

ANNEXE 2. Tables of the European Environment Agency

The statistics are taken from the individual results of 21 European countries, which are: Austria, Bulgaria, Cyprus, Czech Republic, Denmark, Germany, Greece, Finland, France, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Romania, Spain, Sweden, Slovenia and the United Kingdom.

2.1. Total contribution from renewable energy sources (RES) for 21 countries

	Energy				Share [%] ^a	Average annual growth		
	2005 [Mtoe]	2010 [Mtoe]	2015 [Mtoe]	2020 [Mtoe]		2005 – 2010 [%/year]	2010 – 2015 [%/year]	2015 – 2020 [%/year]
RES-E	41	54	73	98	45	5.5	6.4	6.0
RES-H/C	49	57	72	94	43	3.3	4.8	5.5
RES-T ^b	3	12	17	25	12	32.0	6.8	8.4
Total RES	93	123	163	218	100	5.8	5.7	6.0

^a The percentage refers to the share of the renewable energy types (electricity, heating and cooling and transport) in total renewable energy in the year 2020

^b Total renewable energy for transport has been corrected for electricity and hydrogen from renewable energy sources as indicated in Article 5.1 of Directive 2009/28/EC. See Table 6.

The largest contribution of renewable energy originates from electricity (RES-E, 45% in 2020). The second largest contribution is from renewable heating and cooling (RES-H/C, 43%) and finally renewable transport (RES-T) contributes 12% to the overall renewable target.

2.2. Total renewable electricity (RES-E) capacity and energy for the 21 countries

The table that follows shows the breakdown of the renewable electricity technologies into subcategories (where applicable):

		2005	2010	2015	2020	[%] ^a	[%] ^b	Page
Hydropower < 1MW	[GW]	2.6	2.7	2.9	3.1			42
	[TWh]	10.8	10.3	10.9	11.6			45
	[Mtoe]	0.9	0.9	0.9	1.0	1.0	0.5	-
Hydropower 1MW – 10 MW	[GW]	8.9	9.4	10.6	11.8			42
	[TWh]	32.9	32.9	35.0	38.4			45
	[Mtoe]	2.8	2.8	3.0	3.3	3.4	1.5	-
Hydropower >10MW	[GW]	92.9	93.4	98.8	106.2			42
	[TWh]	287.6	282.7	288.3	296.2			45
	[Mtoe]	24.7	24.3	24.8	25.5	26.0	11.7	-
Pumped storage hydropower	[GW]	18.7	23.4	27.3	34.5			42
	[TWh]	23.5	22.9	27.0	31.9			45
	[Mtoe]	2.0	2.0	2.3	2.7	n.a.	n.a.	-
Hydropower (subtotal excluding pumped storage)	[GW]	110.9	113.7	121.2	130.8			42
	[TWh]	336.5	335.1	344.4	358.0			45
	[Mtoe]	28.9	28.8	29.6	30.8	31.4	14.1	-
Geothermal	[GW]	0.7	0.8	1.0	1.5			50
	[TWh]	5.5	6.0	7.3	10.4			52
	[Mtoe]	0.5	0.5	0.6	0.9	0.9	0.4	-
Solar photovoltaic	[GW]	2.2	25.1	53.5	82.7			60
	[TWh]	1.5	19.8	50.9	81.8			63
	[Mtoe]	0.1	1.7	4.4	7.0	7.2	3.2	-
Concentrated solar power	[GW]	0.0	0.6	3.6	7.0			60
	[TWh]	0.0	1.2	9.0	20.0			63
	[Mtoe]	0.0	0.1	0.8	1.7	1.8	0.8	-
Solar (subtotal)	[GW]	2.2	25.7	57.1	89.7			60
	[TWh]	1.5	21.0	60.0	101.8			63
	[Mtoe]	0.1	1.8	5.2	8.8	8.9	4.0	-
Tidal, wave and ocean energy	[GW]	0.2	0.2	0.4	2.1			68
	[TWh]	0.5	0.5	0.9	6.0			70
	[Mtoe]	0.0	0.0	0.1	0.5	0.5	0.2	-
Onshore wind	[GW]	39.4	79.9	121.0	157.3			78
	[TWh]	66.3	151.3	244.5	326.9			81
	[Mtoe]	5.7	13.0	21.0	28.1	28.7	12.9	-
Offshore wind	[GW]	0.7	2.5	14.3	40.4			78
	[TWh]	1.9	8.5	45.9	131.3			81
	[Mtoe]	0.2	0.7	3.9	11.3	11.5	5.2	-
Wind power (subtotal)	[GW]	40.1	82.6	136.0	200.2			78
	[TWh]	69.8	160.2	291.9	464.3			81
	[Mtoe]	6.0	13.8	25.1	39.9	40.7	18.3	-
Solid biomass	[GW]	10.0	13.1	17.9	23.1			88
	[TWh]	52.2	66.1	96.6	130.9			91
	[Mtoe]	4.5	5.7	8.3	11.3	11.5	5.2	-
Biogas	[GW]	2.6	5.2	7.2	9.5			88
	[TWh]	12.1	27.8	40.9	56.4			91
	[Mtoe]	1.0	2.4	3.5	4.9	4.9	2.2	-
Bioliquids	[GW]	0.4	1.0	1.4	1.7			88
	[TWh]	1.4	8.6	10.9	12.7			91
	[Mtoe]	0.1	0.7	0.9	1.1	1.1	0.5	-
Biomass (subtotal)	[GW]	15.0	21.0	28.5	36.8			88
	[TWh]	65.6	102.4	148.4	200.0			91
	[Mtoe]	5.6	8.8	12.8	17.2	17.5	7.9	-
Total renewable electricity	[TWh]	479.4	625.1	852.8	1140.6			-
	[Mtoe]	41.2	53.8	73.3	98.1	100.0	45.0	-

a: The percentage refers to the share of the individual technologies in total renewable electricity in the year 2020.

b: The percentage refers to the share of the individual technologies in total renewable energy (electricity, heating and cooling and transport) in the year 2020.

Be noted that these growth rates are average values, and that the conventional renewable technologies (hydropower electricity, solid biomass heating) constitute a large part of the renewable energy stock.

2.3. Total renewable energy sources' (RES) growth rates for the 21 countries

		2005 – 2010 [%/year]	2010 – 2015 [%/year]	2015 – 2020 [%/year]
Hydropower < 1MW	Capacity	0.6	1.7	1.5
	Energy	-0.8	1.0	1.3
Hydropower 1MW – 10 MW	Capacity	1.0	2.4	2.2
	Energy	0.0	1.3	1.9
Hydropower >10MW	Capacity	0.1	1.1	1.5
	Energy	-0.3	0.4	0.5
Pumped storage hydropower	Capacity	4.6	3.1	4.8
	Energy	-0.5	3.4	3.4
Hydropower (subtotal excluding pumped storage)	Capacity	0.5	1.3	1.5
	Energy	-0.1	0.5	0.8
Geothermal	Capacity	1.9	4.8	8.4
	Energy	1.8	4.0	7.4
Solar photovoltaic	Capacity	62.4	16.3	9.1
	Energy	68.2	20.8	10.0
Concentrated solar power	Capacity	n.a.	41.2	14.5
	Energy	n.a.	51.0	17.2
Solar (subtotal)	Capacity	63.3	17.3	9.5
	Energy	70.2	23.4	11.2
Tidal, wave and ocean energy	Capacity	0.4	8.7	41.7
	Energy	-1.3	11.5	47.3
Onshore wind	Capacity	15.2	8.7	5.4
	Energy	17.9	10.1	6.0
Offshore wind	Capacity	30.0	41.3	23.0
	Energy	34.7	40.1	23.4
Wind power (subtotal)	Capacity	15.6	10.5	8.1
	Energy	18.1	12.8	9.7
Solid biomass	Capacity	5.6	6.4	5.2
	Energy	4.8	7.9	6.3
Biogas	Capacity	14.9	6.9	5.7
	Energy	18.1	8.0	6.7
Bioliquids	Capacity	23.6	6.8	3.5
	Energy	43.1	4.9	3.1
Biomass (subtotal)	Capacity	6.9	6.3	5.3
	Energy	9.3	7.7	6.2
Average renewable electricity	Energy	5.5	6.4	6.0

The table above shows calculated growth rates. For new renewables such as wind power, solar PV and tidal, wave and ocean energy double-digit growth rates occur in the period to come.

It is interesting to note that the growth rates decline over time: for most technologies the average annual growth rate is higher for the period 2010-2015 than for 2015-2020.