

# Statistical Factsheet 2023

Provisional values as of April 2024

The Statistical Factsheet is based upon data reported to the ENTSO-E Central Transparency Platform, with the exception of grid statistics. Readers are reminded that the content of the Transparency Platform predominantly consists of operational data, which in some instances may be less suitable for statistical purposes.



# ENTSO-E in figures – Electricity system data of member TSOs in 2023

Area / Country	Aggregated generation																	Consumption			Area / Country						
	Non renewable net generation	Nuclear	Fossil fuels	Fossil Brown coal / Lignite	Fossil Coal-derived gas	Fossil Gas	Fossil Hard coal	Fossil Oil	Fossil Oil shale	Fossil Peat	Hydro Pumped Storage	Waste	Other non-renewable	Renewable Net Generation	Wind Offshore	Wind Onshore	Solar	Biomass	Geothermal	Hydro Run-of-river and poundage		Hydro Water Reservoir	Other renewable	Total net generation	Consumption of Hydro Pumped Storage	Net Consumption	
	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	
AL																									2.2	AL	
AT <sup>1</sup>	12.7		6.5			6.5					5.1	0.9	0.2	46.7		8.3	2.3	1.4	0.0	30.5	4.3		59.4	2.7	58.2	AT <sup>1</sup>	
BA	8.4		8.1	8.1										5.4		0.1	0.0			0.7	4.5		13.8	0.0	10.4	BA	
BE	55.5	31.3	15.3			15.3			0.0					22.5	7.9	6.3	7.2	0.9		0.2			78.0	1.2	78.9	BE	
BG <sup>2</sup>	31.9	16.2	15.7	13.0		2.2	0.5							7.8		1.5	3.1	0.2		1.3	1.7		39.7	0.0	36.1	BG <sup>2</sup>	
CH <sup>3</sup>	24.9	23.3										1.6		41.8		0.2	5.2	1.0		17.5	17.9		66.7	5.4	60.3	CH <sup>3</sup>	
CZ	61.1	28.7	30.5	25.1	0.2	3.3	1.8	0.1			1.1	0.2	0.7	10.4		0.7	2.8	2.2		1.1	1.2	2.4	71.6	1.4	60.9	CZ	
DE	197.2	6.7	170.9	77.8		50.1	39.7	3.1			11.1	6.7	1.8	251.0	23.5	118.8	55.2	37.8	0.2	13.4	1.0	1.0	448.2	14.1	458.0	DE	
DK	6.5		5.6			1.9	3.3	0.3						26.2	8.3	11.2	3.0	3.8					32.7	0.0	34.5	DK	
EE	2.6		2.5		0.4	0.0			2.0					2.0		0.8	0.7	0.5		0.0		0.0	4.6	0.0	8.1	EE	
ES	122.3	54.4	58.8			54.4	3.9	0.4			6.9	2.2	0.1	129.5		61.1	40.4	3.1		7.2	17.0	0.7	251.9	8.3	229.3	ES	
FI	39.5	32.7	6.0			1.8	1.9	0.0		2.3				34.5		14.0	0.9	5.3		14.3		0.0	74.0	0.0	78.9	FI	
FR	355.1	318.8	30.6			28.0	0.9	1.7			4.9	0.8		123.4	1.1	46.9	21.5	3.2		37.3	13.3		478.5	4.4	425.4	FR	
GB <sup>4</sup>	0.2		0.2			0.1	0.0	0.0						0.4		0.4							0.6	0.0	1.1	GB <sup>4</sup>	
GE	3.4		3.4			3.4								9.6		0.1					4.3	5.2		13.0	0.0	13.5	GE
GR	20.1		20.1	4.6		15.6								18.1		9.4	8.6				0.0		38.2	0.0	47.9	GR	
HR	5.3		4.7			3.4	1.2	0.1			0.6	0.1		10.4		2.5	0.1	0.6	0.0	1.9	5.0	0.2	15.7	0.1	17.8	HR	
HU	24.9	15.0	9.2	2.4		6.5	0.3	0.0				0.2	0.5	6.0		0.6	4.4	0.8	0.0	0.1	0.1	0.1	30.9	0.0	42.1	HU	
IE	10.9		10.6			7.5	1.1	1.6		0.3	0.3		0.0	10.4		9.7				0.7			21.3	0.4	16.8	IE	
IT	136.8		114.5		5.1	95.8	12.1	1.4			3.8	2.2	16.3	93.0	0.1	23.3	24.2	4.2	5.3	31.3	4.6		229.8	1.9	276.2	IT	
LT	1.7		0.6			0.6					0.5	0.4	0.1	3.7		2.4	0.7	0.3		0.4			5.5	0.7	11.7	LT	
LU <sup>5</sup>	0.2		0.1			0.1								1.0		0.5	0.3	0.2		0.1	0.0		1.1	0.0	4.7	LU <sup>5</sup>	
LV	1.5		1.4			1.4							0.2	4.2		0.3		0.2		3.7			5.7	0.0	6.5	LV	
MD	5.0		5.0			5.0								0.4		0.0	0.0	0.0		0.3			5.4	0.0	5.5	MD	
ME	1.4		1.4	1.4										2.1		0.3					1.7		3.4	0.0	2.9	ME	
MK	4.3		4.3	2.6		1.3		0.3						1.2		0.1					1.1		5.5	0.0	5.7	MK	
NL	88.1	3.8	43.1			31.1	12.0					3.0	38.2	20.6	11.6	8.3	0.5	0.2					108.8	0.0	109.2	NL	
NO	3.5		1.5			1.5					1.8	0.3		148.9		13.9				27.9	106.7	0.4	152.4	0.0	134.5	NO	
PL <sup>6</sup>	113.8		112.2	31.5	0.5	12.4	65.3	2.5			1.6			39.4		22.1	13.2	2.1		1.8	0.2		153.3	0.0	166.1	PL <sup>6</sup>	
PT <sup>7</sup>	14.9		9.9			9.9					4.8		0.2	29.3	0.1	12.8	3.6	2.9		6.6	3.2		44.2	3.7	50.7	PT <sup>7</sup>	
RO	29.0	11.2	17.8	7.9		9.6	0.3							27.6		7.5	1.5	0.4		11.2	7.2		56.6	0.0	53.3	RO	
RS	21.5		20.7	20.2		0.5					0.6		0.2	12.4		0.9		0.2		10.3	0.9		34.0	0.0	33.1	RS	
SE	53.9	46.6	0.0			0.0						7.3		101.2		34.2	1.1				65.9		155.0	0.0	130.6	SE	
SI	9.0	5.3	3.3	2.9		0.4		0.0			0.3	0.1		5.2		0.0	0.3	0.1		4.8			14.2	0.0	12.2	SI	
SK	22.9	18.2	3.4	0.8		2.0	0.1	0.4			0.3		1.0	6.3		0.0	0.5	0.8		4.2	0.4	0.4	29.2	0.5	25.4	SK	
XK <sup>8</sup>	5.1		5.1	5.1										0.1		0.1				0.0			5.2	0.0	6.4	XK <sup>8</sup>	
ENTSO-E <sup>***</sup>	1 494.9	612.1	742.6	203.4	6.2	371.7	144.6	12.1	2.0	2.6	44.9	21.9	73.3	1 252.9	52.5	419.3	201.3	72.5	5.6	233.3	263.1	5.2	2 747.8	44.8	2 715.3	ENTSO-E <sup>***</sup>	
%	54.40	22.28	27.02	7.40	0.23	13.53	5.26	0.44	0.07	0.10	1.64	0.80	2.67	45.60	1.91	15.26	7.33	2.64	0.20	8.49	9.58	0.19	100.00		%		
EU <sup>***</sup>	1 417.5	588.8	693.3	166.0	6.2	360.1	144.6	11.8	2.0	2.6	42.3	20.1	73.1	1 031.1	52.5	403.5	196.1	71.3	5.6	172.3	125.1	4.8	2 448.6	39.4	2 440.9	EU <sup>***</sup>	
%	57.9	24.0	28.3	6.8	0.3	14.7	5.9	0.5	0.1	0.1	1.7	0.8	3.0	42.1	2.1	16.5	8.0	2.9	0.2	7.0	5.1	0.2	100.0		%		

### Net Generation Capacity<sup>8</sup>

Area / Country	Net Generation Capacity <sup>8</sup>																							Area / Country	
	Non renewable net generation	Nuclear	Fossil fuels	Fossil Brown coal/Lignite	Fossil Coal-derived gas	Fossil Gas	Fossil Hard coal	Fossil Oil	Fossil Oil shale	Fossil Peat	Hydro Pumped Storage	Waste	Other non-renewable	Renewable Net Generation	Wind Offshore	Wind Onshore	Solar	Biomass	Geothermal	Hydro Run-of-river and poundage	Hydro Water Reservoir	Marine	Other renewable		Total NGC
	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW
AL	97	0	97				0	97		0				2 208			5	0		527	1 676			2 305	AL
AT <sup>1</sup>	8 637	0	4 326	0	0	4 206	0	120	0	0	3 363	103	845	15 989	0	3 569	3 265	482	0	5 902	2 771	0	0	24 626	AT <sup>1</sup>
BA	2 323		1 883	1 883							440			1 843		135				252	1 456			4 166	BA
BE	14 093	4 937	7 437			6 988		450			1 308	384	27	12 706	2 262	3 053	6 475	730		186				26 799	BE
BG <sup>9</sup>	8 741	2 080	5 791	4 119	0	1 322	350	0	0	0	864	6	0	6 008	0	705	2 879	74	0	540	1 810	0	0	14 749	BG <sup>9</sup>
CH <sup>10</sup>	7 789	2 979	301			301					4 152	363		18 133		87	4 730	251		5 011	8 054			25 922	CH <sup>10</sup>
CZ	15 292	4 040	9 980	7 160	380	1 240	1 200	0			1 172	100	0	4 354		339	2 083	410		340	772		410	19 646	CZ
DE	89 921	4 056	72 967	17 692	1 257	31 808	18 127	4 083			9 280	1 912	1 706	142 839	8 129	57 590	63 066	8 467	56	3 715	1 433		384	232 760	DE
DK	5 934		5 549			1 568	3 022	959						11 233	2 306	4 711	2 322	1 754		5			136	17 166	DK
EE	1 555		1 518		78	110			1 330			17	20	987		317	510	152		8				2 542	EE
ES	44 994	7 117	33 795	0	0	29 903	3 223	670	0	0	3 418	546	118	65 762	0	29 320	18 523	707	0	1 155	15 773	0	285	110 756	ES
FI	8 783	2 794	5 439			1 780	1 557	1 051		1 051		114	436	10 531		5 121	18	1 833		3 167			392	19 314	FI
FR	85 769	61 370	17 274			12 893	1 816	2 566			5 051	929	1 145	58 044	494	20 842	14 639	1 343	2	11 695	8 787	243		143 814	FR
GE	1 189		1 189			1 189								3 425		21				1 023	2 381			4 614	GE
GR	9 379		8 680	2 650		6 030		0			699			12 618		4 547	5 100	127	0	321	2 403		120	21 997	GR
HR	1 315		1 028			766	217	45			281	6		3 202		981	140	114	10	428	1 446		83	4 517	HR
HU	6 392	1 916	4 405	787		3 151	42	425				49	22	3 971		323	3 300	213	3	33	28		70	10 362	HU
IE	7 675		6 736			4 265	855	1 272		344	292			2 152		1 919			17	216				9 826	IE
IT	61 635		53 406	0	2 072	44 215	5 576	1 543			0	7 256	120	853	34 061	30	11 204	5 431	1 534	869	10 553	4 440	0	95 696	IT
LT	2 525		1 518			1 518		0			900	70	37	1 619		814	578	99		128			0	4 144	LT
LU <sup>4</sup>	91	0	70	0	0	70	0	0	0	0	0	21	0	532	0	152	300	47	0	22	11	0	0	623	LU <sup>4</sup>
LV	1 157		1 157			1 157								2 014		165	63	177		1 609				3 171	LV
ME	210		210	210										767		118				307	342			977	ME
MK	1 240		1 240	824		251		165						710		37	22	7			644			1 950	MK
NL	23 630	486	22 357	0	0	18 351	4 006	0	0	0	0	786	1	32 452	3 220	6 190	22 590	415	0	37	0	0	0	56 082	NL
NO	1 645		459			459					1 065	90	31	38 633		5 130				6 702	26 701		100	40 277	NO
PL	34 139		31 028	7 560	281	3 786	19 008	393			1 591		1 520	21 076		8 978	10 643	664		323	469			55 215	PL
PT	8 320	0	4 585	0	0	4 585	0	0	0	0	3 707	0	28	11 823	25	5 328	1 332	647	0	2 856	1 633	0	0	20 143	PT
RO	5 961	1 300	4 661	2 497		1 988	176							10 396		2 957	1 185	118		2 780	3 356			16 357	RO
RS	7 328		6 619	6 011		608					642	32	35	3 075		533	3	2		2 049	487			10 402	RS
SE	15 900	6 900												31 000		14 700					16 300			46 900	SE
SI	2 776	696	1 867	1 191		618		58			180	33		1 848		2	702	14		1 129				4 624	SI
UA	15 798	13 835									1 963			4 637							4 637			20 435	UA
XK <sup>*</sup>	1 288		1 288	1 288										204		136				33	35			1 492	XK <sup>*</sup>
ENTSO-E <sup>**</sup>	503 519	114 500	318 859	53 870	4 068	185 125	59 174	13 896	1 330	1 395	47 623	6 066	16 471	570 849	16 465	190 024	169 904	20 381	956	63 052	107 845	243	1 979	1 074 368	ENTSO-E <sup>**</sup>
%	46.87	10.66	29.68	5.01	0.38	17.23	5.51	1.29	0.12	0.13	4.43	0.56	1.53	53.13	1.53	17.69	15.81	1.90	0.09	5.87	10.04	0.02	0.18	100.00	%
EU <sup>***</sup>	464 613	97 692	305 573	43 655	4 068	182 317	59 174	13 634	1 330	1 395	39 362	5 581	16 405	497 216	16 465	183 827	165 144	20 121	956	47 149	61 432	243	1 880	961 829	EU <sup>***</sup>
%	48.31	10.16	31.77	4.54	0.42	18.96	6.15	1.42	0.14	0.14	4.09	0.58	1.71	51.69	1.71	19.11	17.17	2.09	0.10	4.90	6.39	0.03	0.20	100.00	%

<sup>1</sup> All values from Transparency Platform for Austria are for the control area AT and not the country AT (some power plants and lines located in Austria are part of the German control areas TenneT DE and TransnetBW).

<sup>2</sup> The presented figures for BG are actually gross generation and gross consumption, power plants auxiliary consumption is included. This is due to the fact that data for this report is taken from Transparency Platform.

<sup>3</sup> Data is taken from SFOE (Swiss Federal Office of Energy) and Pronovo. For Wind and Solar estimations based on model data have been used. Category "Hydro Water Reservoir" includes also "Hydro Pumped Storage".

<sup>4</sup> All data with the country code GB represents the available data in ENTSO-E Transparency Platform for England, Northern Ireland, Scotland and Wales.

<sup>5</sup> All values from Transparency Platform for Luxembourg are for the monitoring area LU and not the country LU (the power plant Vianden and the lines around it located in Luxembourg are part of the German control area Amprion/Creos and some industrial consumers are directly connected to the French and to the Belgian control areas).

<sup>6</sup> The presented figures for PL are actual net generation and gross consumption, consumption of Hydro Pump Storage is not included. This is analogous to Transparency Platform, which is the source of the reported data.

<sup>7</sup> Hydro Pumped Storage includes generation from natural flows and from pumped storage. This leads to a lower renewable generation share since generation from natural flows is not being considered renewable.

<sup>8</sup> Sum of generation capacity (MW) installed for all existing production units equaling to or exceeding 1 MW installed generation capacity as of 1<sup>st</sup> of January 2023.

<sup>9</sup> The given NGC for BG are gross figures.

<sup>10</sup> Data is taken from SFOE (Swiss Federal Office of Energy) and includes for some categories production units smaller than 1 MW.

<sup>\*</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

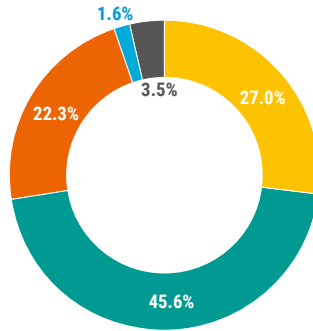
<sup>\*\*</sup> Calculated sum of the ENTSO-E member TSOs.

<sup>\*\*\*</sup> The 27 member countries of the EU are Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden. Please note that, as it does not have a TSO, Malta is not a member of ENTSO-E and thus the Statistical Factsheet includes data from all EU countries except Malta.

# Generation

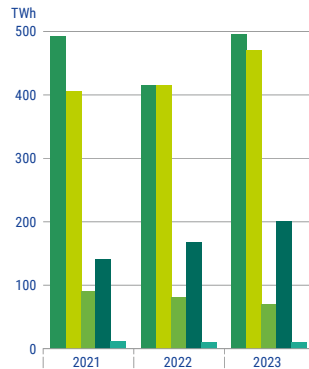
## Generation mix in ENTSO-E member TSOs in 2023<sup>1</sup>

	TWh
<b>Fossil fuels net generation</b> (lignite and hard coal, gas, oil, mixed fuels, peat)	742.6
<b>Renewable net generation</b> (renewable hydro, wind, solar, biomass, geothermal)	1 252.9
<b>Thermal nuclear net generation</b>	612.1
<b>Hydro net generation</b> (except renewable part)	44.9
<b>Net generation not identified</b>	95.3



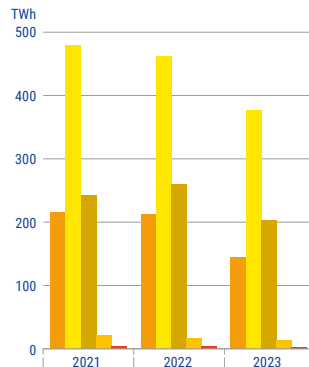
## ENTSO-E renewable generation<sup>1</sup>

	Year	TWh	%
<b>Renewable net generation</b>	2021	1 145.3	
	2022	1 093.1	
	2023	1 252.9	
of which hydro	2021	494.5	43%
	2022	416.2	38%
	2023	496.5	40%
of which wind	2021	407.3	36%
	2022	416.8	38%
	2023	471.8	37%
of which biomass	2021	90.2	8%
	2022	80.5	7%
	2023	72.5	6%
of which solar	2021	141.4	12%
	2022	168.3	15%
	2023	201.3	16%
of which other renewable	2021	11.9	1%
	2022	11.2	1%
	2023	10.8	1%

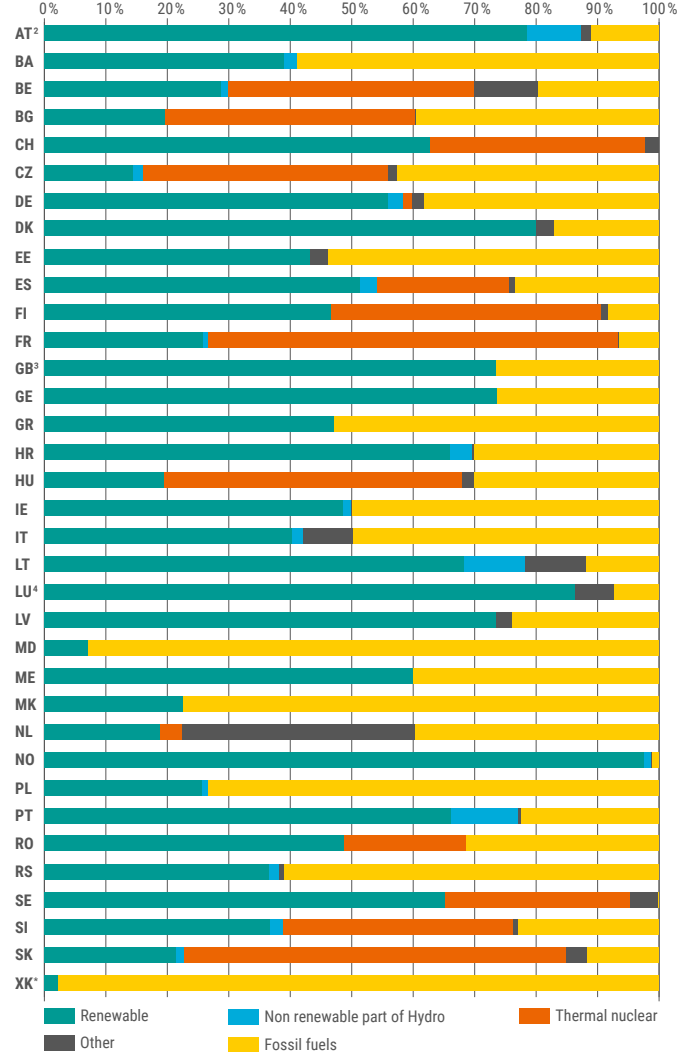


## ENTSO-E fossil fuels generation<sup>1</sup>

	Year	TWh	%
<b>Fossil fuels net generation</b>	2021	964.0	
	2022	955.3	
	2023	742.6	
of which hard coal	2021	214.1	22%
	2022	212.7	22%
	2023	144.6	19%
of which gas	2021	479.9	50%
	2022	462.6	48%
	2023	377.9	51%
of which lignite	2021	243.7	25%
	2022	259.4	27%
	2023	203.4	27%
of which oil	2021	22.1	2%
	2022	16.4	2%
	2023	14.1	2%
of which other fuels	2021	4.2	0.4%
	2022	4.1	0.4%
	2023	2.6	0.4%



## Share of energy produced of each member TSOs 2023 in %<sup>1</sup>



<sup>1</sup> Share of energy produced, based on the aggregated generation for each ENTSO-E TSO.

<sup>2</sup> All values from Transparency Platform for Austria are for the control area AT and not the country AT (some power plants and lines located in Austria are part of the German control areas TenneT DE and TransnetBW).

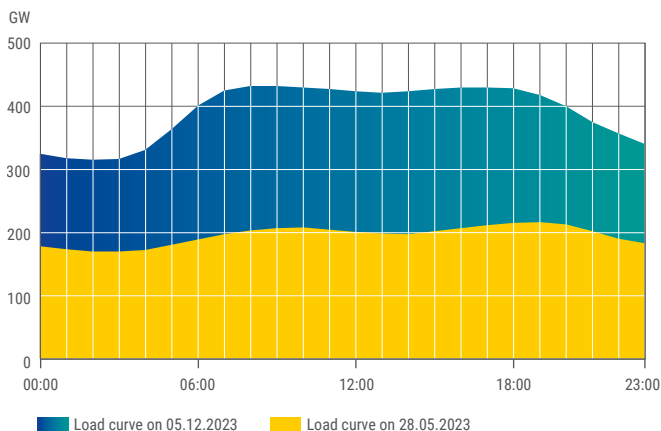
<sup>3</sup> All data with the country code GB represents the available data in ENTSO-E Transparency Platform for England, Northern Ireland, Scotland and Wales.

<sup>4</sup> All values from Transparency Platform for Luxembourg are for the monitoring area LU and not the country LU (the power plant Vianden and the lines around it located in Luxembourg are part of the German control area Amprion/Creos and some industrial consumers are directly connected to the French and to the Belgian control areas).

<sup>5</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

# ENTSO-E peak load 2023

## 2023 ENTSO-E load diagram on the days of the highest and lowest load values



## Values in MW on the days of highest and lowest ENTSO-E load values<sup>1,2</sup>

	05.12.2023 18:00 – 19:00	28.05.2023 05:00 – 06:00		05.12.2023 18:00 – 19:00	28.05.2023 05:00 – 06:00		05.12.2023 18:00 – 19:00	28.05.2023 05:00 – 06:00	
AL	1 259	693	FR	69 959	29 720	MK	980	368	
AT <sup>3</sup>	9 236	4 438	GE	1 769	1 393	NL	17 897	8 863	
BA	1 756	704	GR	6 549	4 123	NO	22 409	11 334	
BE	11 899	6 964	HR	2 764	1 467	PL <sup>6</sup>	25 767	13 185	
BG <sup>4</sup>	5 834	3 125	HU	6 811	3 085	PT	8 663	3 777	
CH	9 039	6 553	IE	5 310	2 633	RO	8 022	4 487	
CZ	9 466	5 107	IT	42 835	21 118	RS	5 127	2 728	
DE	69 669	35 317	LT	1 797	1 073	SE	23 053	10 961	
DK	5 095	2 813	LU <sup>5</sup>	721	385	SI	2 057	977	
EE	1 327	656	LV	1 004	565	SK	3 900	2 281	
ES	33 927	16 819	MD	835	471	XK <sup>*</sup>	1 108	367	
FI	12 296	6 985	ME	452	180				
							<b>ENTSO-E<sup>7</sup></b>	<b>430 591</b>	<b>215 713</b>

<sup>1</sup> This is the average of the hour.

<sup>2</sup> All times are in UTC.

<sup>3</sup> All values from Transparency Platform for Austria are for the control area AT and not the country AT (some power plants and lines located in Austria are part of the German control areas TenneT DE and TransnetBW).

<sup>4</sup> The presented load for BG includes power plant auxiliary consumption in it.

<sup>5</sup> All values from Transparency Platform for Luxembourg are for the monitoring area LU and not the country LU (the power plant Vianden and the lines around it located in Luxembourg are part of the German control area Amprion/Creos and some industrial consumers are directly connected to the French and to the Belgian control areas).

<sup>6</sup> Gross value.

<sup>7</sup> Calculated load values as sum of the ENTSO-E member TSOs.

<sup>\*</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

# Highest and lowest hourly load values for 2023 in MW<sup>1</sup>

	HIGHEST LOAD		VALUE	LOWEST LOAD		VALUE
	Date	Time <sup>2</sup>	(in MW)	Date	Time <sup>2</sup>	(in MW)
AL	08.02.23	17:00 – 18:00	1 542	02.01.23	04:00 – 05:00	439
AT <sup>3</sup>	04.12.23	08:00 – 09:00	10 318	18.06.23	02:00 – 03:00	4 014
BA	30.11.23	08:00 – 09:00	2 172	04.01.23	03:00 – 04:00	0
BE	04.12.23	10:00 – 11:00	12 597	30.07.23	02:00 – 03:00	5 930
BG <sup>4</sup>	08.02.23	17:00 – 18:00	7 198	29.10.23	01:00 – 02:00	31
CH	08.02.23	07:00 – 08:00	10 013	17.02.23	00:00 – 01:00	3 747
CZ	07.02.23	07:00 – 08:00	10 323	30.07.23	03:00 – 04:00	3 949
DE	04.12.23	16:00 – 17:00	73 587	18.06.23	02:00 – 03:00	30 909
DK	29.11.23	16:00 – 17:00	6 118	09.07.23	03:00 – 04:00	2 371
EE	07.12.23	09:00 – 10:00	1 555	24.06.23	06:00 – 07:00	484
ES	24.01.23	19:00 – 20:00	38 831	01.01.23	04:00 – 05:00	16 180
FI	27.11.23	15:00 – 16:00	13 210	24.06.23	01:00 – 02:00	5 273
FR	25.01.23	10:00 – 11:00	81 747	06.08.23	05:00 – 06:00	28 744
GB	07.11.23	18:00 – 19:00	1 316	10.06.23	04:00 – 05:00	477
GE	11.08.23	11:00 – 12:00	2 234	14.09.23	01:00 – 02:00	925
GR	21.07.23	10:00 – 11:00	10 967	02.04.23	12:00 – 13:00	2 730
HR	24.08.23	18:00 – 19:00	3 199	08.05.23	01:00 – 02:00	1 241
HU	30.11.23	15:00 – 16:00	7 079	01.05.23	11:00 – 12:00	2 779
IE	06.12.23	17:00 – 18:00	5 421	28.05.23	04:00 – 05:00	2 617
IT	19.07.23	14:00 – 15:00	52 630	26.12.23	02:00 – 03:00	16 499
LT	06.12.23	08:00 – 09:00	2 098	25.06.23	01:00 – 02:00	852
LU <sup>5</sup>	04.12.23	10:00 – 11:00	802	25.09.23	00:00 – 01:00	338
LV	07.12.23	08:00 – 09:00	1 116	25.06.23	01:00 – 02:00	423
MD	07.12.23	14:00 – 15:00	963	11.04.23	16:00 – 17:00	0
ME	13.12.23	02:00 – 03:00	704	09.05.23	02:00 – 03:00	97
MK	04.02.23	21:00 – 22:00	1 417	26.03.23	01:00 – 02:00	0
NL	07.12.23	16:00 – 17:00	20 060	26.02.23	12:00 – 13:00	6 768
NO	04.12.23	15:00 – 16:00	23 305	01.07.23	01:00 – 02:00	9 608
PL <sup>6</sup>	07.12.23	10:00 – 11:00	27 106	01.01.23	03:00 – 04:00	11 454
PT	26.01.23	19:00 – 20:00	9 296	09.04.23	03:00 – 04:00	3 543
RO	07.12.23	07:00 – 08:00	8 623	27.09.23	04:00 – 05:00	1 463
RS	08.02.23	08:00 – 09:00	5 581	25.03.23	23:00 – 00:00	0
SE	06.12.23	16:00 – 17:00	24 332	16.07.23	04:00 – 05:00	8 259
SI	08.02.23	17:00 – 18:00	2 296	07.11.23	20:00 – 21:00	93
SK	05.12.23	08:00 – 09:00	4 107	13.08.23	01:00 – 02:00	1 905
XK <sup>*</sup>	08.02.23	21:00 – 22:00	1 357	09.06.23	03:00 – 04:00	293

<sup>1</sup> This is the average of the hour.

<sup>2</sup> All times are in UTC.

<sup>3</sup> All values from Transparency Platform for Austria are for the control area AT and not the country AT (some power plants and lines located in Austria are part of the German control areas TenneT DE and TransnetBW).

<sup>4</sup> The presented load for BG includes power plant auxiliary consumption in it.

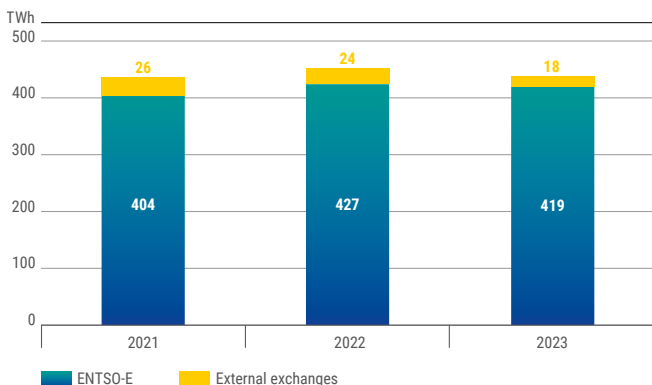
<sup>5</sup> All values from Transparency Platform for Luxembourg are for the monitoring area LU and not the country LU (the power plant Vianden and the lines around it located in Luxembourg are part of the German control area Amprion/Creos and some industrial consumers are directly connected to the French and to the Belgian control areas).

<sup>6</sup> Gross value

<sup>\*</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

# Development of exchanges

## Development of overall cross-border exchanges of ENTSO-E member TSOs



## Overview electricity exchanges for the past 3 years in GWh

	All Exchanges	ENTSO-E	External <sup>1</sup>
2021	429 314	403 805	25 509
2022	450 653	426 631	24 022
2023	437 253	419 214	18 039

<sup>1</sup> External exchanges include Andorra, Armenia, Azerbaijan, Belarus, Georgia, Iraq, Iran, Moldova, Morocco, Russia, Syria and Ukraine

**Publisher:** ENTSO-E aisbl  
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**Contribution:** ENTSO-E Market Information and Transparency Working Group and Transparency Platform Coordinators

**Design:** DreiDreizehn GmbH, Berlin | [www.313.de](http://www.313.de)

**Images:** iStockphoto.com

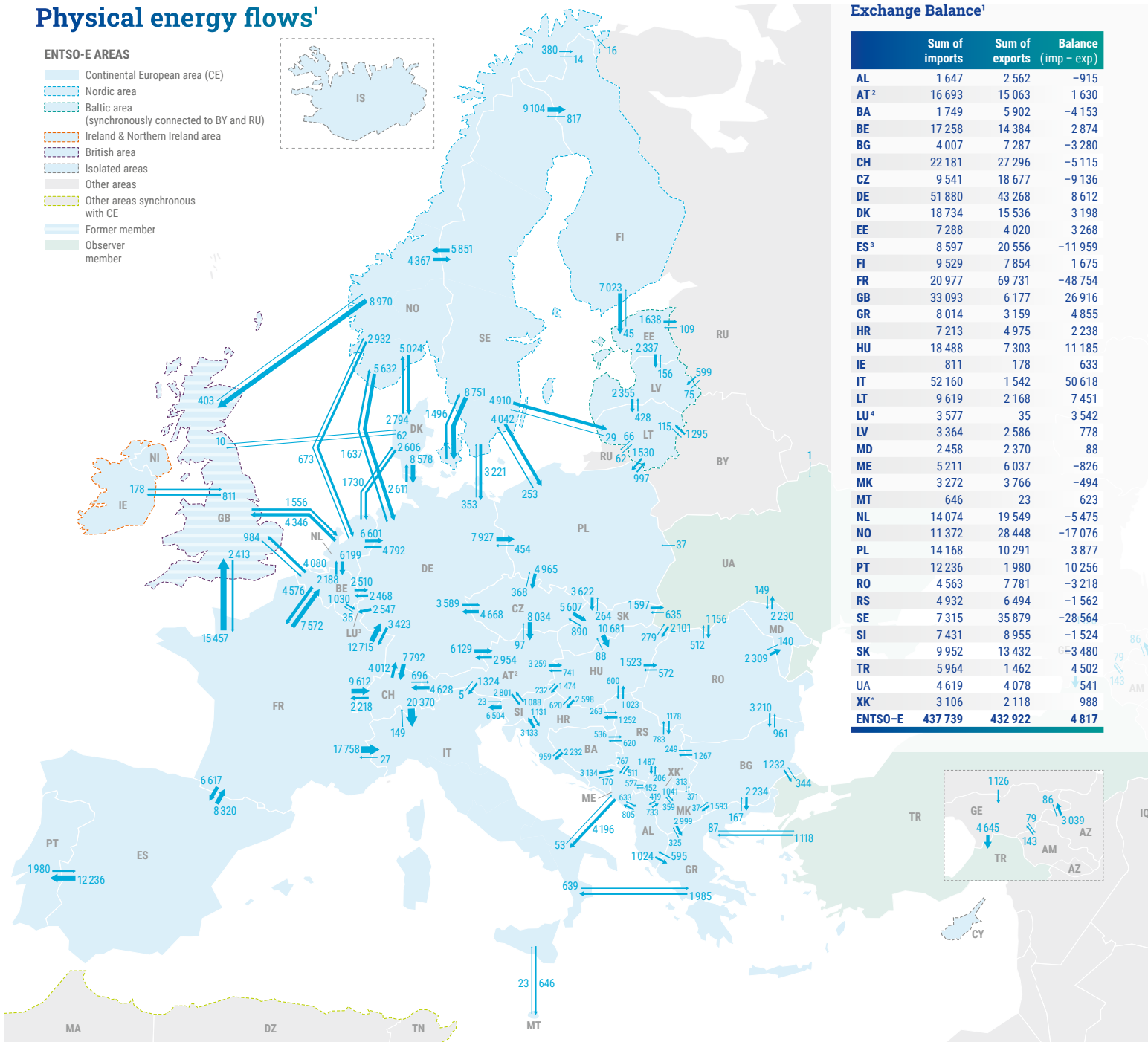
**Publishing date:** April 2024



# Physical energy flows<sup>1</sup>

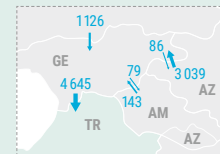
## ENTSO-E AREAS

- Continental European area (CE)
- Nordic area
- Baltic area (synchronously connected to BY and RU)
- Ireland & Northern Ireland area
- British area
- Isolated areas
- Other areas
- Other areas synchronous with CE
- Former member
- Observer member

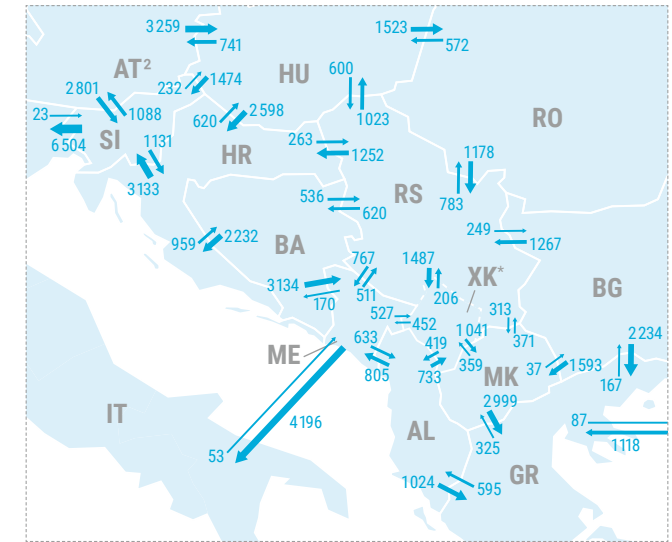


## Exchange Balance<sup>1</sup>

	Sum of imports	Sum of exports	Balance (imp - exp)
AL	1 647	2 562	-915
AT <sup>2</sup>	16 693	15 063	1 630
BA	1 749	5 902	-4 153
BE	17 258	14 384	2 874
BG	4 007	7 287	-3 280
CH	22 181	27 296	-5 115
CZ	9 541	18 677	-9 136
DE	51 880	43 268	8 612
DK	18 734	15 536	3 198
EE	7 288	4 020	3 268
ES <sup>3</sup>	8 597	20 556	-11 959
FI	9 529	7 854	1 675
FR	20 977	69 731	-48 754
GB	33 093	6 177	26 916
GR	8 014	3 159	4 855
HR	7 213	4 975	2 238
HU	18 488	7 303	11 185
IE	811	178	633
IT	52 160	1 542	50 618
LT	9 619	2 168	7 451
LU <sup>4</sup>	3 577	35	3 542
LV	3 364	2 586	778
MD	2 458	2 370	88
ME	5 211	6 037	-826
MK	3 272	3 766	-494
MT	646	23	623
NL	14 074	19 549	-5 475
NO	11 372	28 448	-17 076
PL	14 168	10 291	3 877
PT	12 236	1 980	10 256
RO	4 563	7 781	-3 218
RS	4 932	6 494	-1 562
SE	7 315	35 879	-28 564
SI	7 431	8 955	-1 524
SK	9 952	13 432	-3 480
TR	5 964	1 462	4 502
UA	4 619	4 078	541
XK <sup>5</sup>	3 106	2 118	988
<b>ENTSO-E</b>	<b>437 739</b>	<b>432 922</b>	<b>4 817</b>



## Map section of the Balkans



- <sup>1</sup> Hourly netted physical flow values measured in GWh.
- <sup>2</sup> All values from Transparency Platform for Austria are for the control area AT and not the country AT (some power plants and lines located in Austria are part of the German control areas TenneT DE and TransnetBW).
- <sup>3</sup> All data with the country code GB represents the available data in ENTSO-E Transparency Platform for England, Northern Ireland, Scotland and Wales.
- <sup>4</sup> All values from Transparency Platform for Luxembourg are for the monitoring area LU and not the country LU (the power plant Vianden and the lines around it located in Luxembourg are part of the German control area Amprion/Creos and some industrial consumers are directly connected to the French and to the Belgian control areas).
- <sup>5</sup> This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.





# Grid information

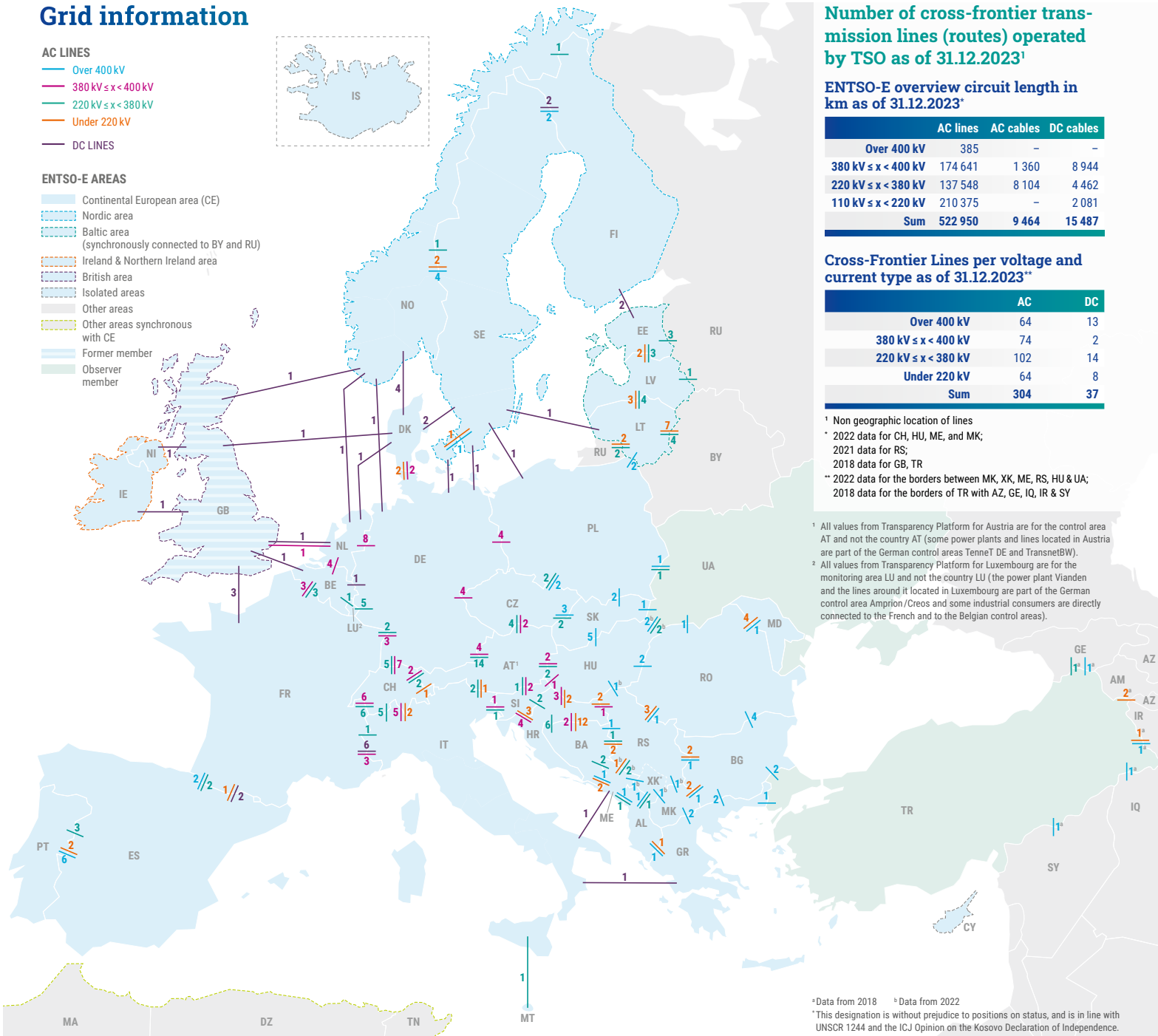
## AC LINES

- Over 400 kV
- 380 kV ≤ x < 400 kV
- 220 kV ≤ x < 380 kV
- Under 220 kV

## DC LINES

## ENTSO-E AREAS

- Continental European area (CE)
- Nordic area
- Baltic area (synchronously connected to BY and RU)
- Ireland & Northern Ireland area
- British area
- Isolated areas
- Other areas
- Other areas synchronous with CE
- Former member
- Observer member



## Number of cross-frontier transmission lines (routes) operated by TSO as of 31.12.2023<sup>1</sup>

### ENTSO-E overview circuit length in km as of 31.12.2023<sup>2</sup>

	AC lines	AC cables	DC cables
Over 400 kV	385	-	-
380 kV ≤ x < 400 kV	174 641	1 360	8 944
220 kV ≤ x < 380 kV	137 548	8 104	4 462
110 kV ≤ x < 220 kV	210 375	-	2 081
<b>Sum</b>	<b>522 950</b>	<b>9 464</b>	<b>15 487</b>

### Cross-Frontier Lines per voltage and current type as of 31.12.2023<sup>3</sup>

	AC	DC
Over 400 kV	64	13
380 kV ≤ x < 400 kV	74	2
220 kV ≤ x < 380 kV	102	14
Under 220 kV	64	8
<b>Sum</b>	<b>304</b>	<b>37</b>

<sup>1</sup> Non geographic location of lines

<sup>2</sup> 2022 data for CH, HU, ME, and MK;

2021 data for RS;

2018 data for GB, TR

<sup>3</sup> 2022 data for the borders between MK, XK, ME, RS, HU & UA; 2018 data for the borders of TR with AZ, GE, IQ, IR & SY

<sup>1</sup> All values from Transparency Platform for Austria are for the control area AT and not the country AT (some power plants and lines located in Austria are part of the German control areas TenneT DE and TransnetBW).

<sup>2</sup> All values from Transparency Platform for Luxembourg are for the monitoring area LU and not the country LU (the power plant Vianden and the lines around it located in Luxembourg are part of the German control area Amprion/Creos and some industrial consumers are directly connected to the French and to the Belgian control areas).

<sup>4</sup>Data from 2018    <sup>5</sup>Data from 2022

<sup>3</sup>This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

# Members of ENTSO-E

<b>AL</b>	Albania	OST	OST sh.a – Albanian Transmission System Operator
<b>AT</b>	Austria	APG VUEN	Austrian Power Grid AG Vorarlberger Übertragungsnetz GmbH
<b>BA</b>	Bosnia and Herzegovina	NOS BiH	Nezavisni operator sustava u Bosni i Hercegovini
<b>BE</b>	Belgium	Elia	Elia System Operator SA
<b>BG</b>	Bulgaria	ESO	Electroenergien Sistemen Operator EAD (Електроенергиен системен оператор)
<b>CH</b>	Switzerland	Swissgrid	Swissgrid AG
<b>CY</b>	Cyprus	Cyprus TSO	Cyprus Transmission System Operator
<b>CZ</b>	Czech Republic	ČEPS	ČEPS a.s.
<b>DE</b>	Germany	TransnetBW TenneT DE Amprion 50Hertz	TransnetBW GmbH TenneT TSO GmbH Amprion GmbH 50Hertz Transmission GmbH
<b>DK</b>	Denmark	Energinet	Energinet.dk
<b>EE</b>	Estonia	Elering AS	Elering AS
<b>ES</b>	Spain	REE	Red Eléctrica de España S.A.U.
<b>FI</b>	Finland	Fingrid	Fingrid Oyj
<b>FR</b>	France	RTE	Réseau de Transport d'Electricité
<b>GR</b>	Greece	IPTO	Independent Power Transmission Operator S.A.
<b>HR</b>	Croatia	HOPS	HOPS d.d.
<b>HU</b>	Hungary	MAVIR ZRt.	MAVIR Magyar Villamosenergia-ipari Átviteli Rendszerirányító Zártkörűen Működő Részvénytársaság
<b>IE</b>	Ireland	EirGrid	EirGrid plc
<b>IS</b>	Iceland	Landsnet	Landsnet hf
<b>IT</b>	Italy	Terna	Terna – Rete Elettrica Nazionale SpA
<b>LT</b>	Lithuania	Litgrid	Litgrid AB
<b>LU</b>	Luxembourg	Creos Luxembourg	Creos Luxembourg S.A.
<b>LV</b>	Latvia	AST	AS Augstsprieguma tīkls
<b>ME</b>	Montenegro	CGES AD	Crnogorski elektroprenosni sistem AD
<b>MK</b>	Republic of North Macedonia	MEPSO	Transmission System Operator of the Republic of North Macedonia
<b>NI</b>	Northern Ireland <sup>1</sup>	SONI	System Operator for Northern Ireland Ltd
<b>NL</b>	The Netherlands	TenneT NL	TenneT TSO B.V.
<b>NO</b>	Norway	Statnett	Statnett SF
<b>PL</b>	Poland	PSE S.A.	Polskie Sieci Elektroenergetyczne S.A.
<b>PT</b>	Portugal	REN	Rede Eléctrica Nacional, S.A.
<b>RO</b>	Romania	Transelectrica	C.N. Transelectrica S.A.
<b>RS</b>	Serbia	EMS	Akcionarsko društvo Elektromreža Srbije
<b>SE</b>	Sweden	Svenska Kraftnät	Svenska Kraftnät
<b>SI</b>	Slovenia	ELES	ELES, d.o.o.
<b>SK</b>	Slovak Republic	SEPS	Slovenská elektrizačná prenosová sústava, a.s.
<b>UA</b>	Ukraine	Ukrenergo	National Power Company Ukrenergo

## Observer member

<b>MD</b>	Moldova	Î.S. „Moldelectrica”	Moldelectrica
<b>TR</b>	Turkey	TEİAŞ	Turkish Electricity Transmission Corporation

<sup>1</sup> In compliance with 12 February 2021 EC Notice to Stakeholders on the Withdrawal of the UK and EU rules in the field of the Internal Energy Market.

# Contact

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