030 and required RES-H&C shares in 2025 and 2030.

1. *A Member State with a RES-H&C share of 20% in 2020 must reach a share of 24% at least in 2025 (20+5*0.8) and at least 29.5% in 2030 (24+5*1.1).*

2. *A Member State with a RES-H&C share of 48% in 2020 which reaches 50% in 2023 must reach a share of 51.2% at least in 2025 (full annual increase in the years until 2023, then half annual increase: 48+3*0.8+2*0.4) and at least 53.95% in 2030 (half annual increase over the second time period: 51.2+5*0.55).*

3. *A Member State with a RES-H&C share of 48% in 2020 which reaches 50% in 2024 must reach a share of 51.6% at least in 2025 (full annual increase in the years until 2024, then half annual increase: 48+4*0.8+1*0.4) and at least 54.35% in 2030 (half annual increase over the second time period: 51.2+5*0.55).*

4. *A Member State with a RES-H&C share of 48% in 2020 which decreases at one point during the period must still deliver the average annual increase over the five years, with 2020 as reference year.*

5. *A Member State with a RES-H&C share of 52% in 2020 must reach a share of 54% at least in 2025 (half annual increase over the full period: 52+5*0.4) and at least 56.75% in 2030 (half annual increase over the second time period).*

6. *A Member State with a RES-H&C share of 52% in 2020 which decreases below 50% in 2022 must still deliver the average half annual increase over the five years, with 2020 as reference year.*

7. *A Member State is deemed to fulfil its mandatory increase once it reaches a RES-H&C share of 60% and as long as it remains above 60%.*

	2020	2021	2022	2023	2024	**2025**	2026	2027	2028	2029	**2030**
1	**20**	20.8	21.6	22.4	23.2	**24**	25.1	26.2	27.3	28.4	**29.5**
2	**48**	48.8	49.6	50.4	50.8	**51.2**	51.75	52.3	52.85	53.4	**53.95**
3	**48**	45	47	49	51	**51.6**	52.15	52.7	53.25	53.8	**54.35**
4	**48**	45	48	50	50.5	**51.2**	51.75	52.3	52.85	53.4	**53.95**
5	**52**	52.4	52.8	53.2	53.6	**54**	54.55	55.1	55.65	56.2	**56.75**
6	**52**	51	49	49	50	**54**	54.55	55.1	55.65	56.2	**56.75**
7	**61**	fulfilled if RES share remains above 60%					fulfilled if RE share remains above 60%				

The values for 2025 and 2030 are the reference which establish whether the average increase over each time period has been achieved.

It is important to note that the 50% and 60% thresholds are not exemptions from the mandatory annual average increase, but flexibilities introduced for Member States that achieve a high renewable energy share in the heating and cooling sector which allows them to count such high shares as partial or full fulfilment of the mandatory increase.

In addition to the mandatory increase, the third subparagraph of Article 23(1) requires Member States to endeavour to increase their share of renewable energy in heating and cooling by additional indicative percentage point increases (or "top-ups") which are listed in the table of Annex Ia of the revised Directive.

3.4. Flexibilities for waste heat and cold and renewable electricity

Article 23(1) provides flexibilities for the purposes of fulfilling the obligation to increase the share of renewable energy in the heating and cooling sector set out in the first subparagraph. More particularly, Article 23(1), second subparagraph, allows Member States to count waste heat and cold towards the binding average annual increases to be achieved over the two periods, while Article 23(1), fourth paragraph allows Member States to count renewable electricity used in heat and cold generators

with an efficiency higher than 100%, i.e. heat pumps, for the purposes of such accounting. ([8])

The revised RED introduces two main novelties compared to REDII: the maximum amount of waste heat and cold that may be counted towards the annual average increase has been lowered and the option to count renewable electricity used for heating and cooling has been added. It should be noted that these flexibilities are not allowed when calculating the renewable share for the heating and cooling sector as meant in Article 7 and therefore cannot contribute to the overall EU renewables target in Article 3.

Both waste heat and cold and renewable electricity may be counted towards the annual average increase to a separate maximum of 0.4 percentage points for waste heat and cold and 0.4 percentage points for renewable electricity. In that case, the target should be increased by half of each amount of waste heat and cold and/or renewable electricity that was accounted for, to an upper limit of 1.0 percentage points for the years 2021-2025 and 1.3 percentage points for the years 2026-2030. It must be noted that these flexibilities do not apply to the additional indicative percentage point increases listed in Annex Ia. An example is provided in Box 3 below.

([8]) It should be noted that waste heat and renewable electricity used in heating and cooling do not constitute renewable energy used in heating and cooling for the purposes of Article 23 and Article 7 of RED and therefore cannot contribute to the overall EU renewables target in Article 3.

Box 3. Examples of adaptations to the targets when flexibilities are used.

As an example, a Member State with a RES-share in heating and cooling of 10% in 2020 will need to achieve an average annual increase of 0.8 percentage point and reach 14% by 2025 if they choose to only meet the target with renewable energy.

If this Member State chooses to meet part of the target by accounting waste heat and cold and renewable electricity, and account 0.2 percentage points of waste heat and cold and 0.1 percentage points of electricity (0.3 pp in total), their contribution towards the annual increase only increases by half that amount (0.15 pp) – i.e. the required average annual increase reaches 0.95 pp (and the Member State should therefore reach 14.75% by 2025), as illustrated in Figure 1.

As the upper limit for the period 2021-2025 is 1.0 percentage point, accounting higher amounts of waste heat and cold and renewable electricity will not result in increases of the required average annual increase, as illustrated in Figure 2 This is similar for the period 2026-2030 (upper limit of 1.3 pp).

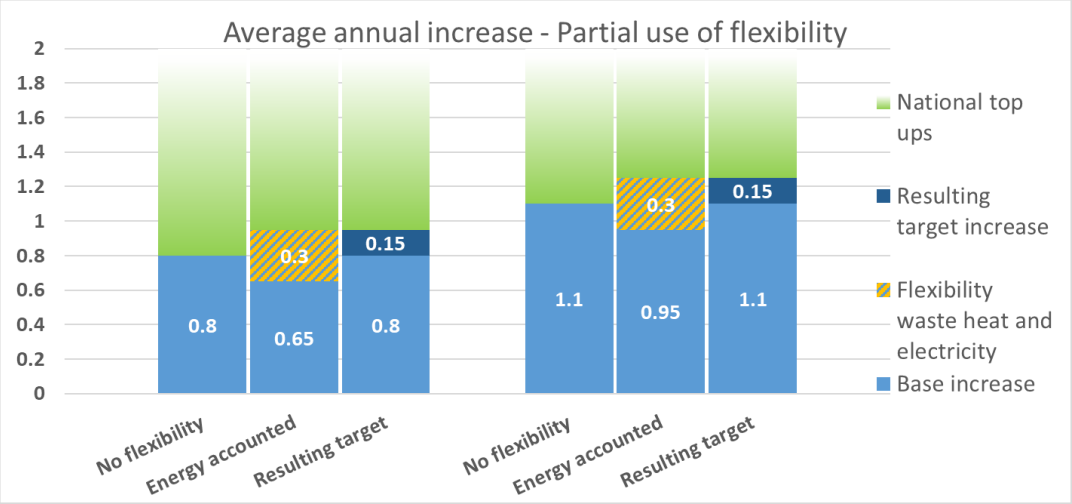

Figure 1. Example of the use of the flexibilities for waste heat and cold and/or renewable electricity for a total of 0.3 percentage point.

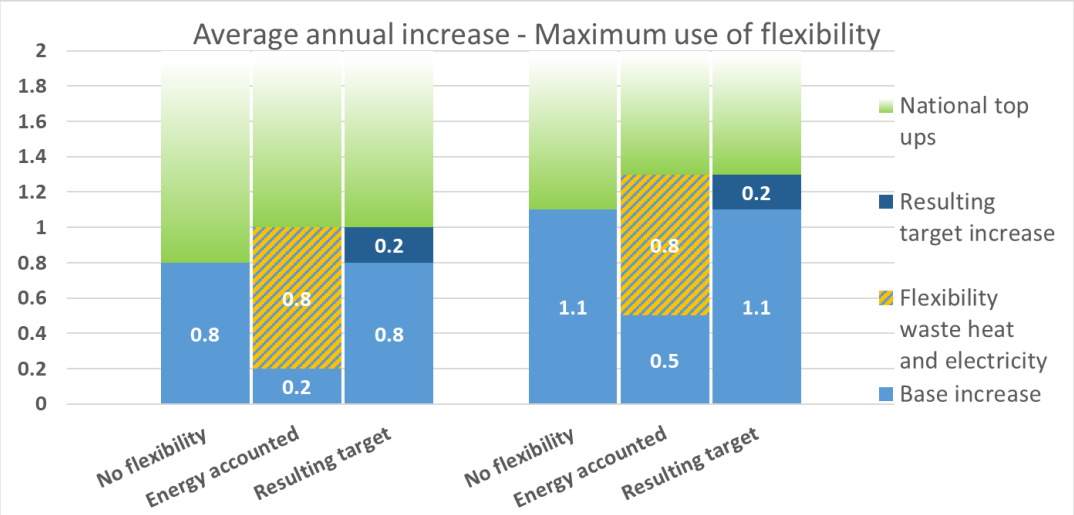

Figure 2. Example of the maximum use of the flexibilities for waste heat and cold (0.4 pp) and renewable electricity (0.4 pp)

If Member States decide to make use of the possibility to count renewable electricity used for heating and cooling towards the annual average increase of paragraph 1, the following considerations must be taken into account.

The overall renewable energy target is set in Article 3. Article 7 explains that the share of renewable energy should be calculated as the sum of renewable electricity, renewable energy in the heating and cooling sector and renewable energy in the transport sector. Article 7(3) states that the ambient and geothermal energy used for heating and cooling by means of heat pumps may be accounted as renewable energy in the heating and cooling sector. It refers to Annex VII which sets specific requirements on the heat pumps which are eligible counting that energy against the overall and heating and cooling targets (heat pumps above a certain efficiency level, calculated on the basis of a seasonal performance factor (SPF) > 1,15*1/η). Article 23(1), first subparagraph states that the share of renewable energy in heating and cooling should be calculated in accordance with Article 7. Hence, only the ambient or geothermal fraction used in such heat pumps may be counted *fully* towards the average annual increase.

Article 23(1), fourth subparagraph allows the *partial* counting of renewable electricity used in heat and cold generators with an efficiency above 100%, towards average annual increase. In practice, such heat and cold generators correspond to heat pumps. This flexibility for renewable electricity used in heat pumps can be seen as complementary to the accounting provision for ambient and geothermal heat used in heat pumps in Article 7(3). However, this flexibility is based on a slightly different scope than the overall requirement, with a less stringent requirement on which heat pumps are eligible (efficiency above 100% instead of SPF > 1,15*1/η in Annex VII).

Therefore, according to Article 23(1), there are two separate accounting methods for the energy flows associated with heating and cooling through heat pumps. Setting up separate reporting requirement for these two different types of eligible heat pumps in practice may lead to statistical inconsistency and additional administrative burden. There is even a third heat pump associated accounting method for renewable energy which applies to efficient district heating networks as meant in Article 26 of the revised EED. Caution should be taken that the different accounting methods are not mixed up. Member States are therefore encouraged to use the methodology defined under Annex VII (SPF > 1,15*1/η) to determine all energy flows associated with heating through heat pumps for the purpose of this Article 23.

It should be noted that electric boilers, which have an efficiency lower than 100%, meet none of the criteria described above regarding the heat generator. Therefore, the electricity used in electrical boilers may not be counted towards the annual average increase as they do not fulfil the requirements. The use of renewable electricity is incentivised in other ways throughout the Directive, in particular in Article 3 by contributing to the overall EU renewables target but also in Article 24 where it may be accounted towards the annual average increase as a flexibility. See Table 3 below for a short overview of the different accounting methods across multiple Articles in the revised RED and revised EED.

Table 3. Different types of energy flow associated with electric heating which may be accounted across Articles.

Heating technology	**Art. 3 / Art. 7**	**Art. 15a**	**Art. 22a**	**Art. 23**	**Art. 24**
Heat pumps in Accordance with Annex VII	Ambient and geothermal input	X	X	Ambient and geothermal input	X
Heat and cold generators with efficiency > 100%	RES-E input	RES-E input + Ambient and geothermal input	RES-E input + Ambient and geothermal input	RES-E input*	RES-E input + Ambient and geothermal input
E-boilers	RES-E input	RES-E input	RES-E input	X	RES-E input

* Applies only to flexibility, not the main target

4. ACCOUNTING THE SHARE OF RENEWABLE ENERGY IN ARTICLE 24

4.1. General overview of Article 24

Article 24 of the revised RED includes the following obligations and measures:

- Paragraph 1 contains an obligation to provide information to consumers on energy performance and renewable shares in district heating systems in an easily accessible manner.

- Paragraph 2 requires Member States to adopt measures to ensure the right of customers to disconnect from a non-efficient district heating and cooling system, while paragraph 7 further elaborates on the type of customers which may exercise these rights. Paragraph 3 allows Member States to limit the right to disconnection under certain conditions.

- Paragraph 4 sets an indicative renewable energy and waste heat and cold target to be achieved by Member States in the district heating and cooling sector by 2030, in terms of gross final energy consumption. It furthermore states how renewable electricity may be accounted towards this target.

- Paragraph 4a contains calculation rules for the share of renewable electricity used in district heating and cooling. It also allows Member States to fulfil (partially or fully, depending on the level of renewable energy and waste heat and cold) the indicative target referred to in paragraph 4.

- Paragraph 4b aims to encourage the connection of third-party suppliers of energy from renewable sources and waste heat and cold to district heating or cooling systems and paragraph 5 defines the situations where such connection may be refused.

- Paragraph 6 calls for a coordination framework to be put in place, where necessary, in order to ensure dialogue as regards the use of waste heat and cold between the relevant stakeholders.

- Paragraph 8 calls for a framework in which the potential for balancing and system services is assessed in district heating and cooling systems. It furthermore states that electricity transmission and distribution system operators (TSO and DSO) must take note of the outcomes in their grid planning, grid investments and infrastructure developments. It also states that DHC system operators must be able to participate in the electricity market with flexibility services and allows Member States to extend the assessment mentioned in this paragraph to gas TSOs and DSOs.

- Paragraph 9 safeguards the rights of consumers.

- Paragraph 10 lays down the conditions under which Member States do not have to apply paragraphs 2 to 9.

4.2. New elements of Article 24

The revised RED introduces the following important modifications:

- Member States are now required to both (i) endeavour to increase the share of renewable energy and waste heat and cold in the district heating and cooling sector and (ii) encourage that operators of district heating or cooling systems connect suppliers of energy from renewable sources and from waste heat and cold or offer to connect and purchase heat or cold from renewable sources and from waste heat and cold from third-party suppliers. Under REDII they could choose either option (i) or to oblige (instead of encourage) operators to what is described in point (ii).

- Member States are required to establish a framework for cooperation between electricity distribution system operators (DSOs) and operators of district heating and cooling systems to ensure that an assessment is made on how the latter can provide system services.

4.3. Indicative annual average increase

Article 24(4) requires Member States to endeavour to increase their share of renewable energy and from waste heat and cold in their district heating and cooling sector. This provision sets an indicative renewable energy and waste heat and cold target for the district heating and cooling sector. As explained in section 4.1, this indicative increase is not optional anymore for Member States, who have an obligation to carry out efforts to achieve such indicative share in their district heating and cooling sectors.

The architecture of this indicative target is similar to the heating and cooling target laid down in Article 23, explained in section 3.3, with the main differences that waste heat and renewable electricity are part of the target.

In the case of district heating and cooling, the revised RED has increased the indicative increase to 2.2 percentage points (1.0 percentage points under RED II) as an annual average calculated for the period 2021 to 2030 (instead of two periods in the case of Article 23), starting from the share of energy from renewable sources and from waste heat and cold in district heating and cooling in 2020. The values reported in EU statistics to Eurostat should be used for this reference year. Member States were however not required to submit values for waste heat consumption in different sub-

sectors in 2020 when the 2009 Renewable Energy Directive (RED I) ([9]) was in force, nor were they required to submit renewable shares in district heating and cooling. Hence, Eurostat statistics do not contain the required 2020 reference values for all Member States (some Member States have submitted these values without there being a requirement). Therefore, Member States should indicate their share of renewable energy in their district heating and cooling and their consumption of waste heat and cold within district heating in 2020. The SHARES tool, as mentioned in Box 1, will facilitate this reporting. If they do not submit their share of renewable energy in the district heating and cooling sector in 2020, then default values will have to be used as a proxy. These values are based on the renewable share in derived heat as historically reported to Eurostat. The resulting proxy default 2020 reference values are presented in Annex B. For some Member States the difference between the proxy default values and the actual share of renewable energy and waste heat in DHC as reported may be substantial. It is therefore important that all Member States submit their values. If Member States do not provide their 2020 consumption level of waste heat and cold, the value for the next available year could be taken as reference ([10]). The values should be identical to those reported in the assessment referred to in Article 23(1b), which should be part of the integrated national energy and climate plans submitted pursuant to Articles 3 and 14 of Regulation (EU) 2018/1999. . Consistency should be ensured throughout the target period: if a Member State does not have the full data at the beginning of the target period but is able to provide it at a later stage, the scope of the first set of reported data should be adapted in order to avoid purely statistical increases or decreases.

Similar to Article 23, Article 24 also provides flexibility for Member States who achieve significant levels of renewable energy and waste heat and cold in their district heating and cooling sector. Member States that achieve a share of renewable energy and from waste heat and cold in their district heating and cooling higher than 60% are considered to fulfil the indicative average annual increase. When such share is between 50% and 60%, Member States can count such share as fulfilling half of the average annual increase.

Article 24 however provides for exemptions to fulfil the indicative annual average increase. The revised RED has not modified the substantive elements of these exemptions but has introduced a few precisions. Member States are exempted if:

- Their share of district heating and cooling in total heating and cooling was equal to or lower than 2% in 2018 ([11]). The revised Directive clarifies that this should be calculated in terms of gross final energy consumption.

- That 2% threshold is surpassed by using efficient district heating and cooling.

([9]) Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, OJ L 140, 5.6.2009.

([10]) Some Member States have reported on this value in the SHARES tool from 2021 onward. This value, or the next one available, will then be taken as 2020 reference.

([11]) The Directive mentions “on 24 December 2018” but this should be read as in 2018 until 24 December. To reduce administrative burden 2018 as a whole may also be chosen.

- 90% of the gross final energy consumption in district heating and cooling systems take place in district heating and cooling systems that meet the definition laid down in Article 26 of the revised EED.

Compared to Article 23, waste heat and cold and renewable electricity are part of the target in Article 24 and therefore cannot be considered a flexibility. Where in Article 23 only renewable electricity from certain types of heat and cold generator may be accounted, Article 24(4) does not set any specific requirement for the type of eligible heat and cold generator and therefore the renewable electricity used in any type of heat pump or electric boiler may in principle contribute. However, as stated in section 3.4, the use of different reporting requirements and criteria may lead to statistical inconsistency and additional administrative burden. Member States are therefore encouraged to use the methodology defined under Annex VII to determine the eligible heat and cold generators for the purpose of this Article 24.

Member States must inform the Commission of their intention to count renewable electricity used in district heating and cooling towards the indicative annual increase laid down in Article 24(4). If Member States decide to use this possibility, they must use the average share of renewable electricity supplied in their territory in the two previous years using EU statistics.

5. ACCOUNTING THE SHARE OF RENEWABLE ENERGY IN ARTICLE 15A

5.1. General overview of Article 15a

The revised RED includes a new Article 15a which aims to ensure that minimum levels of renewables are integrated in buildings, the largest energy consuming sector in the Union (40% share in terms of final energy consumption in 2022) ([12]). Article 15a of the revised RED includes the following new obligations and measures:

- Paragraph 1 calls for Member States to determine a target in the buildings sector by 2030 for:
    - renewable energy produced on-site,
    - renewable energy produced nearby, and
    - renewable energy taken from the grid.
- The target should be defined in terms of final energy consumption and in line with the Union's share of 49%. Paragraph 1 also requires Member States report on how they plan to achieve this target in their national energy and climate plans.
- Paragraph 2 indicates that Member States may apply flexibilities for waste heat and cold.
- Paragraph 3 requires measures to be introduced in the building sector to increase the share of:

([12]) https://ec.europa.eu/eurostat/databrowser/bookmark/53d8320f-34d1-4780-a135-6b1d390d581c?lang=en

    - electricity from renewable sources produced on-site,
    - electricity from renewable sources produced nearby,
    - heating and cooling from renewable sources produced on-site,
    - heating and cooling from renewable sources produced nearby, and
    - renewable energy taken from the grid.

- Paragraph 3 also requires Member States to include in their national regulations and building codes and, where applicable, in their support schemes or by other means with equivalent effect, in new buildings and in existing buildings that are undergoing major renovation or a renewal of the heating system, the use of minimum levels of:
    - energy from renewable sources produced on-site,
    - energy from renewable sources produced nearby, and
    - renewable energy taken from the grid.

It is important to note that according to Article 2(1) "energy from renewable sources" and "renewable energy" are synonymous. Hence, the sets of renewable energy sources mentioned across paragraph 1 and 3 in principle refer to the same type of energy source.

5.2. Indicative national share

Article 15a introduces a specific indicative goal of at least 49% for renewable energy consumption in buildings to be achieved by 2030 in the Union. This indicative goal or benchmark aims to complement the relevant Union legislation applicable to the building sector ([13]) and to guide Member States' efforts to decarbonise the Union's buildings stock.

To achieve this indicative benchmark set at Union level, Member States have the obligation to determine indicative national shares of renewable energy produced on-site or nearby as well as renewable energy taken from the grid to be achieved in the final energy consumption in their building sector in 2030. Those national indicative shares need to be consistent and contribute to the achievement of the overall indicative goal of 49% renewable energy and included in the NECPs. More detailed information on which specific elements in the energy balances contribute to the indicative national share will be provided by the SHARES tool, as mentioned in Box 1.

In order to help Member States determine their indicative national share, the Commission considers that the relative increase at EU-level could be taken as a benchmark. The EU-level target of 49% corresponds to a 28.1 percentage point increase compared to the 2020 share of 20.9%. The table in Annex C indicates shares per Member State and for the Union in 2020 based on proxy data reported to Eurostat, which can serve as a starting point for the calculation. These values are calculated based on Regulation (EC) 1099/2008 on energy statistics and the share of renewable

([13]) notably EPBD, Ecodesign, Energy labelling

electricity reported in SHARES, using the average of 2018 and 2019. However, for heat, the national average of renewables in gross heat production in 2020 has been used. The third column of the table in Annex C indicates the corresponding level for each Member State when applying the same increase as the EU-wide increase in terms of percentage points (28.1 pp).

5.3. Scope of the target

In order to determine the share of renewable energy "on-site or nearby and taken from the grid", it is essential to ensure coherence with the Energy Performance of Buildings Directive (EPBD), which provides relevant definitions for "on-site" and "nearby" in Article 2(54) and Article 2(55) respectively. A relevant definition of renewable energy taken "from the grid" is not provided ([14]).

For the purposes of Article 15a of the revised RED, Member States can count all the renewable energy produced on-site and nearby in line with the definitions of the EPBD, in addition to all the renewable energy (for electricity, heating and cooling and gas) taken from the grid. The electricity fraction includes all energy used for appliances, recharging points, etc. For the purposes of the EPBD, only energy used for energy performance uses may be accounted (e.g., heating, cooling, air-conditioning, etc.). If specific values for heating and cooling, electricity and gas are not available, the Commission will use the renewable shares in electricity, renewable shares in district heating and cooling and renewable shares in the gas grid to determine default values for the renewable energy taken from the grid per Member State.

To calculate these shares, a similar approach to the one used in Articles 23 and 24 should be used (average share of renewable energy in electricity or gas mix or district heating supply in the two previous years).

More accurate estimates may be provided by Member States, for example to distinguish self-consumption in buildings from the overall share of renewable electricity in the grid. The corresponding data should be provided to Eurostat and will be integrated in the SHARES tool.

5.4. Flexibility for waste heat and cold

Similar to Article 23, paragraph 2 of Article 15a allows Member States to count waste heat and cold towards their indicative national share, up to a limit of 20% of such a share. If this is the case, the target shall be increased by half of the percentage used.

It is important to note that the limit of 20% is set as a percentage and not a percentage point as in Article 23. As an example, if a Member State were to set an indicative target of 50%, they would be allowed to count 10 percentage points (20% of 50%) of waste heat and cold towards that target. The indicative target would then however

([14]) The EPBD does not define specific boundaries, but only provides some indications in the context of zero-emission buildings whereby total annual primary energy use to be covered by other energy from the grid in line with specific criteria set at national level (in Article 11(7)). In addition, the EPBD also defines the "renewable primary energy factor' as an indicator that is calculated by dividing the primary energy from renewable sources from an on-site, nearby or distant energy source that is delivered via a given energy carrier, including the delivered energy and the calculated energy overheads of delivery to the points of use, by the delivered energy.

increase by 5 percentage points (half of the percentage of waste heat and cold counted towards that target), resulting in an indicative national share of 55%.

6. ACCOUNTING THE SHARE OF RENEWABLE ENERGY IN ARTICLE 22A

6.1. General overview of Article 22a

Article 22a aims to promote the deployment of renewable energy sources in the industry sector. In order to do so, Article 22a introduces an indicative target for the industry sector and a mandatory RFNBO target.

This document aims to provide guidance on the heating and cooling aspects of Article 22a, namely the first three sub-paragraphs of Article 22a(1). A separate guidance document ([15]) clarifies the remaining aspects of Article 22a.

Article 22a(1) sets an indicative renewable energy target to be achieved in the industry sector over two periods in terms of final energy and non-energy consumption. It furthermore states how waste heat and cold may be accounted towards the target, provided that the waste heat and cold is supplied from efficient district heating ([16]) and cooling. It also obliges Member States to include the policies and measures planned and taken to achieve the increase in their NECP and NECPRs.

6.2. Indicative national share

The new Article 22a of the revised RED does not mention a reference year, but similarly to the approach followed in Articles 23 and 24, the year 2020 should be taken as reference year for the increase. Member States were not obliged to report their share of renewable energy in industry in 2020. The table in Annex D gives reference values for 2020 per Member State provided by Eurostat using the final renewable energy consumption values as well as renewable electricity and steam consumption values, which are based on the renewable shares in electricity and in the production of heat that is sold, respectively. Member States are encouraged to report on their 2020 reference value . Just as for the targets in district heating and cooling and buildings, an update of the SHARES tool will enable them to report on data for the industry sector. If Member States choose not to report on their reference value, the values presented in Annex D will be used. The same methodology as for Article 15a has been used.

6.3. Flexibility for waste heat and cold

The flexibility for waste heat and cold is similar to the one in Article 23, with the exception that only waste and cold supplied from efficient district heating and cooling may be accounted and that there is no upper limit when calculating by how much the target must be increased as a result of accounting waste heat: the target should be increased by half the percentage points of waste heat and cold counted.

The Article states that waste heat from networks “where all thermal energy is consumed only on-site and where the thermal energy is not sold” should be excluded. This provision targets industrial sites where a single enterprise has multiple buildings

([15]) C(2024)5042

([16]) As defined in the Energy Efficiency Directive (EU) 2023/1791

connected to the same district heating network and consumes its own waste heat. This is explained by the last sentence of recital 70 with the wording "*Specifically including waste heat in the industrial renewable energy benchmark should be acceptable only as regards waste heat or cold delivered via a district heating and cooling operator from another industrial site or another building, thus ensuring that such operators have heat or cold supply as their main activity and that the waste heat counted is clearly differentiated from internal waste heat recovered within the same or related enterprise or buildings.*". This exclusion is specific to the target in Article 22a.

The Article states that waste heat from "networks which supply heat to only one building" should be excluded. These networks however are already excluded by default as the definition of "district heating" in RED Article 2(19) requires the distribution of thermal energy "through a network to multiple buildings or sites".

Annex A

Examples of what qualifies as waste heat or cold and what does not using colour coding.

Technology		**By-product**		**Unavoidable**		**Use**
Thermal power generation, cogeneration, waste incineration	+	Heat leaving the condenser for closed-cycle plants and exhaust gases for open-cycle plants. Heat demonstrated not to be primary aim of process.	+	All reasonable EE measures implemented, e.g., the best available technology or convert a power plant to CHP	+	Delivery to a district heating and cooling system
		Primary aim, e.g. cogenerated heat.		Cost-efficient energy efficiency measures or cogeneration were feasible but not implemented		Used off-site but not in a district heating and cooling system
Industry						
Energy-intensive industries (e.g. cement, steel, aluminium) Other industries		By-products from the process or space heating or cooling		All reasonable internal reuses of heating and cooling used. Pinch analysis to identify the unavoidable waste heat and cold is recommended for energy-intensive industries. An independent energy auditor could be used for less energy-intensive or smaller companies, which are anyway less likely to sell heat to district heating and cooling.		Delivery to a district heating and cooling system
		Intended production – primary aim		Excess heating and cooling reused inside the industry/plant are accounted as energy efficiency improvement, not waste heat and cold.		-
Tertiary						
Data centres, supermarkets, metro		By-products include excess heat from computers of data centres, chillers, lighting		All cost-efficient EE measures were implemented, e.g. reuse of heat on-site, upgrade CPUs, upgrade lighting.		Delivery to a district heating and cooling system
		Intended production – primary aim		Avoidable WHC		Used off-site but not in a DHC
Sewage systems, wastewater, mine		By-products from *economic activities* in the production process, e.g. wastewater treatment plant or mining machinery generating heat during operation		All cost-efficient energy efficiency measures implemented. Identified using a pinch analysis or independent energy audit.		Delivery to a district heating and cooling system
		Heat from *non-economic activities* such as sewage networks or abandoned mines are		Avoidable waste heat and cold, such as identified energy efficiency		Used off-site but not in a district heating and

		considered renewable but not waste heat (ambient energy).		improvements that were not implemented.		cooling system
Residential		-		-		-
Transport		-		-		-

Annex B

Default proxy values for district heating and cooling to be used if Member States do not submit historical values – these are based on renewable energy shares only.

Member State	**2020 default value based on derived heat, excluding waste heat**
Belgium	9%
Bulgaria	16%
Czech Republic	10%
Denmark	65%
Germany	19%
Estonia	70%
Ireland	0%
Greece	0%
Spain	0%
France	42%
Croatia	28%
Italy	18%
Cyprus	100%
Latvia	55%
Lithuania	59%
Luxembourg	74%
Hungary	15%
Malta	0%
Netherlands	20%
Austria	52%
Poland	7%
Portugal	0%
Romania	6%
Slovenia	20%
Slovakia	21%
Finland	47%
Sweden	71%

Annex C

Shares of energy from renewable sources in the buildings sector to be used if Member States do not submit 2020 values ([17]), and share in 2030 based on applying the same increase to these shares as for the EU (from 20.9% in 2020 to 49% in 2030, i.e. a 28.1 percentage point increase).

Member State	**2020 (EUROSTAT)**	**2030 share with a flat rate increase (28.1 pp)**
Belgium	8,9%	37,0%
Bulgaria	28,2%	56,3%
Czechia	20,1%	48,2%
Denmark	36,3%	64,4%
Germany	17,7%	45,8%
Estonia	35,2%	63,3%
Ireland	11,3%	39,4%
Greece	23,8%	51,9%
Spain	20,5%	48,6%
France	18,3%	46,4%
Croatia	38,1%	66,2%
Italy	21,9%	50,0%
Cyprus	20,0%	48,1%
Latvia	38,3%	66,4%
Lithuania	30,9%	59,0%
Luxembourg	9,9%	38,0%
Hungary	15,4%	43,5%
Malta	9,1%	37,2%
Netherlands	8,8%	36,9%
Austria	37,7%	65,8%
Poland	16,9%	45,0%
Portugal	38,2%	66,3%
Romania	31,8%	59,9%
Slovenia	31,1%	59,2%
Slovakia	18,5%	46,6%
Finland	30,1%	58,2%
Sweden	36,9%	65,0%
EU27	**20,9%**	**49,0%**

([17]) These shares do not include self-consumption of renewables, which might lead to statistical differences.

Annex D

Shares of energy from renewable sources in industry to be used if Member States do not submit 2020 values ([18]).

Member State	**2020 (EUROSTAT)**
Belgium	6.4%
Bulgaria	11.7%
Czech Republic	7.8%
Denmark	22.5%
Germany	10.9%
Estonia	11.3%
Ireland	13.3%
Greece	10.4%
Spain	13.5%
France	8.7%
Croatia	10.0%
Italy	10.2%
Cyprus	14.3%
Latvia	46.4%
Lithuania	10.6%
Luxembourg	4.4%
Hungary	5.2%
Malta	2.7%
Netherlands	3.1%
Austria	25.0%
Poland	10.2%
Portugal	24.6%
Romania	9.9%
Slovenia	12.8%

([18]) These shares do not include self-consumption of renewables, which might lead to statistical differences.

Slovakia	9.7%
Finland	35.3%
Sweden	45.5%
EU27	**13.0%**

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For the Secretary-General

Martine DEPREZ
Director
Decision-making & Collegiality
EUROPEAN COMMISSION