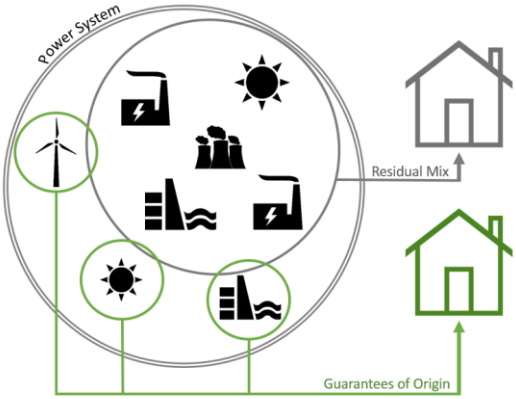
European Residual Mixes

Results of the calculation of Residual Mixes for the calendar year 2020

Version 1.0, 2021-05-31

Introduction

The purpose of a Guarantee of Origin (GO) system is to enable consumers to have their say on how electricity is generated by selecting a supplier and a power product. For consumers to be able to make informed choices, electricity suppliers must disclose the origin and environmental attributes of sold electricity (IEM Directive (EU) 2019/944, Annex 1 (5)). This is called electricity disclosure.



For power companies to be able to tell their customers anything about the origin of the electricity in todays unbundled, international and complex power market, they need a way to track electricity from production to consumption. The main tracking tool for electricity is the GO (REDII Directive 2018/2001, Art 19). As long as not all consumption is tracked using GOs, a *residual mix* is needed to make the GO a reliable tracking instrument. A country's residual mix represents the shares of electricity generation attributes available for disclosure, after the use of explicit tracking systems, such as GO, have been accounted for. Without a residual mix, renewable electricity sold with GOs would be double counted because the same electricity would be disclosed to consumers buying "regular" electricity.

***Note**: For the calculation methodology and results since 2015, please refer to the AIB-website. For additional background information regarding the concept of residual mix calculations and its application please refer to the website of the RE-DISS project http://www.reliable-disclosure.org, where you can find the final report of the project, residual mix calculation methodology, results of previous year calculations (up to year 2014) and the RE-DISS Best Practice Recommendations.*

Due to the international nature of both the electricity markets and tracking systems, the volume of available generation attributes in the domestic residual mix differs from the volume of untracked consumption[1]. Thus, the calculation of residual mixes needs to be centrally coordinated and a common pool for balancing generation attributes must be used. This is achieved via the European Attribute Mix (EAM), which replaces the deficit of energy origin caused by exported GOs. EAM acts as an "equalising reservoir" for generation attributes for national residual mixes. After the attribute balancing via the EAM the volume of available generation attributes in the residual mix is equal to the untracked consumption in every country. *This is a precondition for the GO to be a credible tracking instrument in the context of international trading.*

Residual mix is needed when consumption is only partially explicitly tracked. In so-called "full disclosure domains" residual mix is not needed because all consumption is covered by cancelled GOs. Austria has had a full disclosure system in place since 2017 and hence the residual mix zero. Also, Switzerland and Netherlands have full disclosure regulation but, due to detailed implementation and calculation rules, a residual mix can still be calculated and is included in the results. While Luxembourg doesn't have full disclosure regulation, the tracked cancellations surpassed the annual consumption, therefore the residual mix is zero for Luxembourg.

1 Untracked consumption = Electricity consumption for which the energy source is not explicitly disclosed through tracking instruments such as Guarantees of Origin.

The Residual mix is currently calculated using so-called issuance-based method. For more information refer to methodology material on: https://www.aib-net.org/facts/european-residual-mix.

Regarding the data sources, as for previous year, the usual production and exchange data sources on ENTSO-E were not available. Instead, Eurostat were used as the main production data source and the exchange data were collected from ENTSO-E Transparency platform (instead of the Power Statistics used before).

Description of the Document

The main results of this document are the **European Attribute Mix** (EAM) and the residual mixes for all countries. A wide variety of additional information is also presented as supporting material. The **EAM (**Table 1**)** is the mix of energy sources and the corresponding environmental indicators that is collected from countries which have surpluses of energy attributes. The EAM is then used to fill up the national residual mixes in case of a deficit of disclosure attributes. The national surpluses and deficits to/from EAM are shown in Table 3 and Figure 3.

The **national residual mixes** for 32 European countries[2] are shown in the Table 2, Figure 1 and Figure 2. Note that the official residual mixes for each country are in principle published by the respective national authorities. Also note that for countries without recorded explicit tracking, untracked consumption equals the total electricity consumption, and thus the residual mix is applicable for the disclosure of the entire electricity consumption.[3]

Energy sources in the residual mixes are divided in three main categories: renewable, nuclear and fossil, of which renewable and fossil are further divided into subcategories (Table 8). Selected subcategories are based on relevance in terms of volume and perceived consumer importance. The used categorization is also identical to all residual mix calculations since the 2013.

Figure 4 shows the **direct greenhouse gas emissions** as direct CO_2 emissions per kWh of produced electricity. Figure 5 shows the content of **highly active radioactive waste** as mgRW/kWh. Both of these environmental indicators are shown for the European Attribute Mix (EAM), the production mix (PM), the residual mix (RM) and the total supplier mix (TSM) of European countries.

The base data for the direct CO_2-emissions is based on the following references: Treyer and Bauer (2013), Dong Energy A/S, Energi.dk, Vattenfall (2010), Fritsche and Rausch (2009), Bauer (2008) and GEMIS database (GEMIS, 2015). The data for the radioactive waste has been compiled based on BDEW (2014), DECC (2014), the Platts World Database and IAEA PRIS. These indicators reflect the differences in waste rates produced by the types of nuclear power reactors used in the respective countries per kWh of electricity. Due to a lack of detailed data per reactor, the waste rates have been based on estimates of typical data for five major types of reactors used in Europe. However, where available, factors as reported by national authorities are used instead.

The total supplier mixes (TSMs) are presented in Table 4, and Figure 6. The total supplier mix represents the total consumption mix of a country, i.e. shares of energy sources in the tracked and untracked part of consumption. Thus, both explicitly tracked and available remaining electricity attributes are included in the TSM, which equals in physical volume with the country's total electricity consumption. The production mixes are shown in Table 5.

The evolution of attributes, on the European scale: how much renewables are in the Production mix, how much of those are left in the residual mix and finally how much renewables are carried on to EAM is shown in the Table 6 and Figure 8.

The rest of the results are different kinds of **comparisons** between different mixes and different years. Figure 7 present the comparison between the production and residual mix of different countries, and Figure 9 that of production and total supplier mix. Table 7 and Figure 10 show the difference between final residual mixes of 2018, 2019 and 2020.

***Note**: Any use of the data presented in this document should include a reference to AIB.*

***Note**: The calculated country and energy source/technology emission factors forming the base for the National Residual Mix calculations may not be sold, distributed or processed as part of a derivative tool.*

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2 Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iceland, Ireland (All-Island), Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland

3 Calculation of the Residual Mix obviously can only take the volumes of explicit tracking systems into account if the respective data is public or known by the authority and respectively being made available to the one who conducts the calculation. This means that explicit tracking systems, for which no statistical data is available to the competent authority and/or AIB, cannot be reflected in the residual mix and are therefore likely to lead to double counting.

Disclaimer on data quality:

Because of the 12 months lifetime of GOs, the residual mixes were calculated based on all recorded GO transactions during the assumed time period (1.4.2020 – 31.3.2021) for disclosure of 2020 consumption, irrespective of the underlying production year of these GOs. This ensures that over the years all GO transactions are considered in the calculation.

Volumes which have been explicitly tracked without the use of transparent tracking instruments, e.g. by so-called contract based tracking, self-declarations etc., cannot be taken into account at all.

Partners

References

Generation data: Eurostat: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_cb_pem&lang=en and https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_cb_em&lang=en

EECS Guarantee of Origin Statistics: Association of Issuing Bodies

Sources for emission factors:

BDEW (2014). Leitfaden “Stromkennzeichnung”, Berlin, Oktober 2014

Bauer, C. 2008. Life Cycle Assessment of Fossil and Biomass Power Generation Chains An analysis carried out for ALSTOM Power Services. Paul Sherrer Institut (PSI). PSI Bericht Nr. 08-05, ISSN 1019-0643 http://ventderaison.eu/documents/PSI-Bericht_2008-05.pdf .

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Fritsche, U and Rausch, L (2009). Life Cycle Analysis of GHG and Air Pollutant Emissions from Renewable and Conventional Electricity, Heating, and Transport Fuel Options in the EU until 2030. ETC/ACC Technical Paper 2009/18 June 2009. http://acm.eionet.europa.eu/reports/docs/ETCACC_TP_2009_18_LCA_GHG_AE_2013-2030.pdf

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RE-DISS II: http://reliable-disclosure.org/upload/250-D5.3_Direct_and_weighted_emissions.pdf

National Issuing Bodies and Disclosure Competent Bodies: Updates through the annual data collection

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Table 1: European Attribute Mix (EAM) 2020: Energy source distribution and environmental indicators

	RE Total	RE unspecified	RE biomass	RE solar	RE geothermal	RE wind	RE hydro	Nuclear	FO Total	FO unspecified	FO hard coal	FO lignite	FO oil	FO gas	CO2 (gCO2/kWh)	Rad waste (mg/kWh)
EAM	7.59 %	0.00 %	1.00 %	2.72 %	0.00 %	3.57 %	0.30 %	31.38 %	61.02 %	3.63 %	20.66 %	1.48 %	1.06 %	34.20 %	401.85	1.15

***EAM** = European Attribute Mix is used for balancing surpluses and deficits in national residual mixes caused by international trading of electricity and guarantees of origin.*

Table 2: Residual Mixes 2020

	RE Total	RE unspecified	RE biomass	RE solar	RE geothermal	RE wind	RE hydro	Nuclear	FO Total	FO unspecified	FO hard coal	FO lignite	FO oil	FO gas	Untracked %	CO2 (gCO2/kWh)	Rad waste ()mg/kWh
AT	**0.00 %**	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	**0.00 %**	**0.00 %**	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	**0.00 %**	0.00	0.00
BE	**12.53 %**	0.00 %	3.69 %	7.35 %	0.00 %	1.49 %	0.00 %	**44.47 %**	**43.01 %**	1.72 %	2.85 %	0.00 %	0.02 %	38.42 %	**65.08 %**	204.78	1.20
BG	**19.30 %**	0.00 %	3.52 %	4.03 %	0.00 %	4.03 %	7.73 %	**43.00 %**	**37.70 %**	0.00 %	31.57 %	0.00 %	0.58 %	5.55 %	**99.84 %**	372.12	1.50
CH	**22.28 %**	0.00 %	1.97 %	4.16 %	0.00 %	0.08 %	16.08 %	**70.65 %**	**7.06 %**	3.58 %	0.00 %	0.00 %	0.08 %	3.40 %	**5.83 %**	30.34	3.39
CY	**13.04 %**	0.00 %	0.91 %	6.90 %	0.00 %	5.24 %	0.00 %	**0.00 %**	**86.96 %**	0.00 %	0.00 %	0.00 %	86.96 %	0.00 %	**100.00 %**	642.00	0.00
CZ	**6.75 %**	0.00 %	3.40 %	2.27 %	0.00 %	0.43 %	0.65 %	**40.75 %**	**52.50 %**	0.12 %	2.66 %	40.00 %	0.11 %	9.61 %	**96.79 %**	532.44	1.43
DE	**0.93 %**	0.00 %	0.00 %	0.89 %	0.00 %	0.04 %	0.00 %	**21.23 %**	**77.84 %**	5.53 %	42.82 %	0.00 %	1.36 %	28.14 %	**31.29 %**	588.83	0.57
DK	**15.18 %**	0.00 %	0.69 %	4.25 %	0.00 %	9.39 %	0.86 %	**21.46 %**	**63.36 %**	5.18 %	28.04 %	1.01 %	1.55 %	27.57 %	**75.93 %**	427.67	0.79
EE	**6.60 %**	0.00 %	0.77 %	2.20 %	0.00 %	3.32 %	0.31 %	**23.93 %**	**69.47 %**	25.70 %	15.75 %	1.13 %	0.81 %	26.08 %	**89.91 %**	546.89	0.88
ES	**7.51 %**	0.00 %	0.93 %	2.35 %	0.00 %	3.63 %	0.59 %	**38.37 %**	**54.13 %**	1.51 %	4.54 %	0.09 %	6.70 %	41.28 %	**62.02 %**	286.53	1.05
FI	**5.59 %**	0.00 %	1.36 %	1.42 %	0.00 %	1.76 %	1.04 %	**52.42 %**	**41.99 %**	2.49 %	17.18 %	0.49 %	0.75 %	21.09 %	**67.43 %**	268.18	1.65
FR	**9.86 %**	0.00 %	0.00 %	2.61 %	0.03 %	6.21 %	1.00 %	**78.39 %**	**11.75 %**	0.00 %	0.86 %	0.00 %	0.97 %	9.92 %	**87.15 %**	58.52	2.12
GB	**8.93 %**	0.00 %	1.68 %	2.91 %	0.00 %	4.35 %	0.00 %	**25.35 %**	**65.73 %**	3.74 %	1.64 %	0.00 %	0.42 %	59.93 %	**42.79 %**	316.00	2.03
GR	**25.86 %**	0.00 %	1.09 %	9.00 %	0.10 %	12.47 %	3.19 %	**4.63 %**	**69.51 %**	0.80 %	6.69 %	11.38 %	7.65 %	42.99 %	**93.14 %**	490.40	0.17
HR	**6.24 %**	0.00 %	1.21 %	2.02 %	0.10 %	2.70 %	0.21 %	**22.23 %**	**71.53 %**	2.57 %	21.71 %	1.05 %	0.86 %	45.34 %	**84.99 %**	468.80	0.81
HU	**13.42 %**	0.00 %	4.48 %	6.12 %	0.02 %	1.98 %	0.81 %	**44.54 %**	**42.04 %**	1.28 %	12.72 %	0.24 %	0.28 %	27.51 %	**91.67 %**	274.11	1.57
IE	**29.46 %**	0.00 %	3.37 %	0.01 %	0.00 %	26.08 %	0.00 %	**0.00 %**	**70.54 %**	3.13 %	9.94 %	6.90 %	0.13 %	50.44 %	**0.75 %**	446.47	0.00
IS	**7.59 %**	0.00 %	1.00 %	2.72 %	0.00 %	3.56 %	0.30 %	**31.38 %**	**61.03 %**	3.63 %	20.65 %	1.48 %	1.08 %	34.19 %	**77.86 %**	401.93	1.15

	RE Total	RE unspecified	RE biomass	RE solar	RE geothermal	RE wind	RE hydro	Nuclear	FO Total	FO unspecified	FO hard coal	FO lignite	FO oil	FO gas	Untracked %	CO2 (gCO2/kWh)	Rad waste ()mg/kWh
IT	**10.23 %**	0.00 %	1.73 %	5.02 %	0.00 %	1.75 %	1.72 %	**11.42 %**	**78.35 %**	2.11 %	17.40 %	0.54 %	3.87 %	54.43 %	**93.49 %**	458.57	0.42
LT	**34.78 %**	0.00 %	6.53 %	1.04 %	0.01 %	19.13 %	8.07 %	**4.50 %**	**60.72 %**	1.02 %	3.83 %	0.00 %	1.30 %	54.58 %	**38.82 %**	340.19	0.17
LU	**0.00 %**	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	**0.00 %**	**0.00 %**	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	**0.00 %**	0.00	0.00
LV	**15.37 %**	0.00 %	3.26 %	1.35 %	0.00 %	2.39 %	8.37 %	**17.69 %**	**66.94 %**	1.83 %	12.04 %	0.74 %	0.65 %	51.69 %	**93.14 %**	421.52	0.65
MT	**11.45 %**	0.28 %	0.03 %	11.04 %	0.00 %	0.10 %	0.01 %	**0.85 %**	**87.70 %**	0.10 %	0.56 %	0.04 %	2.55 %	84.45 %	**85.86 %**	390.92	0.03
NL	**13.98 %**	0.00 %	0.00 %	13.01 %	0.00 %	0.24 %	0.73 %	**1.46 %**	**84.57 %**	0.00 %	10.83 %	0.00 %	2.83 %	70.90 %	**8.16 %**	451.72	0.04
NO	**7.38 %**	0.00 %	0.98 %	2.64 %	0.00 %	3.46 %	0.29 %	**30.96 %**	**61.66 %**	4.22 %	20.06 %	1.44 %	1.03 %	34.91 %	**79.07 %**	401.94	1.13
PL	**8.01 %**	0.00 %	2.60 %	1.50 %	0.00 %	2.92 %	0.98 %	**4.01 %**	**87.98 %**	2.52 %	70.51 %	0.16 %	0.12 %	14.67 %	**94.35 %**	798.68	0.15
PT	**20.98 %**	0.00 %	6.81 %	3.19 %	0.42 %	5.59 %	4.97 %	**12.52 %**	**66.50 %**	1.95 %	12.83 %	0.59 %	2.87 %	48.26 %	**94.55 %**	375.38	0.46
RO	**45.46 %**	0.00 %	0.57 %	3.25 %	0.00 %	12.94 %	28.70 %	**22.52 %**	**32.02 %**	0.00 %	16.47 %	0.00 %	0.13 %	15.43 %	**99.32 %**	265.16	3.66
RS	**25.63 %**	0.00 %	0.00 %	0.02 %	0.00 %	0.43 %	25.18 %	**0.00 %**	**74.37 %**	0.00 %	1.72 %	71.11 %	0.15 %	1.39 %	**93.08 %**	810.76	0.00
SE	**12.54 %**	0.00 %	3.99 %	0.00 %	0.00 %	8.55 %	0.00 %	**82.93 %**	**4.53 %**	4.10 %	0.01 %	0.15 %	0.27 %	0.00 %	**15.09 %**	23.14	2.24
SI	**0.87 %**	0.00 %	0.12 %	0.31 %	0.00 %	0.41 %	0.03 %	**55.78 %**	**43.35 %**	0.49 %	35.78 %	0.17 %	0.14 %	6.77 %	**86.96 %**	345.20	1.54
SK	**6.03 %**	0.00 %	2.05 %	3.02 %	0.00 %	0.50 %	0.46 %	**61.92 %**	**32.06 %**	2.44 %	4.87 %	4.25 %	1.61 %	18.89 %	**81.51 %**	218.23	2.17

Untracked Consumption *= Electricity consumption not explicitly disclosed through tracking instruments such as Guarantees of Origin.*
Note*: CO_2 and radioactive waste figures reported are destined for purposes of electricity disclosure only (rf. page 2).*
Data Sources*: Information reported by national Competent Bodies; Association of Issuing Bodies (AIB); Eurostat*

Graphs with detailed calculations results

Figure 1: Residual Mixes 2020

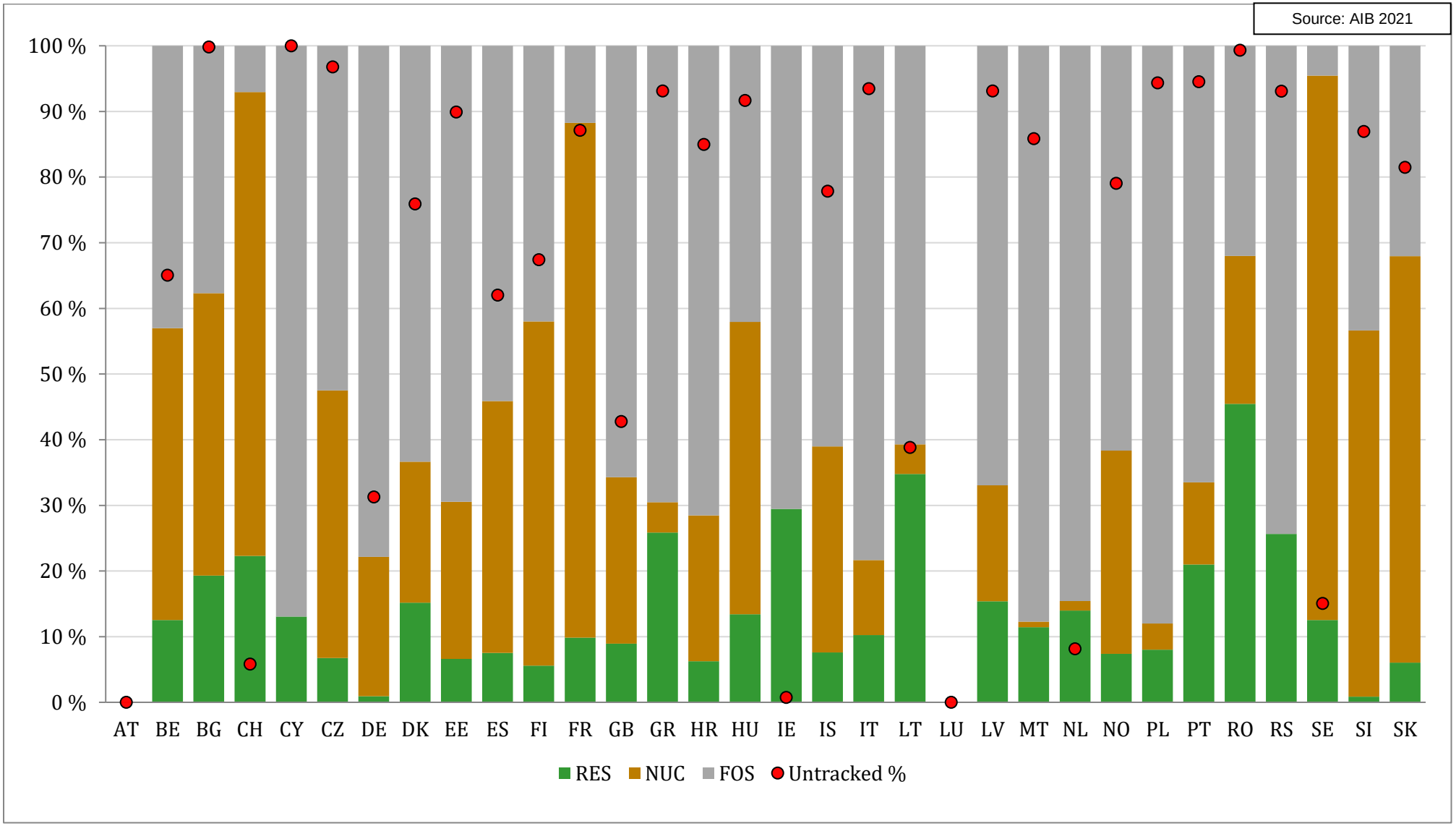


Figure 2: Residual Mixes 2020 (detailed fuel categories)

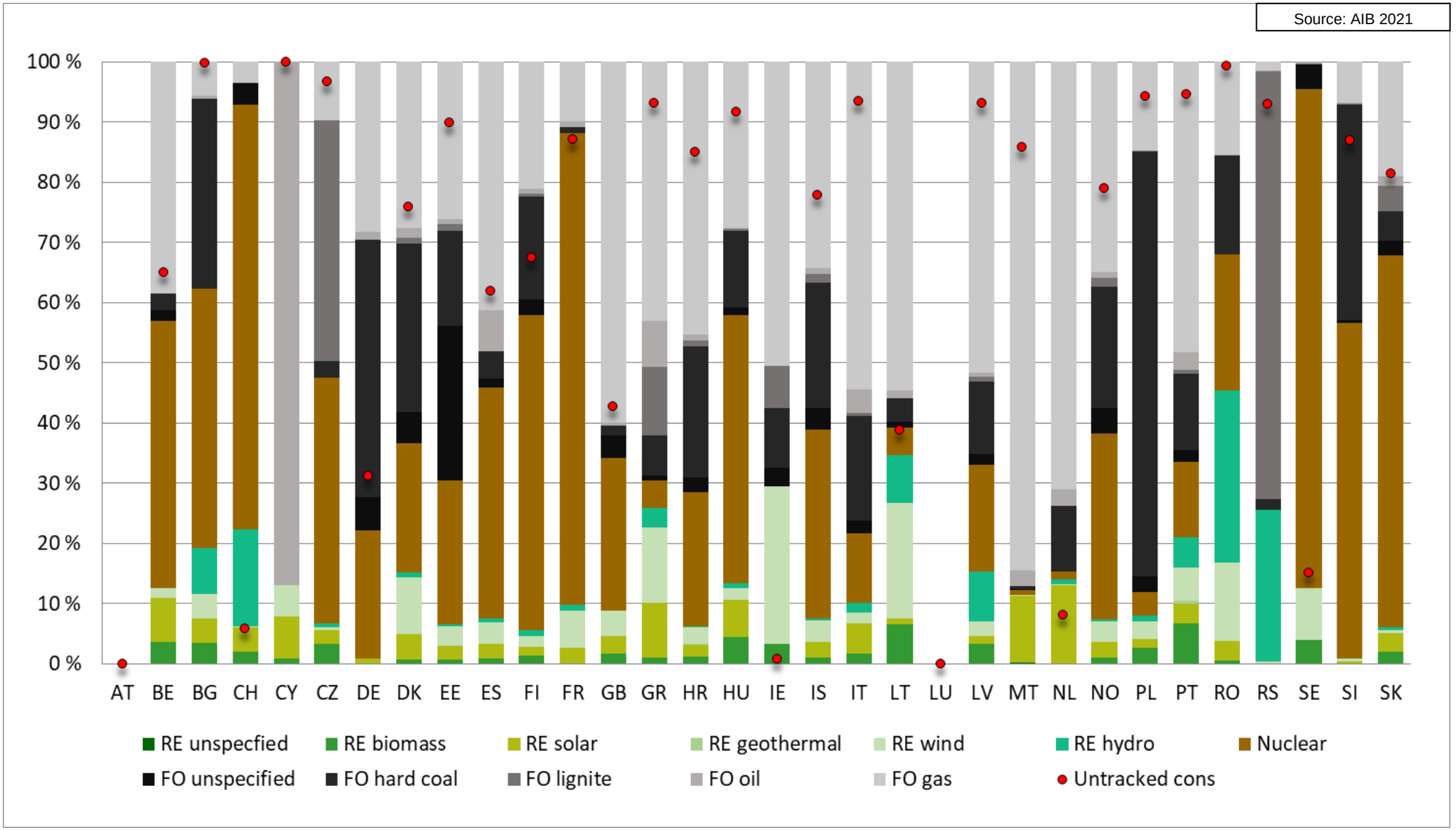
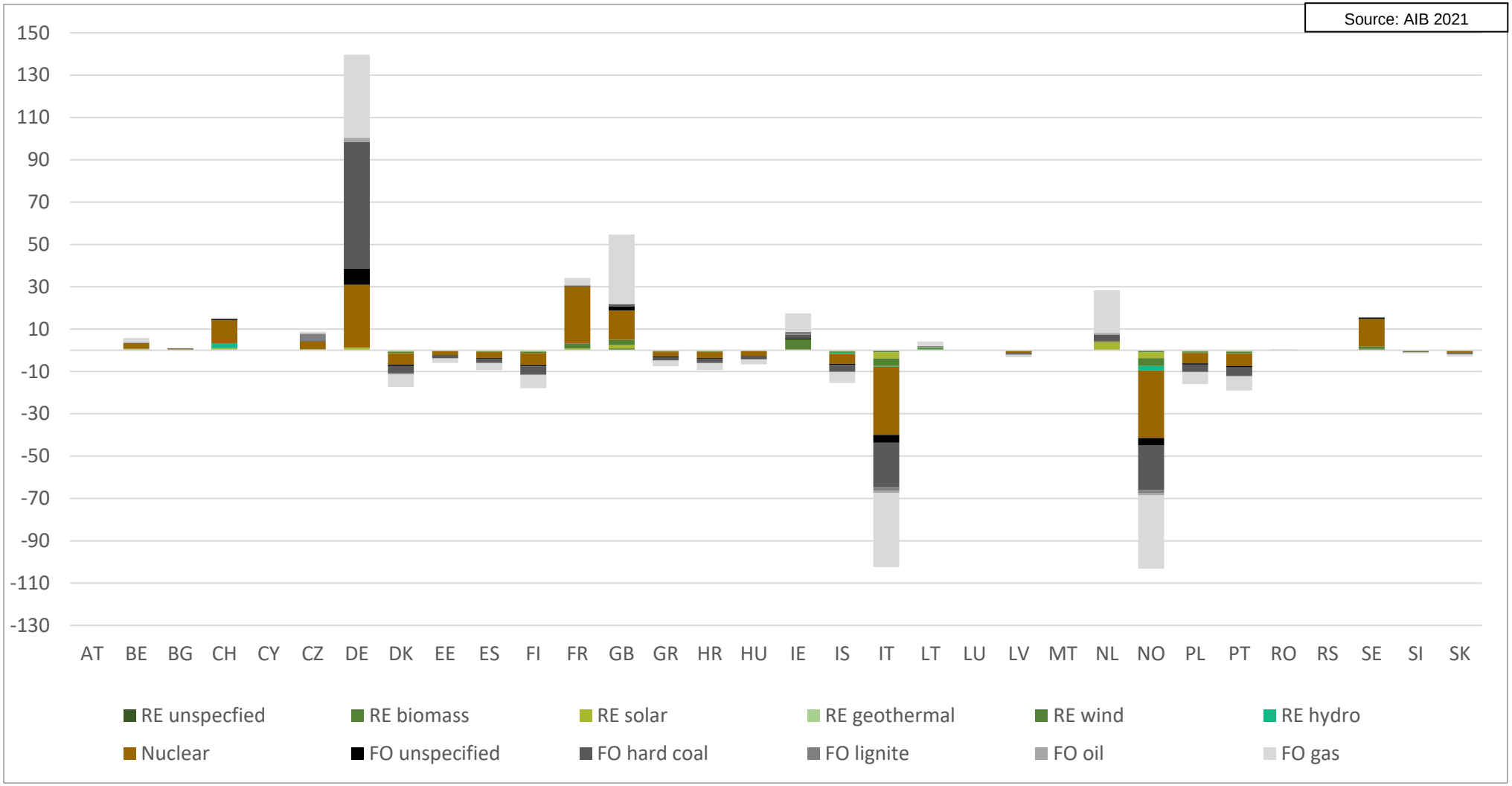


Figure 3: Attributes [TWh] to(positive)/from(negative) the European Attribute Mix 2020[4]



[4] In this figure, the renewable energy added to the EAM does not equal the renewable energy taken out of it, which may seem peculiar. There are two reasons for it: 1) temporal attribute deficit caused by issuing volumes being higher than cancellation volumes, and 2) some countries have negative renewable energy balance in domestic residual mixes (caused by variation in disclosure periods and GO lifetimes overlapping two disclosure periods). This negativity is transferred into the EAM before considering the domestic residual mix attribute surpluses and deficits.

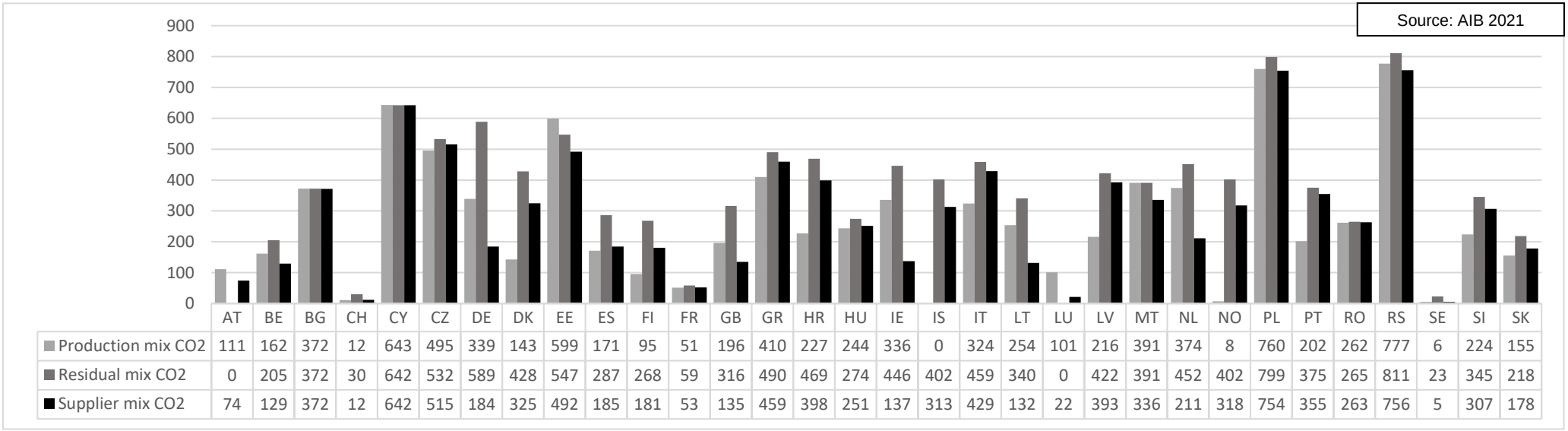
Table 3: Attributes [TWh] to/from the European Attribute Mix 2020[5]

	RE unspeci-fied	RE biomass	RE solar	RE geother-mal	RE wind	RE hydro	Nuclear	FO unspeci-fied	FO hard coal	FO lignite	FO oil	FO gas
AT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BE	0.00	0.22	0.43	0.00	0.09	0.00	2.60	0.10	0.17	0.00	0.00	2.24
BG	0.00	0.03	0.04	0.00	0.04	0.07	0.42	0.00	0.31	0.00	0.01	0.05
CH	0.00	0.30	0.64	0.00	0.01	2.47	10.85	0.55	0.00	0.00	0.01	0.52
CY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
CZ	0.00	0.30	0.20	0.00	0.04	0.06	3.56	0.01	0.23	3.50	0.01	0.84
DE	0.00	0.00	1.24	0.01	0.05	0.00	29.64	7.72	59.79	0.00	1.90	39.29
DK	0.00	-0.17	-0.47	0.00	-0.62	-0.05	-5.45	-0.63	-3.59	-0.26	-0.18	-5.94
EE	0.00	-0.06	-0.16	0.00	-0.21	-0.02	-1.86	-0.22	-1.23	-0.09	-0.06	-2.03
ES	0.00	-0.09	-0.25	0.00	-0.33	-0.03	-2.93	-0.34	-1.93	-0.14	-0.10	-3.19
FI	0.00	-0.18	-0.49	0.00	-0.64	-0.05	-5.63	-0.65	-3.70	-0.27	-0.19	-6.13
FR	0.00	0.00	0.89	0.01	2.12	0.34	26.81	0.00	0.29	0.00	0.33	3.39
GB	0.00	0.92	1.59	0.00	2.38	0.00	13.88	2.05	0.90	0.00	0.23	32.81
GR	0.00	-0.08	-0.21	0.00	-0.27	-0.02	-2.37	-0.27	-1.56	-0.11	-0.08	-2.59
HR	0.00	-0.09	-0.25	0.00	-0.33	-0.03	-2.94	-0.34	-1.94	-0.14	-0.10	-3.21
HU	0.00	-0.07	-0.18	0.00	-0.24	-0.02	-2.10	-0.24	-1.38	-0.10	-0.07	-2.29
IE	0.00	0.59	0.00	0.00	4.55	0.00	0.00	0.55	1.73	1.20	0.02	8.79
IS	0.00	-0.15	-0.40	0.00	-0.53	-0.63	-4.67	-0.54	-3.08	-0.22	-0.16	-5.09
IT	0.00	-1.03	-2.78	0.00	-3.65	-0.31	-32.14	-3.71	-21.15	-1.52	-1.08	-35.02

[5] Same as in previous figure 3, the renewable energy added to the EAM does not equal the renewable energy taken out of it. For more information refer to footnote 4.

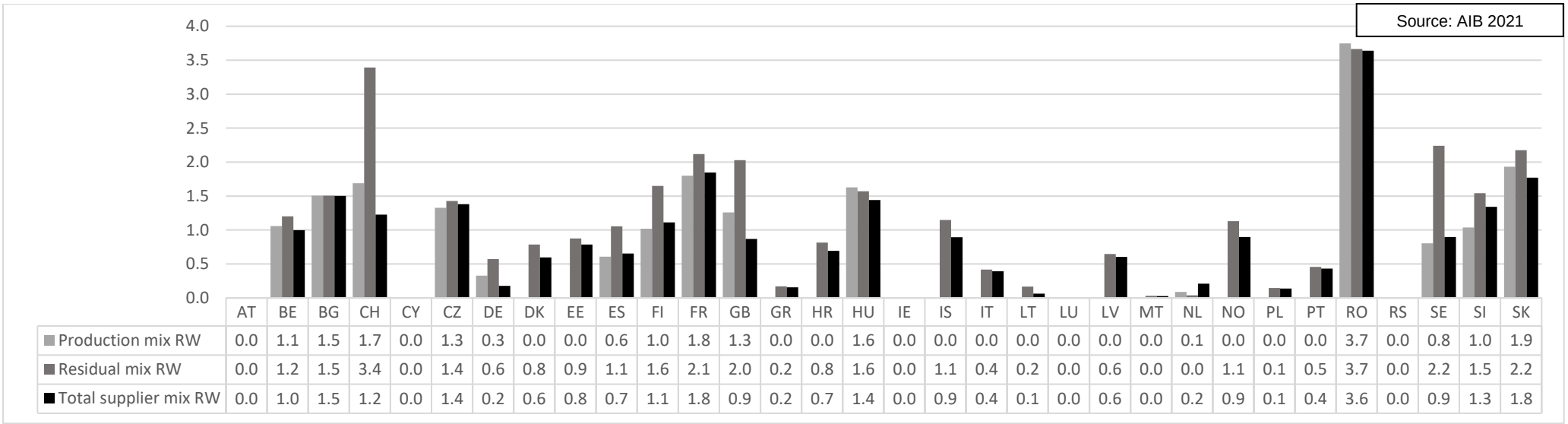
	RE unspeci-fied	RE biomass	RE solar	RE geother-mal	RE wind	RE hydro	Nuclear	FO unspeci-fied	FO hard coal	FO lignite	FO oil	FO gas
LT	0.00	0.27	0.04	0.00	0.81	0.34	0.19	0.04	0.16	0.00	0.05	2.30
LU	0.00	-0.01	0.00	0.00	0.00	-0.01	0.00	0.05	0.00	0.00	0.00	0.00
LV	0.00	-0.03	-0.09	0.00	-0.12	-0.01	-1.04	-0.12	-0.68	-0.05	-0.03	-1.13
MT	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.00	-0.01	0.00	0.00	-0.02
NL	0.00	0.00	3.69	0.00	0.07	0.21	0.41	0.00	3.07	0.00	0.80	20.13
NO	0.00	-1.02	-2.76	0.00	-3.61	-2.20	-31.82	-3.68	-20.94	-1.50	-1.07	-34.67
PL	0.00	-0.16	-0.43	0.00	-0.57	-0.05	-5.01	-0.58	-3.30	-0.24	-0.17	-5.46
PT	0.00	-0.19	-0.52	0.00	-0.68	-0.06	-5.97	-0.69	-3.93	-0.28	-0.20	-6.51
RO	0.00	0.00	0.01	0.00	0.03	0.06	0.05	0.00	0.04	0.00	0.00	0.03
RS	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.07	0.00	0.00
SE	0.00	0.62	0.00	0.00	1.33	0.00	12.91	0.64	0.00	0.02	0.04	0.00
SI	0.00	-0.02	-0.04	0.00	-0.05	-0.12	-0.42	-0.05	-0.27	-0.02	-0.01	-0.45
SK	0.00	-0.03	-0.08	0.00	-0.10	-0.01	-0.92	-0.11	-0.61	-0.04	-0.03	-1.01

Figure 4: Direct CO_2 content in Production, Residual and Total Supplier mix 2020 [gCO_2/kWh]



	AT	BE	BG	CH	CY	CZ	DE	DK	EE	ES	FI	FR	GB	GR	HR	HU	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	RS	SE	SI	SK
Production mix CO2	111	162	372	12	643	495	339	143	599	171	95	51	196	410	227	244	336	0	324	254	101	216	391	374	8	760	202	262	777	6	224	155
Residual mix CO2	0	205	372	30	642	532	589	428	547	287	268	59	316	490	469	274	446	402	459	340	0	422	391	452	402	799	375	265	811	23	345	218
Supplier mix CO2	74	129	372	12	642	515	184	325	492	185	181	53	135	459	398	251	137	313	429	132	22	393	336	211	318	754	355	263	756	5	307	178

Figure 5: Highly active radioactive waste content in the Production Mix, the Residual Mix and the Total Suppler Mix 2020 [mgRW/kWh]



	AT	BE	BG	CH	CY	CZ	DE	DK	EE	ES	FI	FR	GB	GR	HR	HU	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	RS	SE	SI	SK
Production mix RW	0.0	1.1	1.5	1.7	0.0	1.3	0.3	0.0	0.0	0.6	1.0	1.8	1.3	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	3.7	0.0	0.8	1.0	1.9
Residual mix RW	0.0	1.2	1.5	3.4	0.0	1.4	0.6	0.8	0.9	1.1	1.6	2.1	2.0	0.2	0.8	1.6	0.0	1.1	0.4	0.2	0.0	0.6	0.0	0.0	1.1	0.1	0.5	3.7	0.0	2.2	1.5	2.2
Total supplier mix RW	0.0	1.0	1.5	1.2	0.0	1.4	0.2	0.6	0.8	0.7	1.1	1.8	0.9	0.2	0.7	1.4	0.0	0.9	0.4	0.1	0.0	0.6	0.0	0.2	0.9	0.1	0.4	3.6	0.0	0.9	1.3	1.8

Table 4: Total Supplier Mix 2020

	Volume (TWh)	RE unspecified	RE biomass	RE solar	RE geothermal	RE wind	RE hydro	Nuclear	FO unspecified	FO hard coal	FO lignite	FO oil	FO gas	CO2 (gCO2/kWh)	Rad waste ()mg/kWh
AT	63.30	0.09 %	6.32 %	1.72 %	0.13 %	12.25 %	63.43 %	0.00 %	0.66 %	0.76 %	0.00 %	0.00 %	14.63 %	74.28	0.00
BE	81.50	0.62 %	7.27 %	5.56 %	0.47 %	7.53 %	14.58 %	36.89 %	1.02 %	1.86 %	0.00 %	0.01 %	24.20 %	129.30	1.00
BG	32.61	0.00 %	3.52 %	4.02 %	0.00 %	4.16 %	7.74 %	42.93 %	0.00 %	31.52 %	0.00 %	0.58 %	5.54 %	371.51	1.50
CH	59.85	0.00 %	0.75 %	1.81 %	0.00 %	0.61 %	68.35 %	25.56 %	2.28 %	0.05 %	0.00 %	0.00 %	0.58 %	12.24	1.23
CY	4.70	0.00 %	0.91 %	6.90 %	0.00 %	5.24 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	86.96 %	0.00 %	642.00	0.00
CZ	63.00	0.02 %	4.26 %	2.24 %	0.02 %	0.65 %	2.56 %	39.44 %	0.11 %	2.58 %	38.71 %	0.11 %	9.30 %	515.34	1.38
DE	471.83	0.52 %	3.90 %	9.79 %	0.24 %	29.59 %	24.97 %	6.64 %	1.73 %	13.40 %	0.00 %	0.43 %	8.80 %	184.23	0.18
DK	33.44	0.00 %	1.96 %	3.64 %	0.00 %	25.98 %	4.02 %	16.29 %	3.93 %	21.29 %	0.77 %	1.18 %	20.94 %	324.72	0.60
EE	8.65	0.00 %	5.25 %	2.10 %	0.00 %	4.77 %	3.91 %	21.52 %	23.10 %	14.16 %	1.02 %	0.73 %	23.45 %	491.72	0.79
ES	246.62	0.82 %	3.14 %	5.97 %	0.16 %	19.24 %	11.63 %	23.80 %	0.95 %	2.82 %	0.06 %	4.15 %	27.25 %	184.91	0.65
FI	80.76	0.14 %	7.77 %	1.96 %	0.19 %	7.42 %	18.86 %	35.34 %	1.68 %	11.58 %	0.33 %	0.50 %	14.22 %	180.82	1.11
FR	451.69	0.02 %	0.49 %	2.60 %	0.03 %	8.33 %	9.97 %	68.32 %	0.00 %	0.75 %	0.00 %	0.85 %	8.65 %	52.54	1.84
GB	293.15	0.06 %	13.94 %	8.77 %	0.00 %	34.16 %	4.11 %	10.85 %	1.60 %	0.70 %	0.00 %	0.18 %	25.64 %	135.21	0.87
GR	55.04	0.00 %	1.02 %	8.59 %	0.09 %	15.38 %	5.10 %	4.31 %	0.75 %	6.23 %	10.60 %	7.12 %	40.81 %	459.46	0.16
HR	15.58	0.00 %	1.45 %	1.72 %	0.15 %	2.86 %	14.14 %	18.89 %	2.18 %	18.45 %	0.89 %	0.73 %	38.54 %	398.44	0.69
HU	44.34	0.03 %	5.03 %	5.72 %	0.34 %	4.70 %	4.82 %	40.83 %	1.18 %	11.66 %	0.22 %	0.26 %	25.22 %	251.27	1.44
IE	35.90	1.12 %	2.23 %	0.79 %	0.00 %	36.63 %	30.04 %	0.00 %	0.02 %	0.07 %	0.05 %	0.60 %	28.43 %	137.31	0.00
IS	19.13	0.00 %	0.78 %	2.12 %	12.39 %	2.80 %	9.97 %	24.43 %	2.82 %	16.08 %	1.15 %	0.84 %	26.62 %	312.93	0.89
IT	300.87	0.05 %	2.77 %	4.87 %	0.53 %	2.15 %	5.70 %	10.68 %	1.97 %	16.27 %	0.50 %	3.62 %	50.88 %	428.71	0.39
LT	11.10	0.87 %	12.21 %	2.07 %	0.94 %	40.26 %	18.34 %	1.75 %	0.40 %	1.49 %	0.00 %	0.50 %	21.19 %	132.07	0.06
LU	5.25	0.16 %	4.38 %	2.80 %	0.00 %	8.39 %	80.54 %	0.00 %	1.49 %	0.00 %	0.00 %	0.00 %	2.24 %	21.82	0.00
LV	7.14	3.07 %	3.35 %	1.30 %	0.00 %	3.00 %	10.46 %	16.47 %	1.71 %	11.21 %	0.69 %	0.60 %	48.14 %	392.59	0.60

	Volume (TWh)	RE unspecified	RE biomass	RE solar	RE geothermal	RE wind	RE hydro	Nuclear	FO unspecified	FO hard coal	FO lignite	FO oil	FO gas	CO2 (gCO2/kWh)	Rad waste ()mg/kWh
MT	2.49	0.24 %	0.02 %	9.48 %	0.00 %	0.84 %	13.39 %	0.73 %	0.08 %	0.48 %	0.03 %	2.19 %	72.51 %	335.65	0.03
NL	116.02	0.09 %	3.78 %	3.15 %	0.09 %	35.91 %	8.19 %	7.78 %	2.32 %	3.04 %	0.00 %	0.23 %	35.43 %	211.32	0.21
NO	132.00	0.04 %	0.99 %	2.19 %	0.01 %	3.47 %	19.90 %	24.63 %	3.34 %	15.87 %	1.14 %	0.81 %	27.60 %	317.82	0.90
PL	154.14	0.00 %	3.24 %	1.48 %	0.00 %	6.92 %	1.44 %	3.78 %	2.50 %	66.53 %	0.15 %	0.12 %	13.84 %	754.50	0.14
PT	50.46	0.02 %	7.22 %	3.14 %	0.49 %	5.71 %	8.69 %	11.84 %	1.86 %	12.13 %	0.56 %	2.71 %	45.64 %	354.97	0.43
RO	53.49	0.00 %	0.62 %	3.23 %	0.00 %	13.08 %	28.91 %	22.36 %	0.00 %	16.35 %	0.00 %	0.13 %	15.32 %	263.36	3.64
RS	33.18	0.00 %	0.74 %	0.11 %	0.03 %	2.96 %	26.64 %	0.00 %	0.00 %	1.60 %	66.19 %	0.14 %	1.60 %	756.09	0.00
SE	133.61	0.71 %	8.08 %	0.89 %	0.00 %	9.96 %	46.29 %	33.19 %	0.74 %	0.00 %	0.05 %	0.04 %	0.05 %	4.60	0.90
SI	13.32	0.00 %	1.18 %	1.95 %	0.00 %	1.32 %	8.13 %	48.50 %	0.42 %	31.11 %	0.15 %	0.12 %	7.10 %	306.63	1.34
SK	25.88	0.00 %	6.24 %	3.47 %	0.00 %	4.47 %	9.22 %	50.47 %	1.99 %	3.97 %	3.46 %	1.31 %	15.39 %	177.87	1.77

Figure 6: Total Supplier Mix 2020

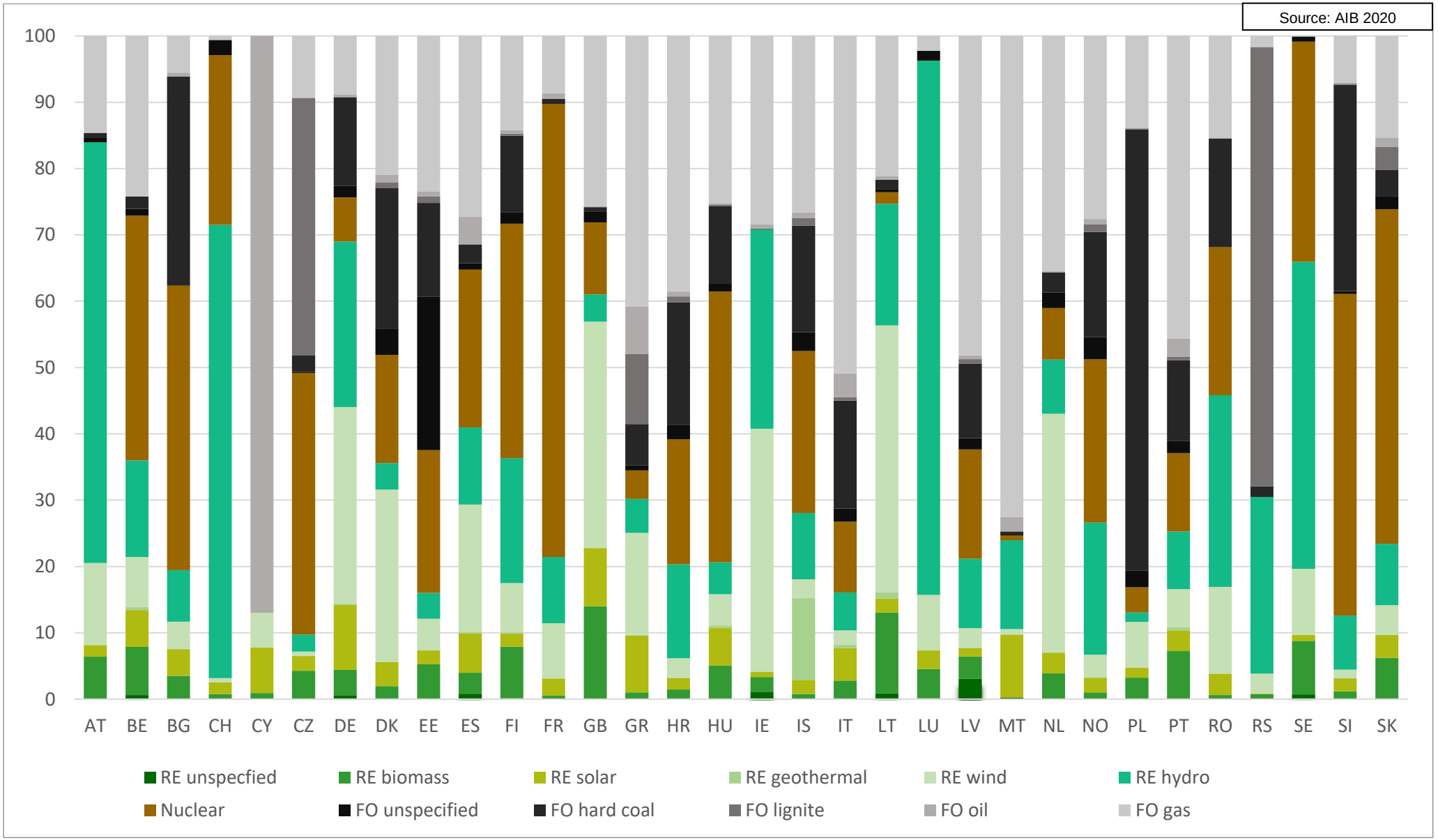


Table 5: Production Mix 2020[6]

	Volume [TWh]	RE unspecified	RE biomass	RE solar	RE geothermal	RE wind	RE hydro	Nuclear	FO unspecified	FO hard coal	FO lignite	FO oil	FO gas	CO2 (gCO2/kWh)	Rad waste (mg/kWh)
AT	65.89	0.00 %	4.58 %	0.00 %	0.00 %	11.38 %	62.99 %	0.00 %	0.95 %	3.66 %	0.00 %	0.95 %	15.48 %	111.18	0.00
BE	83.21	0.00 %	5.46 %	5.93 %	0.00 %	14.83 %	0.25 %	39.25 %	1.22 %	2.02 %	0.00 %	0.01 %	31.03 %	161.89	1.06
BG	36.75	0.00 %	3.52 %	4.03 %	0.00 %	4.03 %	7.73 %	43.00 %	0.00 %	31.57 %	0.00 %	0.58 %	5.55 %	372.12	1.50
CH	65.42	0.00 %	2.81 %	3.79 %	0.00 %	0.22 %	55.28 %	35.14 %	1.97 %	0.00 %	0.00 %	0.02 %	0.77 %	11.52	1.69
CY	4.70	0.00 %	0.91 %	6.91 %	0.00 %	5.10 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	87.08 %	0.00 %	642.90	0.00
CZ	74.92	0.00 %	6.45 %	2.96 %	0.00 %	0.92 %	2.89 %	37.93 %	0.11 %	2.48 %	37.22 %	0.11 %	8.94 %	495.49	1.33
DE	499.48	0.00 %	3.31 %	10.05 %	0.04 %	26.47 %	3.16 %	12.21 %	3.18 %	24.63 %	0.00 %	0.78 %	16.18 %	338.66	0.33
DK	27.24	0.00 %	15.40 %	4.34 %	0.00 %	60.04 %	0.06 %	0.00 %	2.52 %	12.97 %	0.00 %	0.77 %	3.91 %	142.52	0.00
EE	5.00	0.00 %	23.08 %	2.37 %	0.00 %	16.49 %	0.74 %	0.00 %	57.31 %	0.00 %	0.00 %	0.00 %	0.00 %	598.69	0.00
ES	247.37	0.00 %	2.10 %	7.97 %	0.00 %	22.14 %	12.00 %	22.54 %	0.81 %	2.03 %	0.00 %	4.10 %	26.30 %	171.03	0.61
FI	65.81	0.00 %	14.79 %	0.47 %	0.00 %	11.72 %	23.73 %	33.99 %	1.06 %	7.88 %	0.00 %	0.28 %	6.07 %	95.32	1.02
FR	503.01	0.00 %	0.51 %	2.66 %	0.02 %	7.90 %	12.27 %	66.68 %	0.00 %	0.73 %	0.00 %	0.83 %	8.39 %	51.28	1.80
GB	289.84	0.00 %	11.42 %	4.40 %	0.00 %	25.51 %	2.06 %	15.76 %	2.33 %	1.02 %	0.00 %	0.26 %	37.25 %	196.44	1.26
GR	46.18	0.00 %	0.93 %	9.68 %	0.00 %	20.38 %	7.04 %	0.00 %	0.30 %	0.00 %	12.39 %	8.30 %	40.97 %	410.01	0.00
HR	12.73	0.00 %	6.73 %	0.58 %	0.60 %	13.50 %	43.71 %	0.00 %	0.00 %	8.72 %	0.00 %	0.14 %	26.03 %	226.96	0.00
HU	32.66	0.00 %	5.56 %	7.22 %	0.03 %	1.91 %	0.73 %	46.49 %	0.85 %	10.18 %	0.00 %	0.10 %	26.93 %	243.75	1.63
IE	37.84	0.34 %	1.77 %	0.14 %	0.00 %	35.15 %	2.41 %	0.00 %	1.46 %	4.65 %	3.23 %	0.63 %	50.22 %	335.99	0.00

[6] The physical electricity imports and exports outside of the Residual mix calculation area are not included in these figures.

	Volume [TWh]	RE unspecified	RE biomass	RE solar	RE geothermal	RE wind	RE hydro	Nuclear	FO unspecified	FO hard coal	FO lignite	FO oil	FO gas	CO2 (gCO2/kWh)	Rad waste (mg/kWh)
IS	19.13	0.00 %	0.00 %	0.00 %	31.16 %	0.03 %	68.79 %	0.00 %	0.00 %	0.00 %	0.00 %	0.02 %	0.00 %	0.13	0.00
IT	271.23	0.00 %	6.45 %	9.42 %	2.08 %	6.84 %	17.00 %	0.00 %	0.82 %	10.25 %	0.00 %	3.61 %	43.53 %	323.84	0.00
LT	4.23	0.00 %	12.07 %	1.81 %	0.00 %	38.24 %	6.86 %	0.00 %	1.87 %	0.00 %	0.00 %	1.84 %	37.30 %	253.56	0.00
LU	1.16	0.00 %	31.53 %	15.36 %	0.00 %	29.58 %	4.55 %	0.00 %	4.99 %	0.00 %	0.00 %	0.00 %	13.98 %	101.36	0.00
LV	5.51	0.00 %	14.30 %	0.00 %	0.00 %	3.19 %	46.92 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	35.58 %	215.67	0.00
MT	2.08	0.28 %	0.00 %	11.27 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	0.00 %	2.59 %	85.85 %	390.62	0.00
NL	118.68	0.00 %	6.55 %	6.74 %	0.00 %	12.92 %	0.04 %	3.27 %	1.37 %	8.09 %	0.00 %	0.95 %	60.06 %	374.34	0.09
NO	153.43	0.00 %	0.15 %	0.00 %	0.00 %	6.46 %	91.82 %	0.00 %	0.48 %	0.00 %	0.00 %	0.00 %	1.09 %	7.62	0.00
PL	141.99	0.00 %	4.97 %	1.38 %	0.00 %	10.74 %	1.43 %	0.00 %	0.79 %	69.58 %	0.00 %	0.00 %	11.11 %	759.62	0.00
PT	50.99	0.00 %	8.57 %	3.23 %	0.40 %	23.90 %	24.39 %	0.00 %	0.53 %	4.29 %	0.00 %	2.29 %	32.40 %	201.55	0.00
RO	50.69	0.00 %	0.59 %	3.39 %	0.00 %	13.57 %	29.93 %	20.83 %	0.00 %	15.72 %	0.00 %	0.09 %	15.89 %	261.84	3.75
RS	34.87	0.00 %	0.49 %	0.04 %	0.00 %	2.77 %	25.52 %	0.00 %	0.00 %	0.00 %	69.39 %	0.14 %	1.64 %	776.69	0.00
SE	158.67	0.00 %	6.81 %	0.00 %	0.00 %	17.39 %	44.85 %	29.79 %	1.03 %	0.00 %	0.00 %	0.06 %	0.07 %	5.67	0.80
SI	15.71	0.00 %	1.29 %	1.83 %	0.00 %	0.04 %	30.92 %	38.45 %	0.05 %	24.62 %	0.00 %	0.01 %	2.78 %	224.05	1.04
SK	25.95	0.00 %	2.79 %	2.53 %	0.00 %	0.00 %	16.93 %	55.17 %	1.86 %	1.91 %	3.87 %	1.40 %	13.53 %	155.48	1.93

Figure 7: Production Mix (left) and Final Residual Mix (right) 2020

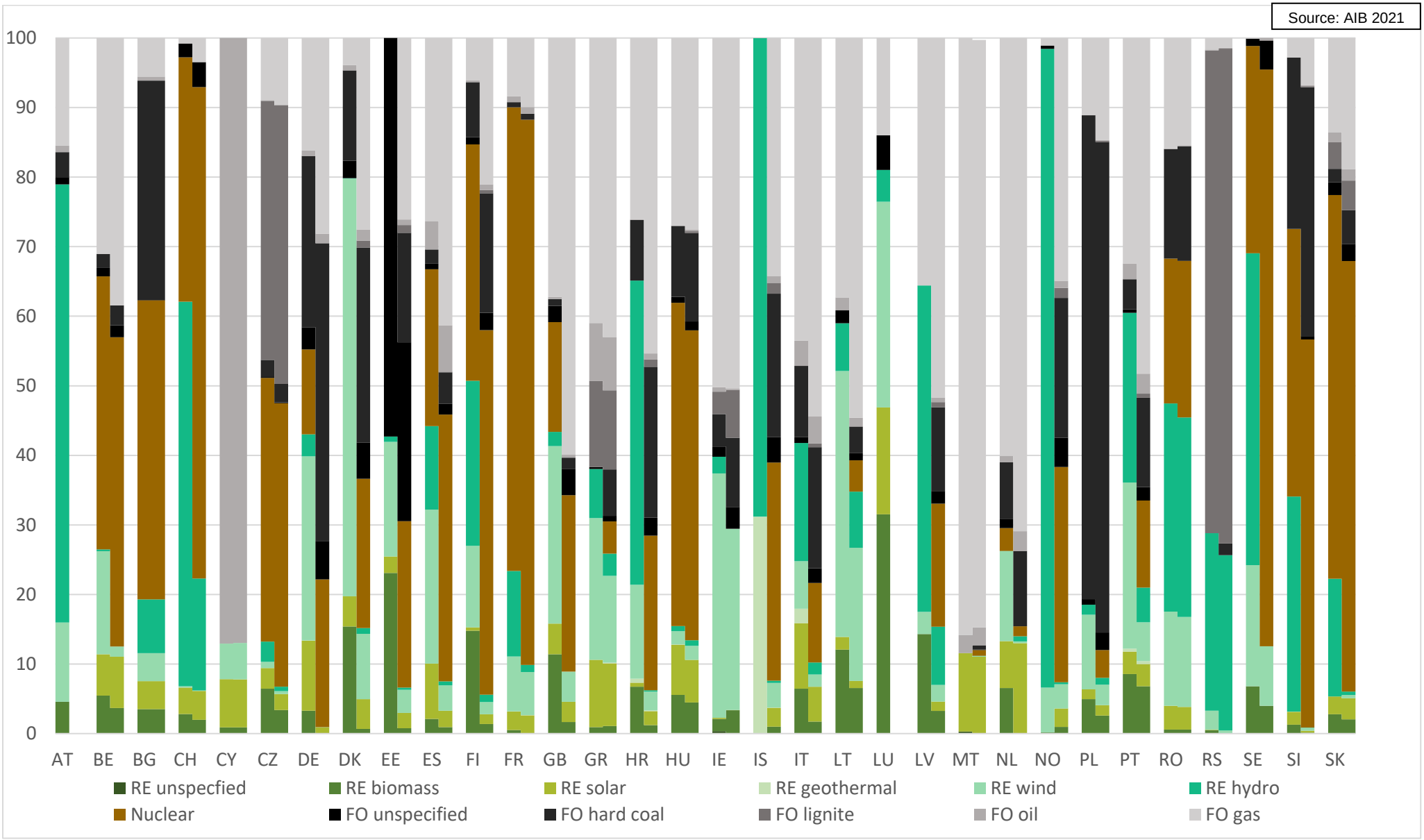


Figure 8: European Total Production Mix (left), Total of all available attributes in Final Residual Mixes (middle) and EAM (right) 2020

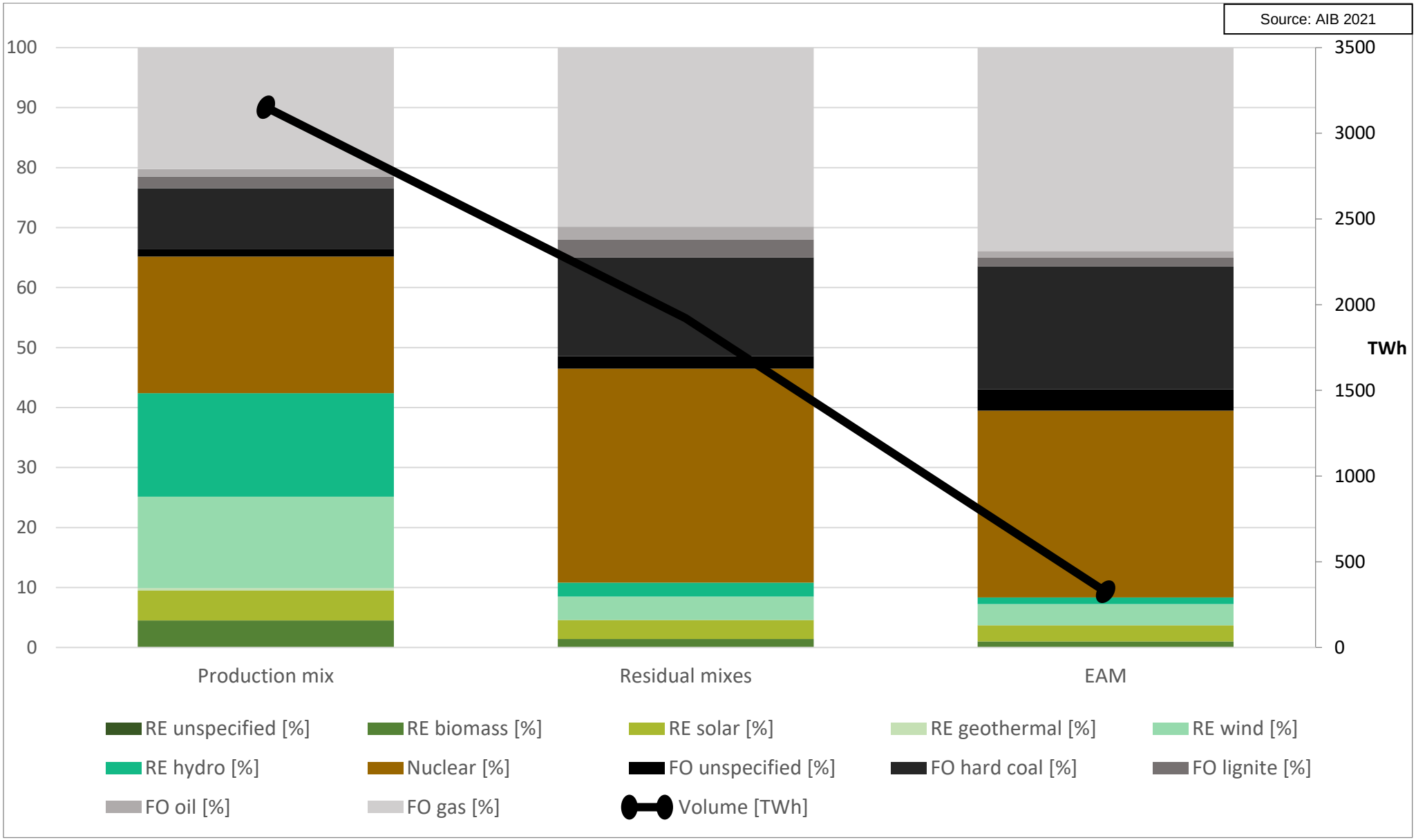


Table 6: European Total Production Mix, Total of all available attributes in Final Residual Mixes and European Attribute Mix 2020[7]

	Production mix	Residual mixes	European attribute mix
Volume [TWh]	3152.35	1920.56	325.46
RE unspecified %	0.00 %	0.00 %	0.00 %
RE biomass %	4.52 %	1.43 %	1.00 %
RE solar %	4.96 %	3.14 %	2.70 %
RE geothermal %	0.39 %	0.02 %	0.00 %
RE wind %	15.28 %	3.92 %	3.54 %
RE hydro %	17.25 %	2.30 %	1.10 %
Nuclear %	22.75 %	35.68 %	31.13 %
FO unspecified %	1.30 %	2.04 %	3.60 %
FO hard coal %	10.08 %	16.47 %	20.49 %
FO lignite %	1.90 %	3.02 %	1.47 %
FO oil %	1.31 %	2.11 %	1.05 %
FO gas %	20.24 %	29.87 %	33.92 %

[7] The EAM volume and percentages presented here do not exactly match numbers provided in Table 1. This is due to some countries having negative renewable energy balance in domestic residual mixes (caused by variation in disclosure periods and GO lifetimes overlapping two disclosure periods). This negativity is transferred into the EAM before considering the domestic residual mix attribute surpluses and deficits. This negativity correction is included in this Table 6 for statistics purposes. For any member state residual mix calculation the values from the Table 1 should be used.

Figure 9: Production Mix (left) and Total Supplier Mix (right) 2020

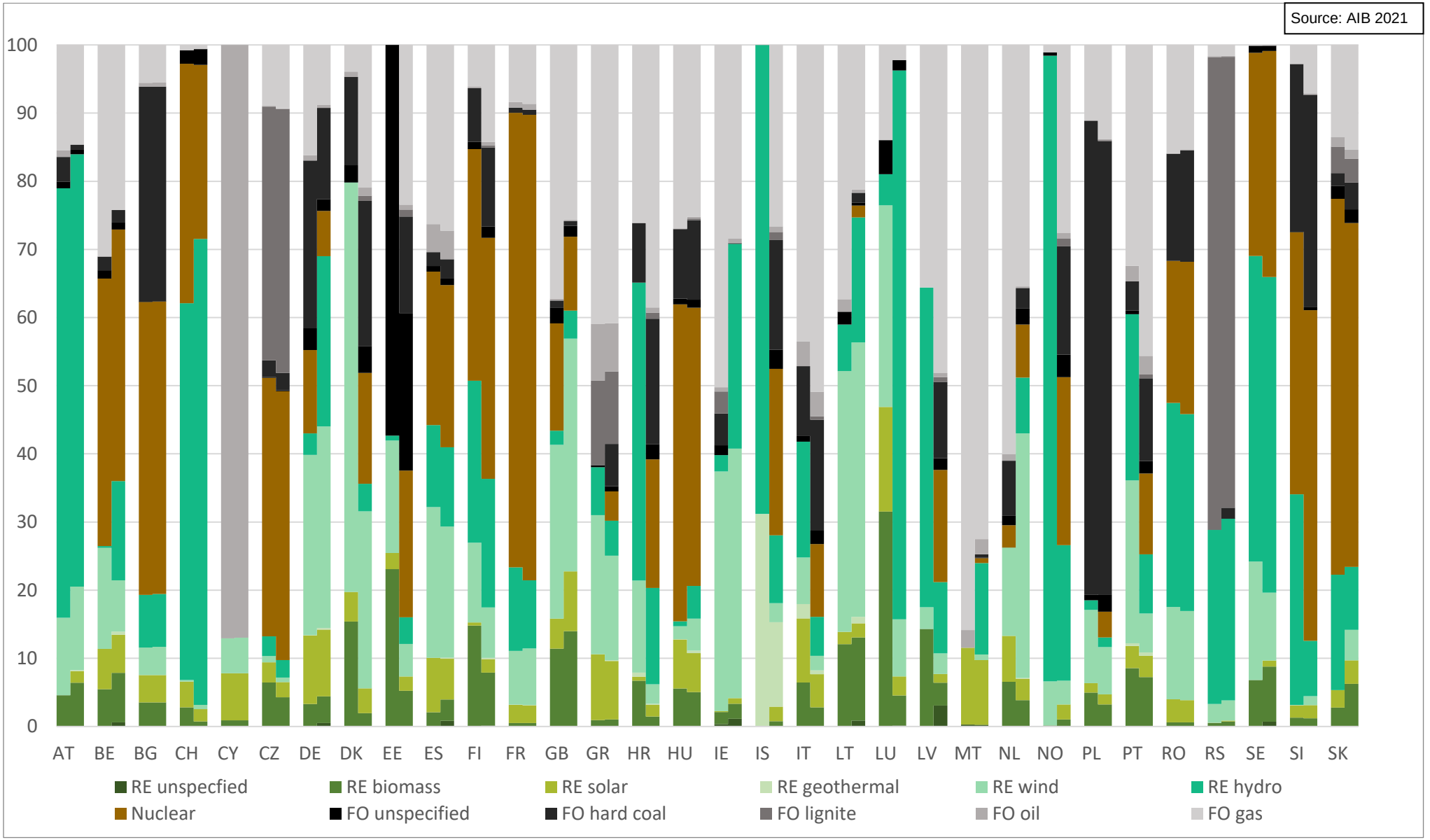
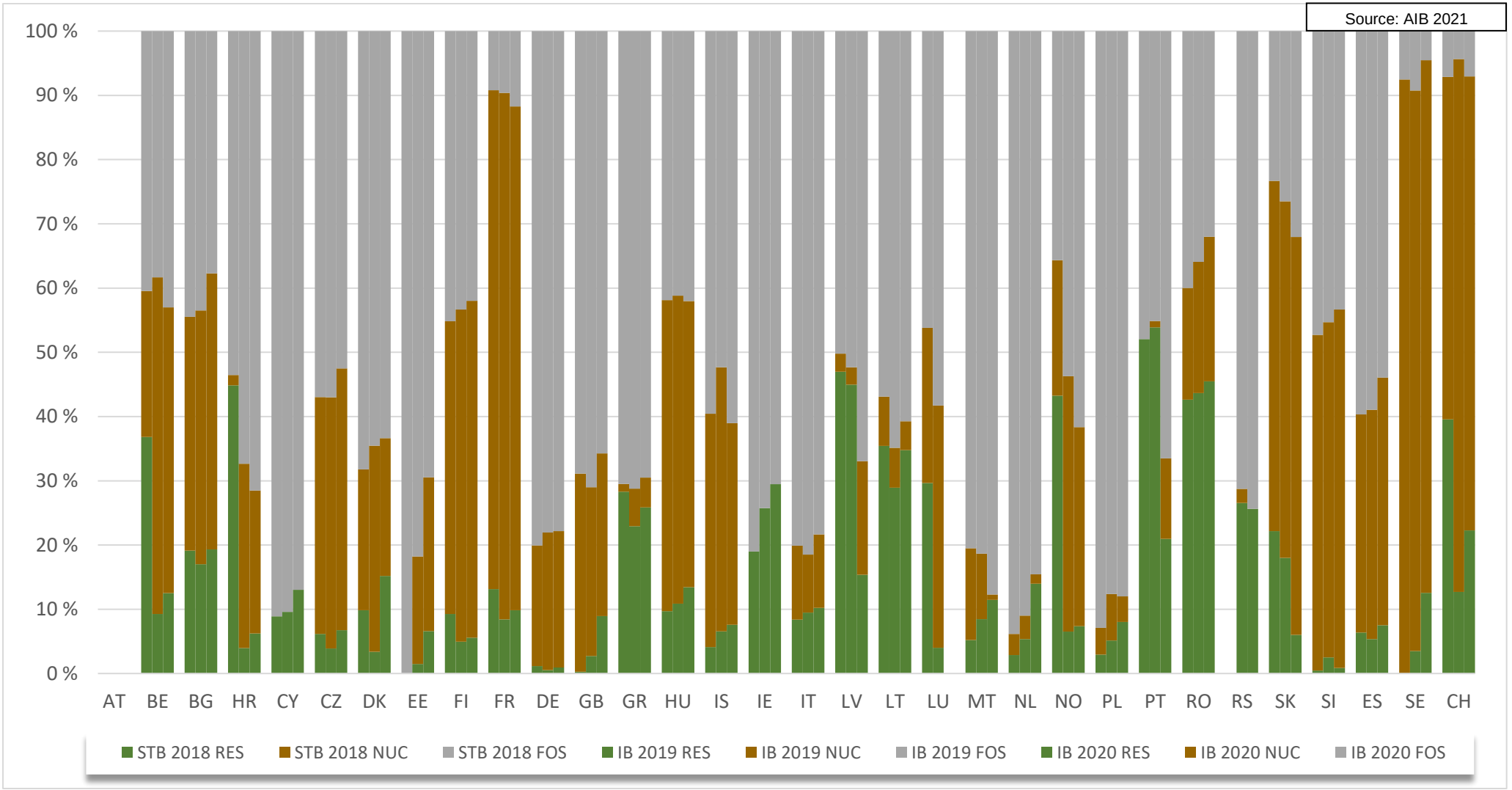


Figure 10: Residual Mixes 2018, 2019 and 2020[8]



[8] The years are not completely comparable because of a methodology change. Years up to 2018 are calculated with the Shifted Transaction Based method (STB) and starting from year 2019 the methodology was changed to Issuance Based method (IB).

Table 7: Residual Mixes 2018, 2019 and 2020

		2018 STB	2019 IB	2020 IB
AT	RES	0.0 %	0.0 %	0.0 %
	NUC	0.0 %	0.0 %	0.0 %
	FOS	0.0 %	0.0 %	0.0 %
BE	RES	36.8 %	9.3 %	12.5 %
	NUC	22.7 %	52.4 %	44.5 %
	FOS	40.5 %	38.3 %	43.0 %
BG	RES	19.1 %	17.0 %	19.3 %
	NUC	36.4 %	39.5 %	43.0 %
	FOS	44.5 %	43.5 %	37.7 %
HR	RES	44.8 %	3.9 %	6.2 %
	NUC	1.6 %	28.7 %	22.2 %
	FOS	53.5 %	67.3 %	71.5 %
CY	RES	8.9 %	9.6 %	13.0 %
	NUC	0.0 %	0.0 %	0.0 %
	FOS	91.1 %	90.4 %	87.0 %
CZ	RES	6.2 %	3.9 %	6.8 %
	NUC	36.9 %	39.1 %	40.8 %
	FOS	57.0 %	57.0 %	52.5 %
DK	RES	9.8 %	3.4 %	15.2 %
	NUC	22.0 %	32.1 %	21.5 %
	FOS	68.2 %	64.5 %	63.4 %
EE	RES	0.0 %	1.5 %	6.6 %
	NUC	0.0 %	16.7 %	23.9 %
	FOS	100.0 %	81.8 %	69.5 %
FI	RES	9.2 %	5.0 %	5.6 %
	NUC	45.6 %	51.7 %	52.4 %
	FOS	45.2 %	43.3 %	42.0 %
FR	RES	13.1 %	8.4 %	9.9 %
	NUC	77.6 %	82.0 %	78.4 %
	FOS	9.2 %	9.6 %	11.8 %
GB	RES	0.3 %	2.7 %	8.9 %
	NUC	30.8 %	26.3 %	25.3 %
	FOS	68.9 %	71.0 %	65.7 %
GR	RES	28.3 %	22.9 %	25.9 %
	NUC	1.2 %	5.8 %	4.6 %
	FOS	70.5 %	71.2 %	69.5 %
HU	RES	9.7 %	10.9 %	13.4 %
	NUC	48.4 %	47.9 %	44.5 %
	FOS	41.9 %	41.2 %	42.0 %
IS	RES	4.1 %	6.6 %	7.6 %
	NUC	36.3 %	41.1 %	31.4 %
	FOS	59.6 %	52.3 %	61.0 %
IE	RES	19.0 %	25.7 %	29.5 %
	NUC	0.0 %	0.0 %	0.0 %
	FOS	81.0 %	74.3 %	70.5 %
IT	RES	8.4 %	9.5 %	10.2 %
	NUC	11.5 %	9.0 %	11.4 %
	FOS	80.1 %	81.5 %	78.3 %
LV	RES	47.0 %	45.0 %	15.4 %
	NUC	2.8 %	2.7 %	17.7 %
	FOS	50.2 %	52.3 %	66.9 %
LT	RES	35.4 %	28.9 %	34.8 %
	NUC	7.7 %	6.2 %	4.5 %
	FOS	56.9 %	64.9 %	60.7 %
MT	RES	5.2 %	8.5 %	11.4 %
	NUC	14.3 %	10.2 %	0.9 %
	FOS	80.5 %	81.4 %	87.7 %
NL	RES	2.9 %	5.4 %	14.0 %
	NUC	3.3 %	3.6 %	1.5 %
	FOS	93.8 %	91.0 %	84.6 %
PL	RES	2.9 %	5.2 %	8.0 %
	NUC	4.2 %	7.2 %	4.0 %
	FOS	92.9 %	87.6 %	88.0 %
PT	RES	52.0 %	53.9 %	21.0 %
	NUC	0.0 %	1.0 %	12.5 %
	FOS	48.0 %	45.1 %	66.5 %
RO	RES	42.6 %	43.6 %	45.5 %
	NUC	17.4 %	20.4 %	22.5 %
	FOS	40.0 %	35.9 %	32.0 %
RS	RES	0.0 %	26.5 %	25.6 %
	NUC	0.0 %	2.2 %	0.0 %
	FOS	0.0 %	71.3 %	74.4 %
SK	RES	22.2 %	18.0 %	6.0 %
	NUC	54.5 %	55.5 %	61.9 %
	FOS	23.3 %	26.5 %	32.1 %
SI	RES	0.5 %	2.5 %	0.9 %
	NUC	52.3 %	52.2 %	55.8 %
	FOS	47.3 %	45.3 %	43.4 %
ES	RES	6.4 %	5.4 %	7.5 %
	NUC	33.9 %	35.7 %	38.5 %
	FOS	59.7 %	58.9 %	53.9 %
SE	RES	0.0 %	3.5 %	12.5 %
	NUC	92.5 %	87.3 %	82.9 %
	FOS	7.5 %	9.2 %	4.5 %
CH	RES	39.6 %	12.7 %	22.3 %
	NUC	53.3 %	83.0 %	70.7 %
	FOS	7.1 %	4.3 %	7.1 %

DE	**RES**	1.2 %	0.6 %	0.9 %
	NUC	18.8 %	21.4 %	21.2 %
	FOS	80.0 %	78.0 %	77.8 %

NO	**RES**	43.3 %	6.5 %	7.4 %
	NUC	21.1 %	39.8 %	31.0 %
	FOS	35.7 %	53.7 %	61.7 %

Annex 1: Fuel Categories

Table 8: Fuel category breakdown

Fact Sheet 5 compliance		Fuel code	Fuel description (including all subcategories)	Sub-table reference
Renewable	Unspecified & Other	F01000000	Renewable - Unspecified	
		F01040300	Renewable - Heat - Aerothermal	
		F01040400	Renewable - Heat - Hydrothermal	
		F01040501	Renewable - Heat - Process heat - Biogenic	
		F01050000	Renewable - Mechanical source or other - Unspecified	
	Solar	F01040100	Renewable - Heat - Solar	
	Wind	F01050100	Renewable - Mechanical source or other - Wind	
	Hydro & Marine	F01050200	Renewable - Mechanical source or other - Hydro & Marine	
	Geothermal	F01040200	Renewable - Heat - Geothermal	
	Biomass	F01010000	Renewable - Solid	
		F01020000	Renewable - Liquid	
		F01030000	Renewable - Gaseous	
Nuclear		F03010100	Nuclear - Solid - Radioactive fuel	
Fossil	Unspecified & Other	F02000000	Fossil - Unspecified	
		F02010000	Fossil - Solid - Unspecified	
		F02010400	Fossil - Solid - Municipal waste	
		F02010500	Fossil - Solid - Industrial and commercial waste	
		F02020000	Fossil - Liquid - Unspecified	
		F02030000	Fossil - Gaseous	T4
		F02040000	Fossil - Heat	
	Hard Coal	F02010100	Fossil - Solid - Hard coal	T1
	Brown Coal / Lignite	F02010300	Fossil - Solid - Peat	
		F02010200	Fossil - Solid - Brown coal	T2
	Natural Gas	F02030100	Fossil - Gaseous - Natural Gas	
		F02020200	Fossil - Liquid - Natural gas liquids	
	Oil	F02020100	Fossil - Liquid - Crude oil	
		F02020300	Fossil - Liquid - Petroleum products	T3

T1	Hard coal sub-categories	
0	F0201010	Unspecified
1	F0201010	Anthracite
2	F0201010	Bituminous coal
3	F0201010	Coking coal
4	F0201010	Coke-oven coke
5	F0201010	Lignite coke

T2	Brown coal sub-categories	
0	F0201020	Unspecified
1	F0201020	Sub-bituminous coal
2	F0201020	Lignite
3	F0201020	Brown coal briquette
4	F0201020	Peat briquette

T3	Petroleum products sub-categories	
0	F020203(	Unspecified
1	F020203(	Ethane
2	F020203(	Naphtha
3	F020203(	Aviation gasoline
4	F020203(	Motor gasoline
5	F020203(	Aviation turbine fuel
6	F020203(	Other kerosene
7	F020203(	Gas and diesel oil
8	F020203(	Fuel oil low-sulphur
9	F020203(	Fuel oil high-sulphur
10	F020203	Liquid petroleum gas
11	F020203	Orimulsion
12	F020203	Bitumen
13	F020203	Lubricants
14	F020203	Petroleum coke
15	F020203	Refinery feedstock

T4	Gaseous sub-categories		
0	F020300(	Unspecified	Unspecified
20	F020302(	Coal-derived gas	Unspecified
21	F020302(	Coal-derived gas	Blast furnace gas
22	F020302(	Coal-derived gas	Coke-oven gas
30	F020303(	Petroleum products	Unspecified
31	F020303(	Petroleum products	Propane
32	F020303(	Petroleum products	Butane
33	F020303(	Petroleum products	Refinery gas
34	F020303(	Petroleum products	Chemical waste gas
40	F020304(	Municipal gas plant	Unspecified
50	F020305(	Process gas	Unspecified
51	F020305(	Process gas	Carbon monoxide
52	F020305(	Process gas	Methane
53	F020305(	Process gas	Hydrogen (fossil sourced)
54	F020305(	Process gas	Phosphor gas
55	F020305(	Process gas	Oxy gas