

bp Energy Outlook 2050: September 2020

This workbook contains information presented in the 2020 edition of the bp Energy Outlook 2050 which can be found on the internet at: <http://www.bp.com/energyoutlook>

These summary data tables are sourced from the **Business-as-usual** , **Rapid** and **Net Zero** scenarios

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Primary Energy Consumption*

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018 CAGR (%)
North America	104	114	116	113	114	117	0.5%
United States	87	95	96	93	92	95	0.4%
S. & Cent. America	17	20	22	26	29	29	2.2%
Brazil	7	8	9	11	12	12	2.6%
Europe	84	88	91	89	83	85	0.0%
EU	71	74	77	74	69	70	-0.1%
CIS	34	32	34	35	36	39	0.6%
Russia	28	26	27	28	28	30	0.4%
Middle East	15	17	23	30	35	38	4.2%
Africa	10	11	14	16	18	19	2.8%
Asia Pacific	97	113	156	197	228	249	4.2%
China	37	42	76	104	125	136	5.8%
India	11	13	17	23	29	34	5.2%
Other Asia	17	21	27	32	37	41	4.0%
World	361	395	457	506	543	576	2.0%
of which: Developed	220	237	246	241	234	240	0.4%
Emerging	141	158	212	266	309	335	3.8%

Rapid scenario							
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)	
112	105	97	92	88	85	-1.0%	
90	84	77	73	70	67	-1.1%	
30	34	36	38	40	42	1.1%	
13	15	16	17	19	20	1.5%	
81	77	74	72	69	66	-0.8%	
65	61	57	55	52	49	-1.1%	
40	40	40	39	38	38	-0.1%	
30	30	29	28	27	27	-0.4%	
39	42	43	43	42	40	0.2%	
22	26	30	33	38	43	2.6%	
282	297	304	309	311	311	0.7%	
152	155	153	150	146	141	0.1%	
44	53	60	65	70	75	2.5%	
49	54	58	61	64	66	1.5%	
606	620	623	626	627	625	0.3%	
230	217	204	196	187	179	-0.9%	
376	403	419	430	440	445	0.9%	

Net Zero scenario							
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)	
113	106	97	92	89	88	-0.9%	
92	85	78	74	71	69	-1.0%	
30	33	35	37	39	41	1.1%	
13	15	16	17	18	20	1.5%	
81	76	73	72	70	67	-0.7%	
65	60	57	55	52	49	-1.1%	
41	41	41	41	41	42	0.2%	
31	31	30	29	29	28	-0.2%	
39	42	42	40	36	31	-0.6%	
22	26	29	32	36	40	2.3%	
284	297	301	308	312	316	0.7%	
152	155	151	149	144	139	0.1%	
44	53	59	65	71	77	2.6%	
49	54	57	62	65	68	1.6%	
611	622	618	624	624	625	0.3%	
232	218	205	197	190	186	-0.8%	
379	404	414	427	433	438	0.8%	

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)	
117	117	116	116	116	116	0.0%	
95	94	93	93	92	92	-0.1%	
31	35	38	41	44	47	1.5%	
13	15	16	18	19	20	1.6%	
82	80	77	74	72	70	-0.6%	
66	63	60	58	55	53	-0.8%	
40	42	43	43	43	44	0.4%	
31	31	31	30	30	30	0.0%	
40	44	47	50	52	53	1.1%	
22	26	30	34	40	47	2.8%	
285	306	322	333	342	349	1.1%	
153	159	162	161	159	155	0.4%	
44	54	63	71	78	86	3.0%	
50	56	61	66	71	76	2.0%	
617	648	671	691	709	725	0.7%	
237	234	229	225	222	218	-0.3%	
380	414	443	466	487	507	1.3%	

*Energy consumption comprises commercially-traded fuels, including modern renewables used to generate electricity.

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Oil Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018		Rapid scenario							Net Zero scenario							Business-as-usual scenario						
							CAGR (%)		2025	2030	2035	2040	2045	2050	2018-2050	2025	2030	2035	2040	2045	2050	2018-2050	2025	2030	2035	2040	2045	2050	2018-2050
North America	41	46	49	44	44	44	0.3%		41	37	31	24	18	14	-3.6%	41	36	28	18	11	7	-5.8%	43	40	38	35	33	31	-1.1%
United States	35	38	40	36	36	37	0.2%		34	30	25	20	15	11	-3.6%	34	29	23	14	9	6	-5.7%	35	33	31	29	27	25	-1.1%
S. & Cent. America	9	10	10	12	13	12	1.5%		11	11	11	9	8	7	-1.8%	11	11	10	7	5	3	-4.3%	12	12	13	13	13	13	0.3%
Brazil	3	4	4	5	5	5	1.8%		4	5	4	4	3	3	-1.6%	4	4	4	3	2	1	-4.0%	5	5	5	6	6	6	0.5%
Europe	33	34	35	32	29	30	-0.4%		26	22	17	12	9	7	-4.6%	26	21	14	8	5	3	-6.9%	28	26	23	19	17	15	-2.1%
EU	29	30	31	28	26	26	-0.5%		23	19	14	10	7	5	-4.9%	22	18	12	7	4	2	-7.2%	24	21	19	16	14	12	-2.4%
CIS	8	7	7	7	8	8	0.0%		9	9	8	7	6	5	-1.3%	9	9	8	6	4	3	-3.1%	9	9	10	10	10	9	0.5%
Russia	6	5	5	6	6	6	0.0%		7	6	6	5	5	4	-1.6%	7	6	6	4	3	2	-3.1%	7	7	7	7	7	7	0.1%
Middle East	9	10	13	15	17	17	2.7%		16	15	13	12	10	9	-2.0%	17	15	13	9	7	5	-3.7%	17	17	17	17	16	16	-0.3%
Africa	5	5	6	7	8	8	2.5%		9	9	9	9	8	7	-0.3%	9	9	9	7	5	4	-2.5%	8	9	10	11	12	13	1.5%
Asia Pacific	37	43	50	56	65	70	2.8%		72	70	65	56	48	41	-1.7%	71	67	56	41	28	18	-4.2%	75	77	77	76	75	74	0.2%
China	7	10	14	19	24	27	6.1%		27	26	23	20	16	13	-2.3%	27	25	21	15	10	7	-4.1%	28	28	27	26	24	23	-0.5%
India	3	5	5	7	8	10	5.0%		11	12	12	12	11	10	0.0%	11	11	10	8	5	4	-3.0%	11	13	15	16	17	19	2.0%
Other Asia	10	11	13	15	17	18	2.8%		20	20	19	17	15	13	-1.0%	19	19	16	13	9	6	-3.7%	20	21	22	23	23	24	0.8%
World	142	155	169	173	184	190	1.3%		184	173	153	129	108	89	-2.3%	183	168	137	96	65	42	-4.6%	191	190	187	182	177	172	-0.3%
of which: Developed	92	97	101	91	89	90	-0.1%		82	72	58	44	33	25	-3.9%	81	69	51	31	19	12	-6.2%	85	80	73	66	60	56	-1.5%
Emerging	50	57	68	82	95	100	3.0%		102	101	96	86	75	64	-1.4%	102	99	87	65	46	31	-3.6%	106	111	114	116	116	116	0.5%

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Oil Consumption

Million barrels per day	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	21	24	25	23	23	24	0.5%
United States	18	20	20	18	19	19	0.4%
S. & Cent. America	4	5	5	6	6	6	1.6%
Brazil	2	2	2	2	3	2	1.9%
Europe	16	16	17	15	14	15	-0.3%
EU	14	15	15	14	12	13	-0.4%
CIS	4	3	3	4	4	4	0.3%
Russia	3	3	3	3	3	3	0.2%
Middle East	5	5	6	8	9	9	3.0%
Africa	2	2	3	3	4	4	2.6%
Asia Pacific	18	21	25	28	32	36	3.0%
China	3	5	7	9	12	13	6.2%
India	2	2	3	3	4	5	5.3%
Other Asia	5	5	6	7	8	9	3.0%
World	70	77	84	87	93	97	1.4%
of which: Developed	46	49	50	46	45	46	0.0%
Emerging	24	28	34	41	48	51	3.3%

Rapid scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
22	20	17	13	10	8	CAGR (%)	
18	17	14	11	9	7	-3.3%	
6	6	5	5	4	3	-1.8%	
2	2	2	2	2	1	-1.6%	
13	11	8	6	4	3	-4.6%	
11	9	7	5	4	3	-4.9%	
4	5	4	4	3	3	-1.2%	
3	3	3	3	2	2	-1.4%	
9	8	7	7	6	6	-1.5%	
4	5	5	4	4	4	-0.3%	
36	36	33	29	25	21	-1.7%	
14	13	12	10	8	6	-2.3%	
6	6	6	6	6	5	0.1%	
10	10	9	9	8	7	-0.9%	

Net Zero scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
22	19	15	10	6	4	CAGR (%)	
18	16	13	8	5	3	-5.3%	
6	6	5	4	2	2	-4.1%	
2	2	2	2	1	1	-3.7%	
13	10	7	4	3	2	-6.8%	
11	9	6	3	2	1	-7.1%	
4	5	4	3	2	2	-2.7%	
3	3	3	2	2	1	-2.8%	
9	8	7	6	4	3	-3.1%	
4	4	4	4	3	2	-2.2%	
36	34	29	21	15	10	-3.9%	
14	13	11	8	5	4	-4.1%	
6	6	5	4	3	2	-2.4%	
10	9	8	7	5	3	-3.3%	

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
23	22	21	19	18	17	CAGR (%)	
19	18	17	16	15	14	-1.0%	
6	6	6	7	7	7	0.3%	
2	3	3	3	3	3	0.5%	
14	13	11	10	8	8	-2.1%	
12	11	9	8	7	6	-2.4%	
5	5	5	5	5	5	0.6%	
3	4	4	4	3	3	0.2%	
9	9	9	9	9	9	-0.1%	
4	5	5	6	6	7	1.6%	
38	39	39	39	38	38	0.2%	
14	14	14	13	12	11	-0.5%	
6	7	8	8	9	10	2.0%	
10	11	11	12	12	12	0.8%	

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Biofuels Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	0	0	1	1	2	2	15.3%
United States	0	0	0	1	1	2	14.8%
S. & Cent. America	0	0	0	1	1	1	6.3%
Brazil	0	0	0	1	1	1	5.5%
Europe	0	0	0	0	1	1	n/a
EU	0	0	0	0	1	1	n/a
CIS	0	0	0	0	0	0	n/a
Russia	0	0	0	0	0	0	n/a
Middle East	0	0	0	0	0	0	n/a
Africa	0	0	0	0	0	0	n/a
Asia Pacific	0	0	0	0	0	1	0.0%
China	0	0	0	0	0	0	0.0%
India	0	0	0	0	0	0	0.0%
Other Asia	0	0	0	0	0	0	0.0%
World	0	0	1	2	3	5	12.1%
of which: Developed	0	0	1	2	2	3	17.2%
Emerging	0	0	0	1	1	2	8.4%

Rapid scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
							CAGR (%)
3	3	4	3	3	3	0.6%	
2	3	3	3	2	2	0.3%	
1	2	2	1	1	1	0.4%	
1	1	1	1	1	1	-0.8%	
2	2	2	2	2	2	2.2%	
1	2	2	2	1	1	1.8%	
0	0	0	0	0	0	n/a	
0	0	0	0	0	0	n/a	
0	0	0	0	0	0	12.5%	
0	0	0	0	0	1	n/a	
2	3	4	4	4	3	5.1%	
1	1	1	1	1	1	4.5%	
0	0	0	0	0	0	6.6%	
1	1	1	1	1	1	4.8%	
8	10	12	11	11	10	2.3%	
5	6	6	6	5	5	1.4%	
3	4	5	6	5	5	3.5%	

Net Zero scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
							CAGR (%)
3	4	4	3	3	3	0.5%	
3	3	3	3	2	2	0.2%	
1	2	2	2	1	1	0.6%	
1	1	1	1	1	1	-1.5%	
2	2	2	2	2	2	2.7%	
1	2	2	2	2	2	2.3%	
0	0	0	0	0	0	n/a	
0	0	0	0	0	0	n/a	
0	0	1	1	1	1	15.1%	
0	0	1	1	1	1	n/a	
2	4	5	6	6	6	7.2%	
1	1	2	2	2	2	6.3%	
0	0	1	1	1	1	9.9%	
1	1	2	3	3	3	6.9%	
8	12	15	15	15	15	3.6%	
5	6	7	6	5	5	1.8%	
3	5	8	9	10	9	5.5%	

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
							CAGR (%)
2	2	2	2	2	2	0.4%	
2	2	2	2	2	2	0.2%	
1	1	2	2	2	2	1.4%	
1	1	1	1	1	1	1.3%	
1	1	1	1	1	1	0.4%	
1	1	1	1	1	1	-0.2%	
0	0	0	0	0	0	n/a	
0	0	0	0	0	0	n/a	
0	0	0	0	0	0	2.2%	
0	0	0	0	0	0	n/a	
1	1	2	2	2	2	3.5%	
0	0	0	0	0	0	1.6%	
0	0	0	0	0	0	6.3%	
1	1	1	1	1	1	3.8%	
6	6	7	7	7	7	1.3%	
3	4	4	4	4	4	0.4%	
2	3	3	3	4	4	2.4%	

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Biofuels Consumption

Million barrels per day	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	0	0	0	1	1	1	13.6%
United States	0	0	0	1	1	1	13.2%
S. & Cent. America	0	0	0	0	1	1	5.6%
Brazil	0	0	0	0	1	1	5.0%
Europe	0	0	0	0	0	0	n/a
EU	0	0	0	0	0	0	n/a
CIS	0	0	0	0	0	0	n/a
Russia	0	0	0	0	0	0	n/a
Middle East	0	0	0	0	0	0	n/a
Africa	0	0	0	0	0	0	n/a
Asia Pacific	0	0	0	0	0	0	n/a
China	0	0	0	0	0	0	n/a
India	0	0	0	0	0	0	n/a
Other Asia	0	0	0	0	0	0	n/a
World	0	0	1	2	2	3	10.4%
of which: Developed	0	0	0	1	2	2	15.3%
Emerging	0	0	0	0	1	1	7.2%

Rapid scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
1	2	2	2	1	1	CAGR (%)	0.4%
1	2	2	2	1	1		0.1%
1	1	1	1	1	1		-0.4%
1	1	1	1	1	0		-1.5%
1	1	1	1	1	1		2.2%
1	1	1	1	1	1		1.7%
0	0	0	0	0	0		n/a
0	0	0	0	0	0		n/a
0	0	0	0	0	0		10.0%
0	0	0	0	0	0		n/a
1	1	2	2	2	2		5.0%
0	0	1	1	1	0		4.4%
0	0	0	0	0	0		6.3%
0	1	1	1	1	1		4.8%
4	5	6	6	5	5		2.0%
2	3	3	3	3	2		1.3%
2	2	3	3	3	3		2.9%

Net Zero scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
1	2	2	2	1	1	CAGR (%)	0.3%
1	2	2	1	1	1		-0.1%
1	1	1	1	1	1		-0.5%
1	1	1	1	0	0		-2.8%
1	1	1	1	1	1		2.7%
1	1	1	1	1	1		2.2%
0	0	0	0	0	0		n/a
0	0	0	0	0	0		n/a
0	0	0	0	0	0		12.6%
0	0	0	0	0	0		n/a
1	2	2	3	3	3		6.5%
0	1	1	1	1	1		6.1%
0	0	0	0	0	0		7.9%
0	1	1	1	1	1		6.4%
4	6	7	7	7	6		2.8%
2	3	3	3	3	3		1.5%
2	3	4	4	4	4		4.2%

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
1	1	1	1	1	1	CAGR (%)	0.4%
1	1	1	1	1	1		0.2%
1	1	1	1	1	1		1.3%
1	1	1	1	1	1		1.2%
1	1	1	1	1	1		0.4%
0	1	0	0	0	0		-0.2%
0	0	0	0	0	0		n/a
0	0	0	0	0	0		n/a
0	0	0	0	0	0		0.0%
0	0	0	0	0	0		n/a
1	1	1	1	1	1		3.5%
0	0	0	0	0	0		1.7%
0	0	0	0	0	0		6.4%
0	0	0	0	1	1		4.0%
3	3	4	4	4	4		1.2%
2	2	2	2	2	2		0.4%
1	2	2	2	2	2		2.2%

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Gas* Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	25	27	26	29	34	37	1.6%
United States	22	23	21	23	27	29	1.4%
S. & Cent. America	3	4	5	5	6	6	3.4%
Brazil	0	0	1	1	2	1	8.7%
Europe	17	20	23	22	18	20	0.6%
EU	14	17	19	19	15	17	0.7%
CIS	16	16	18	19	19	21	1.1%
Russia	13	13	14	15	15	16	0.9%
Middle East	5	7	10	14	17	20	6.3%
Africa	2	2	3	4	5	5	5.3%
Asia Pacific	8	11	15	21	26	30	6.1%
China	1	1	2	4	7	10	12.8%
India	1	1	1	2	2	2	5.2%
Other Asia	3	5	7	8	9	10	5.2%
World	76	86	99	114	125	139	2.6%
of which: Developed	46	52	54	58	60	64	1.5%
Emerging	30	35	45	56	65	74	4.0%

*Gas includes natural gas and biomethane.

Rapid scenario							2018-2050
2025	2030	2035	2040	2045	2050		CAGR (%)
37	34	28	26	24	23		-1.5%
30	27	22	21	19	18		-1.6%
6	7	8	8	7	8		0.8%
2	2	2	2	3	3		2.6%
19	18	16	15	13	12		-1.5%
15	14	12	11	9	9		-2.1%
22	22	22	20	18	17		-0.6%
17	16	16	15	14	13		-0.8%
21	24	24	20	17	15		-0.8%
7	8	10	10	11	13		2.7%
43	51	58	59	55	54		1.9%
18	21	24	24	22	21		2.3%
4	7	10	11	12	13		5.8%
13	15	17	17	14	14		1.3%
155	165	166	158	145	142		0.1%
65	60	52	48	43	41		-1.4%
90	105	114	110	102	101		1.0%

Net Zero scenario							2018-2050
2025	2030	2035	2040	2045	2050		CAGR (%)
35	27	20	17	15	14		-2.9%
28	22	16	14	12	11		-3.0%
5	6	5	5	6	6		-0.1%
1	1	1	2	2	3		2.3%
17	15	13	11	9	8		-2.9%
14	12	10	8	6	5		-3.5%
22	21	18	14	11	9		-2.7%
17	16	14	10	8	7		-2.8%
21	22	17	11	8	6		-3.5%
6	7	7	6	6	6		0.5%
40	43	41	40	40	42		1.1%
17	19	19	19	20	19		2.0%
4	6	6	6	7	9		4.6%
12	12	11	10	9	10		0.0%
146	141	121	105	96	91		-1.3%
60	48	38	33	29	26		-2.8%
87	93	82	73	67	65		-0.4%

Business-as-usual scenario							2018-2050
2025	2030	2035	2040	2045	2050		CAGR (%)
39	40	42	43	43	44		0.6%
31	32	33	33	33	34		0.4%
7	7	8	9	9	10		1.6%
2	2	2	3	3	3		2.9%
20	20	19	19	18	18		-0.3%
16	16	15	15	14	13		-0.7%
22	22	23	23	23	23		0.3%
17	17	17	17	17	17		0.1%
21	24	26	26	27	26		0.9%
6	7	8	9	11	13		2.8%
40	47	51	54	55	57		2.0%
18	22	23	24	25	24		2.8%
3	4	6	7	8	9		4.7%
11	13	14	15	15	16		1.6%
155	168	177	183	187	191		1.0%
67	68	69	70	69	69		0.2%
88	99	107	113	118	122		1.6%

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Gas* Consumption

Billion cubic metres	1995	2000	2005	2010	2015	2018	1995-2018 CAGR (%)
North America	706	754	734	803	934	1022	1.6%
United States	598	628	595	648	744	817	1.4%
S. & Cent. America	77	98	126	144	175	168	3.4%
Brazil	5	10	20	28	43	36	8.7%
Europe	476	558	627	623	509	549	0.6%
EU	389	460	518	521	419	458	0.7%
CIS	456	452	501	531	530	581	1.1%
Russia	372	366	400	424	409	455	0.9%
Middle East	136	183	266	380	478	553	6.3%
Africa	46	56	82	99	128	150	5.3%
Asia Pacific	213	298	408	578	713	825	6.1%
China	18	25	47	109	195	283	12.8%
India	18	25	34	59	48	58	5.2%
Other Asia	83	126	186	227	259	267	5.2%
World	2111	2399	2745	3157	3466	3849	2.6%
of which: Developed	1276	1434	1503	1608	1654	1789	1.5%
Emerging	835	965	1241	1549	1812	2060	4.0%

*Gas includes natural gas and biomethane.

Rapid scenario						
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)
1036	945	784	717	663	632	-1.5%
835	754	623	576	526	495	-1.6%
174	200	211	211	208	215	0.8%
43	53	61	65	72	82	2.6%
529	498	453	412	364	337	-1.5%
424	387	342	304	261	236	-2.1%
610	614	606	556	508	479	-0.6%
467	457	447	409	378	355	-0.8%
585	667	668	566	479	426	-0.8%
181	232	268	283	298	348	2.7%
1192	1424	1622	1638	1515	1513	1.9%
490	585	672	665	614	583	2.3%
115	196	278	316	330	357	5.8%
356	420	476	466	395	402	1.3%
4307	4579	4613	4383	4035	3950	0.1%
1796	1666	1434	1320	1202	1141	-1.4%
2511	2913	3178	3063	2833	2809	1.0%

Net Zero scenario						
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)
968	761	563	476	420	392	-2.9%
777	606	446	376	328	304	-3.0%
152	156	148	152	156	165	-0.1%
35	39	41	50	62	75	2.3%
483	412	359	309	257	214	-2.9%
389	321	273	225	178	146	-3.5%
609	573	487	379	305	244	-2.7%
473	439	378	289	230	182	-2.8%
579	624	467	316	235	176	-3.5%
167	197	191	175	170	178	0.5%
1102	1193	1132	1121	1124	1157	1.1%
460	520	517	541	551	529	2.0%
110	157	170	180	196	243	4.6%
327	343	303	271	259	271	0.0%
4060	3916	3348	2928	2667	2527	-1.3%
1657	1345	1064	914	795	721	-2.8%
2404	2571	2284	2015	1873	1807	-0.4%

Business-as-usual scenario						
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)
1077	1123	1164	1190	1200	1228	0.6%
855	879	907	921	923	940	0.4%
183	206	227	246	262	278	1.6%
46	54	63	73	81	89	2.9%
559	545	539	534	513	495	-0.3%
457	439	427	416	392	371	-0.7%
606	611	626	626	631	634	0.3%
476	472	479	473	468	464	0.1%
597	678	717	730	739	729	0.9%
168	189	222	258	309	365	2.8%
1108	1303	1410	1486	1539	1575	2.0%
490	601	651	677	685	675	2.8%
88	123	156	187	219	254	4.7%
310	352	383	408	429	441	1.6%
4297	4655	4905	5071	5192	5305	1.0%
1856	1893	1924	1938	1918	1928	0.2%
2442	2762	2982	3133	3274	3376	1.6%

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Coal Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	21	24	25	22	17	14	-1.7%
United States	20	23	23	21	16	13	-1.8%
S. & Cent. America	1	1	1	1	2	2	2.7%
Brazil	1	1	1	1	1	1	1.3%
Europe	18	17	16	15	14	13	-1.5%
EU	15	13	13	12	11	9	-2.1%
CIS	6	5	5	5	5	6	-0.4%
Russia	5	4	4	4	4	4	-1.3%
Middle East	0	0	0	0	0	0	1.8%
Africa	3	3	4	4	4	4	1.1%
Asia Pacific	43	48	79	102	115	119	4.5%
China	28	30	55	73	80	80	4.7%
India	6	7	9	12	17	19	5.2%
Other Asia	3	4	5	7	8	10	5.8%
World	93	99	130	151	158	158	2.3%
of which: Developed	46	49	50	48	42	38	-0.9%
Emerging	47	50	80	103	116	120	4.2%

Rapid scenario						
2025	2030	2035	2040	2045	2050	2018-2050
6	3	1	1	0	0	CAGR (%)
6	2	1	0	0	0	-16.2%
						-17.3%
1	1	1	1	1	0	-5.1%
1	1	1	0	0	0	-3.3%
7	4	2	1	1	0	-12.8%
5	2	1	1	0	0	-12.7%
4	4	3	2	1	0	-7.8%
3	3	2	1	1	0	-7.6%
0	0	0	0	0	0	-4.7%
4	3	3	2	1	1	-5.0%
109	94	67	44	31	23	-5.1%
70	58	41	26	17	10	-6.3%
22	22	17	12	10	9	-2.2%
10	9	7	5	4	3	-3.4%
133	109	78	50	35	24	-5.7%
21	11	6	3	2	0	-12.7%
113	98	72	47	33	24	-4.9%

Net Zero scenario						
2025	2030	2035	2040	2045	2050	2018-2050
7	2	1	0	0	0	CAGR (%)
6	2	1	0	0	0	-17.5%
						-18.4%
2	1	1	1	0	0	-8.8%
1	1	1	0	0	0	-8.4%
8	4	2	1	0	0	-15.9%
5	2	1	1	0	0	-16.4%
5	5	4	1	1	0	-10.7%
4	3	2	1	0	0	-13.2%
0	0	0	0	0	0	-5.7%
4	3	2	1	1	0	-8.4%
110	90	50	30	18	11	-7.1%
70	57	31	17	9	5	-8.2%
21	18	10	7	5	4	-4.8%
11	10	6	4	2	2	-5.1%
136	106	60	34	20	12	-7.8%
22	11	5	3	1	1	-12.6%
114	95	55	31	18	11	-7.1%

Business-as-usual scenario						
2025	2030	2035	2040	2045	2050	2018-2050
10	8	6	5	4	3	CAGR (%)
10	7	6	4	4	3	-4.8%
						-5.0%
2	2	2	2	2	2	0.4%
1	1	1	1	1	1	-0.4%
10	7	6	5	4	3	-4.4%
7	4	3	3	2	2	-5.4%
5	5	5	4	4	4	-1.4%
3	3	2	2	2	1	-3.3%
1	1	1	1	1	1	4.1%
5	6	6	6	6	6	1.1%
123	121	120	115	110	105	-0.4%
76	69	63	57	50	44	-1.8%
25	29	32	33	34	35	1.9%
13	15	17	19	20	21	2.5%
155	149	145	138	131	123	-0.8%
29	23	19	16	13	11	-3.9%
126	126	126	122	118	113	-0.2%

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Nuclear Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	8	9	9	9	9	9	0.2%
United States	7	8	8	8	8	8	0.3%
S. & Cent. America	0	0	0	0	0	0	3.1%
Brazil	0	0	0	0	0	0	6.9%
Europe	10	10	11	10	9	8	-0.7%
EU	9	9	10	9	8	7	-0.8%
CIS	1	1	1	2	2	2	2.7%
Russia	1	1	1	2	2	2	2.7%
Middle East	0	0	0	0	0	0	n/a
Africa	0	0	0	0	0	0	-0.4%
Asia Pacific	4	5	5	5	4	5	0.8%
China	0	0	1	1	2	3	14.0%
India	0	0	0	0	0	0	6.6%
Other Asia	0	0	0	0	0	0	-0.2%
World	23	26	27	26	23	24	0.2%
of which: Developed	21	24	24	23	19	19	-0.6%
Emerging	2	2	3	3	4	6	5.1%

Rapid scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
8	8	7	6	6	6	CAGR (%)	
7	7	6	5	5	5	-1.2%	-1.1%
0	0	0	1	1	1	4.3%	
0	0	0	0	0	0	4.0%	
8	8	8	8	7	6	-1.1%	
7	7	7	7	6	5	-1.4%	
2	2	3	3	3	3	1.5%	
2	2	2	3	2	2	0.9%	
0	0	1	1	1	2	11.2%	
0	0	1	1	1	1	8.3%	
8	11	15	18	22	25	5.2%	
4	6	9	11	13	16	5.7%	
1	1	2	3	4	5	8.4%	
0	1	1	1	1	2	5.5%	
27	30	34	38	41	44	1.9%	
19	19	18	17	16	15	-0.7%	
8	11	16	21	25	29	5.3%	

Net Zero scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
8	8	7	7	8	9	CAGR (%)	
7	7	7	7	7	8	0.1%	0.1%
0	0	0	1	1	1	5.2%	
0	0	0	0	1	1	4.8%	
8	8	9	9	10	10	0.7%	
7	7	7	7	8	8	0.4%	
2	2	3	3	4	4	2.7%	
2	2	3	3	3	4	2.1%	
0	0	1	1	2	2	11.7%	
0	0	1	1	1	2	8.9%	
8	12	16	21	25	29	5.7%	
4	6	9	12	15	17	6.0%	
1	1	2	3	4	5	8.9%	
0	1	1	1	2	2	6.4%	
27	32	37	43	50	57	2.7%	
19	20	20	20	21	23	0.7%	
8	12	18	23	29	34	5.8%	

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
8	7	6	5	3	1	CAGR (%)	
7	7	5	4	3	1	-6.3%	-7.1%
0	0	0	1	1	1	3.3%	
0	0	0	0	0	0	3.3%	
7	7	5	4	4	4	-2.2%	
6	6	4	3	3	3	-2.7%	
2	2	2	3	3	3	1.0%	
2	2	2	2	2	2	0.5%	
0	0	1	1	1	2	11.0%	
0	0	0	1	1	1	7.0%	
8	10	13	15	18	20	4.4%	
4	6	8	10	12	14	5.4%	
1	1	1	2	2	3	6.7%	
0	0	0	1	1	1	2.7%	
26	27	28	29	30	31	0.7%	
18	17	14	11	10	7	-2.9%	
8	11	14	18	21	23	4.6%	

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Hydro Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	7	7	6	6	6	6	-0.3%
United States	3	3	3	2	2	3	-0.8%
S. & Cent. America	5	6	6	7	6	7	1.5%
Brazil	3	3	3	4	3	3	1.4%
Europe	6	6	6	6	6	6	0.1%
EU	3	4	3	4	3	3	-0.3%
CIS	2	2	2	2	2	2	0.0%
Russia	2	2	2	2	2	2	-0.2%
Middle East	0	0	0	0	0	0	-1.3%
Africa	1	1	1	1	1	1	3.0%
Asia Pacific	5	5	7	10	14	15	5.1%
China	2	2	4	7	10	11	7.8%
India	1	1	1	1	1	1	2.2%
Other Asia	1	1	1	1	2	2	3.9%
World	25	27	28	32	35	38	1.8%
of which: Developed	14	14	13	13	13	13	-0.1%
Emerging	11	12	15	19	22	24	3.4%

Rapid scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
6	7	7	7	7	7	CAGR (%)	
3	3	3	3	3	3	0.2%	0.0%
8	8	9	9	10	11	1.6%	
4	4	4	4	5	5	1.0%	
6	6	6	6	6	7	0.4%	
3	3	3	3	3	3	0.3%	
2	3	3	3	3	3	0.7%	
2	2	2	2	2	2	0.1%	
0	0	0	0	0	0	1.1%	
2	3	3	3	4	4	3.7%	
19	21	22	24	25	26	1.6%	
12	13	14	15	16	16	1.3%	
2	2	2	2	3	3	2.4%	
3	4	5	5	5	6	3.0%	
43	47	50	53	55	57	1.3%	
14	14	14	14	14	15	0.3%	
30	33	36	38	40	42	1.7%	

Net Zero scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
7	7	7	7	7	8	CAGR (%)	
3	3	3	3	3	3	0.5%	0.5%
8	9	10	10	11	12	1.8%	
4	4	5	5	5	5	1.2%	
6	6	7	7	7	7	0.8%	
3	3	3	4	4	4	0.7%	
3	3	3	3	3	3	1.1%	
2	2	2	2	2	2	0.6%	
0	0	0	0	0	0	1.8%	
2	3	3	3	4	4	4.0%	
19	21	23	24	26	28	1.9%	
12	13	14	15	16	17	1.4%	
2	2	2	3	3	3	2.8%	
4	4	5	6	6	7	3.4%	
44	49	52	55	59	62	1.6%	
14	15	15	16	16	17	0.7%	
30	34	37	40	43	45	2.0%	

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
6	6	7	7	7	7	CAGR (%)	
3	3	3	2	2	2	0.1%	-0.2%
7	8	8	9	9	10	1.2%	
4	4	4	4	4	4	0.6%	
6	6	6	6	6	6	0.2%	
3	3	3	3	3	3	0.0%	
2	3	3	3	3	3	0.5%	
2	2	2	2	2	2	0.1%	
0	0	0	0	0	0	1.1%	
2	2	3	3	3	3	3.2%	
18	20	21	22	23	23	1.3%	
12	13	14	14	14	14	0.9%	
2	2	2	2	2	2	2.0%	
3	4	4	5	5	5	2.6%	
43	46	47	49	50	51	1.0%	
14	14	14	14	14	14	0.2%	
29	32	34	35	36	37	1.4%	

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Bioenergy Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	1	1	1	2	2	3	6.6%
United States	1	1	1	2	2	3	6.7%
S. & Cent. America	0	0	0	1	1	2	7.1%
Brazil	0	0	0	1	1	1	6.7%
Europe	0	0	1	2	2	3	11.4%
EU	0	0	1	2	2	3	11.4%
CIS	0	0	0	0	0	0	n/a
Russia	0	0	0	0	0	0	n/a
Middle East	0	0	0	0	0	0	n/a
Africa	0	0	0	0	0	0	4.9%
Asia Pacific	0	0	0	1	2	2	12.2%
China	0	0	0	0	1	1	16.9%
India	0	0	0	0	0	0	16.6%
Other Asia	0	0	0	0	0	1	n/a
World	1	2	3	5	8	10	8.7%
of which: Developed	1	1	2	4	5	6	8.1%
Emerging	0	0	1	2	3	4	10.1%

Rapid scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
4	6	7	7	8	8		3.2%
4	5	6	6	6	6		2.4%
2	3	3	4	4	4		2.4%
2	2	2	2	3	3		1.9%
4	5	6	6	6	6		2.6%
4	5	5	5	5	5		2.3%
0	0	0	0	1	1		n/a
0	0	0	0	0	0		n/a
0	0	1	1	1	1		12.2%
0	1	1	1	2	2		14.2%
7	11	15	18	20	21		7.0%
4	6	7	9	9	9		7.0%
1	2	3	4	5	5		8.9%
1	2	3	4	5	5		7.3%
19	26	33	37	41	42		4.7%
10	12	14	15	15	16		3.0%
9	14	18	22	25	27		6.4%

Net Zero scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
5	7	9	9	9	9		3.8%
4	6	7	7	7	7		3.0%
3	3	4	5	5	5		3.3%
2	2	3	3	3	3		2.1%
5	6	7	7	7	7		3.0%
5	6	6	6	6	6		2.5%
0	0	1	1	2	2		n/a
0	0	0	1	1	1		n/a
0	1	1	1	1	1		14.4%
0	1	2	2	3	4		16.1%
8	14	22	25	26	27		7.8%
4	7	9	10	11	10		7.4%
2	3	5	6	7	8		10.2%
1	3	5	6	7	7		8.5%
22	33	44	51	53	55		5.6%
11	15	18	18	18	18		3.5%
11	18	27	32	35	37		7.5%

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
3	4	4	4	4	4		1.4%
3	3	3	4	4	4		1.2%
2	2	3	3	3	3		1.9%
2	2	2	2	2	2		1.7%
3	4	4	5	5	5		1.7%
3	4	4	4	4	4		1.5%
0	0	0	0	0	0		n/a
0	0	0	0	0	0		n/a
0	0	0	0	0	0		5.5%
0	0	0	0	0	0		6.9%
4	5	6	7	8	9		4.3%
2	3	3	4	4	4		4.4%
1	1	1	1	2	2		6.2%
1	1	1	1	2	2		3.7%
13	15	17	19	21	22		2.6%
7	8	9	10	10	10		1.6%
5	7	8	10	11	12		3.7%

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Solar Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018 CAGR (%)
North America	0	0	0	0	0	1	21.7%
United States	0	0	0	0	0	1	21.7%
S. & Cent. America	0	0	0	0	0	0	n/a
Brazil	0	0	0	0	0	0	n/a
Europe	0	0	0	0	1	1	n/a
EU	0	0	0	0	1	1	n/a
CIS	0	0	0	0	0	0	n/a
Russia	0	0	0	0	0	0	n/a
Middle East	0	0	0	0	0	0	n/a
Africa	0	0	0	0	0	0	n/a
Asia Pacific	0	0	0	0	1	3	n/a
China	0	0	0	0	0	2	n/a
India	0	0	0	0	0	0	n/a
Other Asia	0	0	0	0	0	0	n/a
World	0	0	0	0	2	5	31.3%
of which: Developed	0	0	0	0	2	3	28.1%
Emerging	0	0	0	0	1	2	n/a

Rapid scenario							2018-2050 CAGR (%)
2025	2030	2035	2040	2045	2050		
3	4	7	10	12	14		8.8%
2	4	6	9	10	12		8.4%
0	1	1	3	4	5		12.8%
0	0	1	1	2	3		15.0%
3	5	7	9	11	12		7.3%
3	4	6	7	9	9		6.8%
0	0	1	1	2	3		19.4%
0	0	0	1	1	1		16.9%
0	1	3	5	7	8		17.0%
0	1	2	4	6	9		15.7%
10	18	30	44	55	60		10.1%
7	11	16	23	28	30		9.6%
1	3	7	11	14	17		13.8%
0	1	2	4	7	7		13.9%
17	30	50	76	97	110		10.0%
8	12	18	24	29	32		7.7%
9	18	32	52	68	78		11.8%

Net Zero scenario							2018-2050 CAGR (%)
2025	2030	2035	2040	2045	2050		
4	7	11	17	19	21		10.3%
3	7	10	15	17	18		9.9%
0	1	2	4	6	7		13.9%
0	0	1	2	2	3		15.8%
4	6	9	13	14	14		7.9%
3	5	7	10	11	11		7.2%
0	0	2	5	6	8		23.0%
0	0	1	3	4	4		20.5%
0	2	7	11	11	9		17.8%
0	1	3	6	9	12		17.0%
12	25	48	67	78	83		11.2%
7	13	25	33	35	36		10.2%
2	5	12	18	23	26		15.4%
1	2	5	9	11	12		15.9%
20	42	82	122	144	155		11.2%
9	17	27	37	42	45		8.8%
11	25	55	84	101	110		13.0%

Business-as-usual scenario							2018-2050 CAGR (%)
2025	2030	2035	2040	2045	2050		
2	4	5	7	10	12		8.3%
2	3	5	7	9	11		8.2%
0	1	1	2	2	3		10.8%
0	0	0	1	1	1		12.1%
2	3	4	5	5	5		4.7%
2	3	3	4	4	4		4.1%
0	0	0	0	0	1		13.6%
0	0	0	0	0	0		10.8%
0	1	1	2	3	4		14.9%
0	1	1	2	3	4		13.2%
7	12	16	21	25	29		7.6%
5	8	10	12	13	13		6.8%
1	2	3	5	7	9		11.5%
0	0	1	1	2	3		11.4%
12	21	28	39	48	59		7.8%
6	8	11	15	18	21		6.3%
7	12	17	24	30	37		9.2%

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Wind Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018 CAGR (%)
North America	0	0	0	1	2	3	21.9%
United States	0	0	0	1	2	2	21.2%
S. & Cent. America	0	0	0	0	0	1	n/a
Brazil	0	0	0	0	0	0	n/a
Europe	0	0	1	1	3	4	21.6%
EU	0	0	1	1	3	3	21.3%
CIS	0	0	0	0	0	0	n/a
Russia	0	0	0	0	0	0	n/a
Middle East	0	0	0	0	0	0	n/a
Africa	0	0	0	0	0	0	n/a
Asia Pacific	0	0	0	1	2	4	29.9%
China	0	0	0	0	2	3	28.6%
India	0	0	0	0	0	1	n/a
Other Asia	0	0	0	0	0	0	n/a
World	0	0	1	3	8	11	24.0%
of which: Developed	0	0	1	3	5	7	22.0%
Emerging	0	0	0	1	2	5	30.6%

Rapid scenario						
2025	2030	2035	2040	2045	2050	2018-2050
6	8	11	13	15	17	CAGR (%)
5	6	9	11	12	13	5.6%
						5.4%
1	2	3	4	5	7	7.9%
1	1	2	2	3	4	7.2%
7	9	12	15	16	17	5.0%
6	8	10	12	13	14	4.4%
0	0	1	3	4	5	21.7%
0	0	1	2	3	3	n/a
0	0	2	4	5	5	21.7%
0	1	2	3	5	6	12.8%
13	21	32	46	57	63	8.9%
10	14	19	24	27	29	7.0%
2	4	7	11	13	15	10.9%
0	1	3	7	11	14	18.6%
28	41	62	87	107	121	7.7%
14	18	26	32	36	39	5.7%
14	23	36	55	71	81	9.4%

Net Zero scenario						
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)
8	12	15	18	21	23	6.7%
6	10	12	15	17	19	6.5%
1	2	3	5	7	8	8.5%
1	1	2	3	4	5	7.7%
8	10	14	17	18	18	5.2%
7	9	11	14	14	14	4.5%
0	1	3	8	11	12	24.9%
0	0	2	5	7	8	n/a
0	1	3	6	6	6	22.2%
1	1	2	4	6	8	13.6%
15	26	45	60	71	79	9.7%
11	15	24	28	30	31	7.2%
3	6	11	15	18	20	11.9%
0	2	6	12	17	21	20.1%
32	53	85	119	140	155	8.5%
16	24	32	41	46	49	6.4%
16	29	53	78	94	106	10.3%

Business-as-usual scenario						
2025	2030	2035	2040	2045	2050	2018-2050
5	7	9	10	12	14	CAGR (%)
4	6	8	9	11	12	5.1%
						5.2%
1	2	2	3	4	5	7.0%
1	1	1	2	2	3	6.1%
6	8	10	12	13	14	4.3%
5	7	9	11	12	12	4.1%
0	0	1	1	2	2	18.2%
0	0	0	0	1	1	n/a
0	0	1	2	3	4	20.4%
0	1	1	2	4	5	12.4%
10	15	18	23	28	33	6.7%
8	11	13	15	17	19	5.6%
1	2	3	4	6	8	8.8%
0	0	1	1	2	4	13.8%
22	33	42	54	65	78	6.2%
12	16	20	25	28	31	4.9%
11	17	22	29	38	47	7.5%

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Renewables^ Consumption

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018 CAGR (%)
North America	1	1	2	3	5	7	9.3%
United States	1	1	1	3	4	6	9.5%
S. & Cent. America	0	0	0	1	2	2	8.6%
Brazil	0	0	0	1	1	2	8.0%
Europe	0	1	2	3	6	8	15.2%
EU	0	1	1	3	6	7	15.0%
CIS	0	0	0	0	0	0	n/a
Russia	0	0	0	0	0	0	n/a
Middle East	0	0	0	0	0	0	n/a
Africa	0	0	0	0	0	0	n/a
Asia Pacific	0	0	1	2	5	10	16.0%
China	0	0	0	1	3	6	24.3%
India	0	0	0	0	1	1	22.9%
Other Asia	0	0	0	0	1	1	10.5%
World	2	3	4	10	18	27	12.3%
of which: Developed	1	2	3	7	12	16	11.3%
Emerging	1	1	1	2	6	11	14.1%

^ Renewables include wind, solar, geothermal, biomass, biofuels and biomethane.

Rapid scenario							2018-2050 CAGR (%)
2025	2030	2035	2040	2045	2050		
13	18	25	30	35	38		5.5%
11	15	21	25	29	31		5.2%
4	5	8	11	13	16		6.0%
3	4	5	6	8	9		5.1%
15	20	25	31	34	36		4.9%
13	17	21	25	27	28		4.4%
0	1	2	4	7	9		21.1%
0	0	1	3	4	5		21.7%
1	2	5	10	13	14		17.5%
1	2	5	8	13	18		13.7%
31	51	78	110	134	146		8.9%
21	31	43	56	64	68		7.9%
4	9	17	26	32	37		11.4%
2	5	9	17	24	27		11.4%
65	99	147	204	249	277		7.5%
31	44	59	72	82	88		5.4%
33	56	88	132	167	189		9.4%

Net Zero scenario							2018-2050 CAGR (%)
2025	2030	2035	2040	2045	2050		
17	27	35	44	50	54		6.7%
14	23	30	37	41	44		6.4%
4	7	10	14	17	20		6.8%
3	4	5	7	9	11		5.6%
17	23	30	38	40	40		5.3%
15	19	25	31	32	31		4.6%
0	2	6	14	19	22		24.5%
0	1	4	9	12	14		25.3%
1	3	11	18	19	17		18.2%
1	3	7	13	19	24		14.8%
36	66	116	155	178	192		9.8%
23	35	58	71	76	77		8.3%
6	15	28	39	47	54		12.8%
3	8	18	29	37	42		12.9%
76	130	215	296	342	370		8.5%
37	57	77	98	107	113		6.2%
39	73	138	198	235	257		10.4%

Business-as-usual scenario							2018-2050 CAGR (%)
2025	2030	2035	2040	2045	2050		
11	14	18	22	27	31		4.8%
9	13	16	20	24	27		4.8%
3	5	6	8	10	11		4.9%
2	3	4	5	6	6		3.9%
12	15	18	22	23	24		3.6%
11	14	16	19	20	21		3.3%
0	0	1	1	2	3		16.8%
0	0	0	1	1	1		16.2%
0	1	2	4	6	8		15.5%
1	1	3	5	7	10		11.8%
21	32	41	52	62	73		6.5%
15	22	26	31	34	36		5.8%
2	5	7	11	15	19		9.2%
1	2	3	5	7	10		7.7%
48	70	89	114	137	161		5.7%
25	33	41	50	57	63		4.3%
23	37	48	64	80	98		7.1%

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Oil Production

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	27	27	27	27	38	43	2.0%
United States	16	15	13	14	24	28	2.5%
S. & Cent. America	13	14	16	16	17	14	0.5%
Brazil	2	3	4	5	6	6	5.9%
Europe	13	14	11	8	7	7	-2.8%
EU	7	7	5	4	3	3	-3.6%
CIS	15	16	24	28	29	30	3.1%
Russia	13	14	20	21	23	24	2.6%
Middle East	41	47	51	51	60	63	1.9%
Africa	14	16	20	21	17	17	0.7%
Asia Pacific	15	16	16	17	17	16	0.2%
China	6	7	8	9	9	8	1.2%
India	2	1	1	2	2	2	0.4%
Other Asia	6	6	6	6	5	5	-0.7%
World	138	151	165	167	184	189	1.4%
of which: Developed	41	43	39	36	46	51	0.9%
Emerging	96	108	126	131	138	138	1.6%

Rapid scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
46	48	43	30	22	17	-2.8%
30	32	29	23	18	14	-2.1%
15	17	15	13	8	6	-2.8%
8	9	9	8	5	3	-1.9%
7	6	4	2	1	1	-5.4%
3	3	2	1	1	1	-4.2%
30	30	28	24	19	16	-1.9%
24	24	23	20	17	14	-1.6%
56	46	41	42	44	40	-1.4%
14	12	9	7	5	3	-5.1%
13	11	10	8	6	3	-5.0%
8	6	6	6	4	2	-4.6%
1	1	1	0	0	0	-7.7%
3	3	2	2	1	1	-4.8%
181	170	150	126	106	87	-2.4%
54	55	48	33	24	19	-3.1%
128	115	102	93	82	69	-2.2%

Business-as-usual scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
47	51	50	45	39	34	-0.7%
31	34	33	29	25	22	-0.7%
16	18	18	18	16	15	0.2%
8	9	10	10	9	8	1.0%
7	6	5	3	3	3	-2.9%
3	3	2	2	2	2	-1.7%
31	31	31	31	30	29	-0.1%
25	25	25	24	24	23	0.0%
58	53	52	55	60	63	0.0%
16	16	16	15	14	13	-0.7%
14	13	12	12	12	12	-1.0%
8	7	7	7	7	6	-1.0%
1	1	1	1	1	1	-0.9%
3	3	3	3	4	3	-1.0%
189	187	184	178	174	169	-0.3%
55	58	56	49	43	37	-0.9%
134	129	128	130	131	132	-0.2%

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Oil Production

Million barrels per day	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	15	15	15	15	21	24	2.1%
United States	9	9	8	9	14	16	2.6%
S. & Cent. America	6	7	7	8	8	7	0.5%
Brazil	1	1	2	2	3	3	5.8%
Europe	7	7	6	5	4	4	-2.5%
EU	4	4	3	2	2	2	-3.1%
CIS	7	8	12	13	14	15	3.1%
Russia	6	7	10	10	11	11	2.7%
Middle East	20	23	26	26	30	32	2.0%
Africa	7	8	10	10	8	8	0.7%
Asia Pacific	7	8	8	9	9	9	0.7%
China	3	3	4	4	5	4	1.6%
India	1	1	1	1	1	1	1.1%
Other Asia	3	3	3	3	3	3	-0.4%
World	69	76	84	86	94	98	1.5%
of which: Developed	22	23	21	20	25	28	1.0%
Emerging	47	53	62	65	69	70	1.7%

Rapid scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
25	27	24	17	13	10	-2.5%
18	19	17	14	11	9	-1.9%
7	8	7	6	4	3	-2.7%
4	4	4	4	2	1	-1.9%
4	3	2	1	1	1	-5.1%
2	1	1	1	1	1	-3.8%
15	15	14	12	10	8	-1.8%
12	12	11	10	8	7	-1.6%
29	24	22	22	23	21	-1.3%
7	6	5	4	3	2	-4.7%
7	7	6	5	3	2	-4.3%
4	3	3	3	2	1	-4.1%
1	1	1	0	0	0	-4.8%
2	2	1	1	1	1	-4.2%
94	89	79	67	57	47	-2.2%
30	31	27	19	14	11	-2.8%
65	59	53	49	43	36	-2.0%

Business-as-usual scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
26	28	28	25	22	19	-0.6%
18	20	19	17	15	14	-0.5%
8	8	9	8	8	7	0.2%
4	4	5	5	4	4	1.0%
4	4	3	2	2	2	-2.7%
2	2	1	1	1	1	-1.6%
15	15	15	15	15	14	0.0%
12	12	12	12	12	12	0.0%
30	27	27	29	31	33	0.1%
8	8	8	8	7	7	-0.6%
8	7	7	7	7	7	-0.6%
4	4	4	4	4	3	-0.7%
1	1	1	1	1	1	0.0%
2	2	2	2	2	2	-0.8%
98	98	97	94	92	89	-0.3%
31	32	31	28	24	21	-0.8%
68	65	65	67	67	68	-0.1%

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Natural gas* Production

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	25	26	26	28	34	38	1.9%
United States	18	19	18	21	27	30	2.2%
S. & Cent. America	3	4	5	6	6	6	3.6%
Brazil	0	0	0	1	1	1	7.0%
Europe	10	11	12	11	9	9	-0.2%
EU	8	9	8	7	5	4	-3.0%
CIS	22	23	26	26	27	30	1.2%
Russia	19	19	21	22	21	24	0.9%
Middle East	5	7	11	17	22	25	7.2%
Africa	3	5	6	7	7	9	4.4%
Asia Pacific	8	10	13	18	20	23	4.9%
China	1	1	2	3	5	6	10.0%
India	1	1	1	2	1	1	1.8%
Other Asia	5	7	9	10	11	11	3.6%
World	75	86	99	113	126	139	2.7%
of which: Developed	36	39	39	41	47	52	1.7%
Emerging	40	48	60	72	79	87	3.5%

*Natural gas does not include biomethane.

Rapid scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
43	43	41	37	34	32	-0.5%
35	35	33	30	28	28	-0.3%
7	6	6	6	6	6	-0.4%
1	2	2	2	2	1	0.9%
7	5	3	2	1	1	-7.7%
2	2	1	1	0	0	-10.8%
35	38	37	35	31	31	0.1%
27	29	29	28	24	24	0.0%
26	31	34	30	26	25	0.0%
11	14	16	16	16	18	2.3%
26	25	26	25	24	22	-0.1%
9	10	11	11	11	10	1.8%
2	2	2	2	2	3	3.2%
10	8	7	6	5	4	-3.3%
154	162	163	152	139	134	-0.1%
56	54	50	45	41	38	-1.0%
98	108	112	107	98	95	0.3%

Business-as-usual scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
43	47	50	51	52	53	1.0%
35	37	39	39	41	42	1.1%
7	7	7	7	8	8	0.5%
1	2	2	2	2	2	2.6%
7	6	4	3	2	1	-5.8%
2	2	1	1	0	0	-10.8%
34	37	40	42	41	42	1.1%
27	29	32	33	32	33	1.0%
26	31	34	35	36	37	1.3%
10	13	14	16	18	20	2.7%
26	25	27	27	28	27	0.5%
9	10	11	12	13	12	2.4%
2	2	2	2	3	3	4.0%
10	8	8	7	6	5	-2.3%
154	166	175	180	184	187	0.9%
56	59	60	59	59	60	0.4%
97	108	115	121	124	127	1.2%

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Natural gas* Production

Billion cubic metres	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	685	728	713	776	949	1058	1.9%
United States	503	519	489	575	740	836	2.2%
S. & Cent. America	78	102	139	160	178	176	3.6%
Brazil	5	8	11	15	24	25	7.1%
Europe	266	311	328	310	261	251	-0.2%
EU	221	245	222	183	125	109	-3.0%
CIS	625	644	722	733	745	831	1.2%
Russia	541	537	589	598	584	669	0.9%
Middle East	139	204	310	475	600	681	7.2%
Africa	87	135	171	202	204	236	4.4%
Asia Pacific	208	277	372	494	564	632	4.9%
China	18	27	50	97	136	162	10.0%
India	18	25	29	47	28	27	1.8%
Other Asia	136	185	248	288	316	305	3.6%
World	2088	2402	2755	3151	3501	3865	2.7%
of which: Developed	988	1079	1087	1149	1294	1447	1.7%
Emerging	1100	1323	1668	2002	2208	2418	3.5%

*Natural gas does not include biomethane.

Rapid scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
1187	1197	1133	1024	946	894	-0.5%
959	969	923	836	791	770	-0.3%
187	178	169	177	169	157	-0.4%
31	42	50	56	44	34	0.9%
203	147	94	61	35	19	-7.7%
65	45	25	14	6	3	-11.0%
975	1046	1032	982	857	849	0.1%
764	813	798	765	672	671	0.0%
719	866	930	836	732	685	0.0%
300	376	441	451	451	493	2.3%
721	699	722	698	658	618	-0.1%
241	271	300	308	306	285	1.8%
45	43	43	49	66	76	3.2%
269	226	204	168	136	105	-3.3%
4292	4509	4522	4229	3848	3717	-0.1%
1556	1503	1402	1258	1132	1066	-1.0%
2736	3006	3119	2971	2716	2651	0.3%

Business-as-usual scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
1200	1312	1384	1407	1433	1470	1.0%
966	1038	1088	1097	1133	1178	1.1%
186	182	188	201	211	209	0.5%
32	44	58	67	61	57	2.6%
203	166	108	74	53	37	-5.8%
65	45	25	14	6	3	-11.0%
948	1024	1099	1156	1140	1172	1.1%
748	810	877	920	896	917	1.0%
728	874	931	979	1008	1014	1.3%
285	356	401	445	486	552	2.7%
715	705	737	742	773	745	0.5%
241	273	305	325	355	345	2.4%
47	49	53	62	82	96	4.0%
269	230	212	192	176	147	-2.3%
4264	4619	4848	5003	5105	5200	0.9%
1560	1631	1658	1644	1647	1664	0.4%
2704	2988	3190	3359	3458	3535	1.2%

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Coal Production

Exajoules	1995	2000	2005	2010	2015	2018	1995-2018
							CAGR (%)
North America	24	25	25	24	20	17	-1.6%
United States	22	23	23	22	18	15	-1.6%
S. & Cent. America	1	1	2	2	3	3	4.1%
Brazil	0	0	0	0	0	0	0.5%
Europe	14	12	11	10	8	7	-2.9%
EU	12	9	8	7	6	5	-3.4%
CIS	7	7	7	8	10	12	2.3%
Russia	5	5	6	6	8	9	2.5%
Middle East	0	0	0	0	0	0	0.0%
Africa	5	5	6	6	6	7	1.3%
Asia Pacific	43	47	75	100	115	120	4.6%
China	28	30	52	70	76	77	4.4%
India	6	6	8	11	12	13	3.7%
Other Asia	2	3	6	9	14	17	9.0%
World	94	96	126	151	162	165	2.5%
of which: Developed	45	44	45	44	40	37	-0.8%
Emerging	49	53	81	107	121	128	4.2%

Rapid scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
7	3	1	0	0	0	-15.7%
6	2	1	0	0	0	-17.0%
2	1	1	1	1	1	-2.4%
0	0	0	0	0	0	-3.7%
4	2	2	1	1	1	-5.4%
2	1	1	0	0	0	-14.2%
8	8	6	4	3	2	-5.1%
6	6	4	3	2	1	-6.7%
0	0	0	0	0	0	0.9%
5	5	4	4	3	3	-2.6%
107	94	67	43	30	22	-5.2%
64	56	38	22	14	8	-6.8%
17	14	11	8	6	6	-2.5%
17	16	12	7	6	5	-4.1%
133	113	81	54	40	29	-5.2%
21	13	10	7	6	5	-6.1%
112	100	72	46	34	25	-5.0%

Business-as-usual scenario						
2025	2030	2035	2040	2045	2050	2018-2050
						CAGR (%)
15	13	11	8	7	5	-3.7%
14	12	10	7	6	5	-3.7%
2	2	2	2	2	2	-0.9%
0	0	0	0	0	0	-2.8%
5	4	3	2	1	1	-5.4%
4	2	1	1	0	0	-7.6%
13	14	16	17	12	9	-0.9%
11	12	14	15	10	6	-1.2%
0	0	0	0	0	0	1.6%
6	6	6	6	5	3	-2.6%
116	112	108	103	102	100	-0.6%
68	57	51	46	41	35	-2.4%
18	21	22	21	26	27	2.4%
19	21	23	24	24	27	1.3%
156	150	146	138	129	120	-1.0%
32	29	25	21	19	18	-2.3%
124	122	120	117	109	102	-0.7%

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World

EJ	1995	2000	2005	2010	2015	2018	1995-2018
Fuels into							CAGR (%)
Power*							
Fuels							
Oil	12	12	11	10	10	8	-1.8%
Gas	22	27	35	43	49	54	3.9%
Coal	54	63	81	91	96	99	2.7%
Nuclear	23	26	27	26	23	24	0.2%
Hydro	25	27	28	32	35	38	1.8%
Wind	0	0	1	3	8	11	24.0%
Solar	0	0	0	0	2	5	31.3%
Biomass	1	1	2	3	4	5	6.8%
Geothermal	0	1	1	1	1	1	3.1%

Hydrogen produced							
Fuels							
Grey	0	0	0	0	0	0	n/a
Blue	0	0	0	0	0	0	n/a
Green	0	0	0	0	0	0	n/a

*Power includes green hydrogen production.

TWh	1995	2000	2005	2010	2015	2018	1995-2018
Generation from							CAGR (%)
Power							
Fuels							
Oil	1267	1237	1164	942	1032	803	-2.0%
Gas	2012	2762	3751	4871	5598	6183	5.0%
Coal	5035	5985	7361	8659	9412	10101	3.1%
Nuclear	2322	2581	2772	2771	2577	2701	0.7%
Hydro	2489	2655	2919	3438	3887	4192	2.3%
Biomass	107	133	198	313	458	538	7.3%
Geothermal	39	52	57	67	79	88	3.6%
Wind	8	31	104	342	832	1270	24.5%
Solar	1	1	4	34	261	584	34.5%

Rapid scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
6	4	3	2	2	1		-5.4%
67	73	73	65	54	53		-0.1%
79	62	40	21	15	13		-6.1%
27	30	34	38	41	44		1.9%
43	47	50	53	55	57		1.3%
28	42	62	87	107	121		7.7%
17	30	50	76	97	110		10.0%
9	12	15	18	20	20		4.6%
1	2	2	3	4	4		5.4%

0	1	2	2	2	1		n/a
0	0	1	4	7	11		n/a
0	0	1	4	8	13		n/a

Rapid scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
589	404	283	194	148	107		-6.1%
8006	8928	9048	8256	6987	6802		0.3%
8318	6584	4286	2319	1644	1476		-5.8%
3082	3489	4043	4601	5043	5468		2.2%
4963	5489	5923	6357	6729	7102		1.7%
1027	1344	1783	2145	2432	2506		4.9%
142	210	289	386	479	533		5.8%
3215	4849	7362	10521	13206	15068		8.0%
1937	3504	5934	9214	11964	13712		10.4%

Net Zero scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
8	6	4	3	2	1		-6.1%
59	53	34	20	16	20		-3.1%
85	62	26	10	5	5		-8.9%
27	32	37	43	50	57		2.7%
44	49	52	55	59	62		1.6%
32	53	85	119	140	155		8.5%
20	42	82	122	144	155		11.2%
11	16	22	24	25	24		5.1%
2	3	4	5	5	5		6.1%

0	1	3	2	0	0		n/a
0	0	2	10	17	28		n/a
0	0	2	10	19	30		n/a

Net Zero scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
759	565	380	220	139	85		-6.8%
6954	6273	4229	2691	2265	2733		-2.5%
8885	6604	2797	1064	597	549		-8.7%
3108	3696	4433	5177	6165	7124		3.1%
5086	5700	6195	6691	7216	7741		1.9%
1237	1810	2554	2915	3048	2967		5.5%
189	301	455	551	614	651		6.5%
3693	6133	10100	14409	17194	19348		8.9%
2345	4949	9753	14728	17661	19367		11.6%

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
7	5	4	3	3	2		-4.3%
62	68	71	72	72	72		0.9%
98	94	94	90	87	83		-0.5%
26	27	28	29	30	31		0.7%
43	46	47	49	50	51		1.0%
22	33	42	54	65	78		6.2%
12	21	28	39	48	59		7.8%
6	8	9	10	10	11		2.6%
1	1	2	2	2	3		3.7%

0	0	1	1	2	4		n/a
0	0	0	0	0	0		n/a
0	0	0	0	0	0		n/a

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
640	452	353	273	203	146		-5.2%
7404	8283	8926	9333	9614	9848		1.5%
10198	9911	10085	9909	9740	9470		-0.2%
2944	3194	3293	3470	3706	3830		1.1%
4894	5316	5634	5951	6180	6409		1.3%
738	883	1012	1153	1269	1361		2.9%
122	154	189	230	272	316		4.1%
2543	3834	4999	6519	8044	9707		6.6%
1382	2394	3377	4680	5955	7319		8.2%

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United States

EJ unless otherwise noted	1995	2000	2005	2010	2015	2018	1995-2018
Consumption							CAGR (%)
United States	87	95	96	93	92	95	0.4%
Fuels							
Oil	35	38	40	36	36	37	0.2%
Natural gas ⁺	22	23	21	23	27	29	1.4%
Coal	20	23	23	21	16	13	-1.8%
Nuclear	7	8	8	8	8	8	0.3%
Hydro	3	3	3	2	2	3	-0.8%
Renewables*	1	1	1	3	4	6	9.5%
Oil (Mbd)	18	20	20	18	19	19	0.4%
Natural gas ⁺ (Bcm)	598	628	595	648	743	816	1.4%
Sectors ⁺							
Transport	23	26	28	26	27	28	0.8%
Industry	28	30	26	25	25	26	-0.4%
Non-combusted	5	6	5	5	5	6	0.8%
Buildings	31	34	37	37	35	36	0.7%
Inputs to power	35	39	40	39	37	37	0.3%
Production							
Oil	16	15	13	14	24	28	2.5%
Natural gas ⁺	18	19	18	21	27	30	2.2%
Coal	22	23	23	22	18	15	-1.6%
Oil (Mbd)	9	9	8	9	14	16	2.6%
Natural gas ⁺ (Bcm)	503	519	489	575	740	836	2.2%
Emissions							
Net CO ₂ emissions (Mt)	5266	5809	5900	5513	5168	5088	-0.1%

⁺Includes electricity and hydrogen; and their associated conversion losses.
⁺Renewables include wind, solar, geothermal, biomass, biomethane and biofuels.
⁺Natural gas does not include biomethane.

Rapid scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
						CAGR (%)	
90	84	77	73	70	67	-1.1%	
34	30	25	20	15	11	-3.6%	
30	27	22	20	18	16	-1.8%	
6	2	1	0	0	0	-17.3%	
7	7	6	5	5	5	-1.1%	
3	3	3	3	3	3	0.0%	
11	15	21	25	29	31	5.2%	
18	17	14	11	9	7	-3.3%	
832	747	606	552	496	458	-1.8%	
26	25	23	23	22	21	-0.8%	
24	23	22	21	21	21	-0.6%	
7	7	7	7	6	6	-0.1%	
33	29	25	23	20	18	-2.2%	
36	33	33	35	38	40	0.2%	
30	32	29	23	18	14	-2.1%	
35	35	33	30	28	28	-0.3%	
6	2	1	0	0	0	-17.0%	
18	19	17	14	11	9	-1.9%	
959	969	923	836	791	770	-0.3%	
4125	3314	2468	1841	1284	884	-5.3%	

Net Zero scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
						CAGR (%)	
92	85	78	74	71	69	-1.0%	
34	29	23	14	9	6	-5.7%	
28	22	15	13	11	10	-3.4%	
6	2	1	0	0	0	-18.4%	
7	7	7	7	7	8	0.1%	
3	3	3	3	3	3	0.5%	
14	23	30	37	41	44	6.4%	
18	16	13	8	5	3	-5.2%	
774	600	430	352	297	267	-3.4%	
26	25	22	22	22	22	-0.8%	
25	25	24	23	22	23	-0.3%	
7	7	6	5	4	4	-1.7%	
33	29	26	24	22	21	-1.7%	
39	38	39	45	49	52	1.1%	
4062	2979	1972	1094	520	122	-11.0%	

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
						CAGR (%)	
94	94	93	93	92	92	-0.1%	
35	33	31	29	27	25	-1.1%	
31	32	32	33	33	33	0.4%	
10	7	6	4	4	3	-5.0%	
7	7	5	4	3	1	-7.1%	
3	3	3	2	2	2	-0.2%	
9	13	16	20	24	27	4.8%	
19	18	17	16	15	14	-1.0%	
854	876	902	913	912	928	0.4%	
27	25	24	24	23	23	-0.6%	
25	25	25	24	24	23	-0.3%	
7	7	7	7	7	7	0.4%	
36	36	37	37	38	38	0.2%	
38	39	40	42	43	45	0.6%	
31	34	33	29	25	22	-0.7%	
35	37	39	39	41	42	1.1%	
14	12	10	7	6	5	-3.7%	
18	20	19	17	15	14	-0.5%	
966	1038	1088	1097	1133	1178	1.1%	
4643	4295	4025	3765	3526	3317	-1.3%	

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Brazil

EJ unless otherwise noted	1995	2000	2005	2010	2015	2018	1995-2018
Consumption							CAGR (%)
Brazil	7	8	9	11	12	12	2.6%
Fuels							
Oil	3	4	4	5	5	5	1.8%
Natural gas ⁺	0	0	1	1	2	1	8.7%
Coal	1	1	1	1	1	1	1.3%
Nuclear	0	0	0	0	0	0	6.9%
Hydro	3	3	3	4	3	3	1.4%
Renewables*	0	0	0	1	1	2	7.9%
Oil (Mbd)	2	2	2	2	3	2	1.9%
Natural gas ⁺ (Bcm)	5	10	20	28	43	36	8.7%
Sectors^a							
Transport	2	2	2	3	4	4	3.5%
Industry	3	3	4	5	5	5	2.1%
Non-combusted	0	0	0	1	1	1	1.1%
Buildings	2	2	2	3	3	3	2.7%
Inputs to power	3	4	4	5	5	5	2.9%
Production							
Oil	2	3	4	5	6	6	5.9%
Natural gas ⁺	0	0	0	1	1	1	7.0%
Coal	0	0	0	0	0	0	0.5%
Oil (Mbd)	1	1	2	2	3	3	5.8%
Natural gas ⁺ (Bcm)	5	8	11	15	24	25	7.1%
Emissions							
Net CO ₂ emissions (Mt)	230	278	308	368	448	401	2.4%

^aIncludes electricity and hydrogen; and their associated conversion losses.
*Renewables include wind, solar, geothermal, biomass, biomethane and biofuels.
*Natural gas does not include biomethane.

Rapid scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
13	15	16	17	19	20		1.5%
4	5	4	4	3	3		-1.6%
1	2	2	2	2	2		2.0%
1	1	1	0	0	0		-3.3%
0	0	0	0	0	0		4.0%
4	4	4	4	5	5		1.0%
3	4	5	6	8	9		5.1%
2	2	2	2	2	1		-1.6%
40	47	53	55	60	68		2.0%
4	4	5	5	6	6		1.4%
5	6	7	7	8	9		2.2%
1	1	1	1	1	1		0.8%
4	4	4	4	4	4		0.7%
6	7	9	10	12	14		3.0%
8	9	9	8	5	3		-1.9%
1	2	2	2	2	1		0.9%
0	0	0	0	0	0		-3.7%
4	4	4	4	2	1		-1.9%
31	42	50	56	44	34		0.9%
385	400	382	332	286	235		-1.6%

Net Zero scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
13	15	16	17	18	20		1.5%
4	4	4	3	2	1		-4.0%
1	1	1	1	2	2		1.3%
1	1	1	0	0	0		-8.4%
0	0	0	0	1	1		4.8%
4	4	5	5	5	5		1.2%
3	4	5	7	9	11		5.6%
2	2	2	2	1	1		-3.7%
32	32	31	38	46	55		1.4%
4	4	5	5	6	6		1.5%
5	6	7	8	8	10		2.4%
1	1	1	1	0	0		-0.7%
4	4	4	4	4	3		0.0%
6	7	9	11	13	15		3.2%
369	353	300	216	124	33		-7.5%

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
13	15	16	18	19	20		1.6%
5	5	5	6	6	6		0.5%
2	2	2	3	3	3		2.7%
1	1	1	1	1	1		-0.4%
0	0	0	0	0	0		3.3%
4	4	4	4	4	4		0.6%
2	3	4	5	6	6		3.9%
2	3	3	3	3	3		0.5%
45	53	61	69	78	85		2.7%
4	4	5	6	6	6		1.5%
5	6	7	7	8	8		1.9%
1	1	1	1	1	1		1.5%
4	4	4	4	5	5		1.3%
6	7	8	9	10	11		2.2%
8	9	10	10	9	8		1.0%
1	2	2	2	2	2		2.6%
0	0	0	0	0	0		-2.8%
4	4	5	5	4	4		1.0%
32	44	58	67	61	57		2.6%
405	436	472	493	508	506		0.7%

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EU

EJ unless otherwise noted	1995	2000	2005	2010	2015	2018	1995-2018
Consumption							CAGR (%)
EU	71	74	77	74	69	70	-0.1%
Fuels							
Oil	29	30	31	28	26	26	-0.5%
Natural gas ⁺	14	17	19	19	15	16	0.7%
Coal	15	13	13	12	11	9	-2.1%
Nuclear	9	9	10	9	8	7	-0.8%
Hydro	3	4	3	4	3	3	-0.3%
Renewables*	0	1	1	3	6	7	15.0%
Oil (Mbd)	14	15	15	14	12	13	-0.4%
Natural gas ⁺ (Bcm)	389	460	518	521	417	457	0.7%
Sectors ^A							
Transport	15	16	18	18	17	18	1.0%
Industry	28	28	28	25	23	23	-0.8%
Non-combusted	4	4	4	4	3	4	-0.7%
Buildings	24	25	27	27	25	25	0.1%
Inputs to power	27	29	31	30	29	29	0.3%
Production							
Oil	7	7	5	4	3	3	-3.6%
Natural gas ⁺	8	9	8	7	5	4	-3.0%
Coal	12	9	8	7	6	5	-3.4%
Oil (Mbd)	4	4	3	2	2	2	-3.1%
Natural gas ⁺ (Bcm)	221	245	222	183	125	109	-3.0%
Emissions							
Net CO ₂ emissions (Mt)	4106	4127	4305	3984	3530	3484	-0.7%

^AIncludes electricity and hydrogen; and their associated conversion losses.

*Renewables include wind, solar, geothermal, biomass, biomethane and biofuels.

*Natural gas does not include biomethane.

Rapid scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
65	61	57	55	52	49		-1.1%
23	19	14	10	7	5		-4.9%
15	13	11	10	8	7		-2.7%
5	2	1	1	0	0		-12.7%
7	7	7	7	6	5		-1.4%
3	3	3	3	3	3		0.3%
13	17	21	25	27	28		4.4%
11	9	7	5	4	3		-4.9%
413	365	313	268	220	191		-2.7%
17	17	17	18	19	19		0.1%
21	20	17	16	14	12		-2.1%
3	3	3	2	2	2		-2.6%
23	22	20	19	18	17		-1.2%
29	29	32	35	37	37		0.8%
3	3	2	1	1	1		-4.2%
2	2	1	1	0	0		-10.8%
2	1	1	0	0	0		-14.2%
2	1	1	1	1	1		-3.8%
65	45	25	14	6	3		-11.0%
2733	2118	1496	1034	712	474		-6.0%

Net Zero scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
65	60	57	55	52	49		-1.1%
22	18	12	7	4	2		-7.2%
14	11	9	7	5	4		-4.7%
5	2	1	1	0	0		-16.4%
7	7	7	7	8	8		0.4%
3	3	3	4	4	4		0.7%
15	19	25	31	32	31		4.6%
11	9	6	3	2	1		-7.1%
378	299	244	188	136	99		-4.7%
17	17	17	20	20	20		0.3%
21	19	17	14	12	11		-2.5%
3	3	2	2	1	1		-4.1%
24	22	21	19	18	18		-1.0%
30	30	34	39	40	40		1.1%
2661	1891	1165	608	250	12		-16.2%

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
66	63	60	58	55	53		-0.8%
24	21	19	16	14	12		-2.4%
16	15	15	14	13	12		-0.9%
7	4	3	3	2	2		-5.4%
6	6	4	3	3	3		-2.7%
3	3	3	3	3	3		0.0%
11	14	16	19	20	21		3.3%
12	11	9	8	7	6		-2.4%
451	426	411	396	369	346		-0.9%
18	17	16	16	16	17		-0.3%
22	21	19	18	16	15		-1.3%
3	3	3	3	2	2		-1.8%
24	23	22	21	20	19		-0.8%
29	29	29	31	31	32		0.3%
3	3	2	2	2	2		-1.7%
2	2	1	1	0	0		-10.8%
4	2	1	1	0	0		-7.6%
2	2	1	1	1	1		-1.6%
65	45	25	14	6	3		-11.0%
3034	2620	2298	1989	1751	1544		-2.5%

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Russia

EU unless otherwise noted	1995	2000	2005	2010	2015	2018	1995-2018
Consumption							CAGR (%)
Russia	28	26	27	28	28	30	0.4%
Fuels							
Oil	6	5	5	6	6	6	0.0%
Natural gas ⁺	13	13	14	15	15	16	0.9%
Coal	5	4	4	4	4	4	-1.3%
Nuclear	1	1	1	2	2	2	2.7%
Hydro	2	2	2	2	2	2	-0.2%
Renewables*	0	0	0	0	0	0	n/a
Oil (Mbd)	3	3	3	3	3	3	0.2%
Natural gas ⁺ (Bcm)	372	366	400	424	409	455	0.9%
Sectors[^]							
Transport	3	2	3	3	3	4	1.5%
Industry	16	16	17	16	16	16	-0.1%
Non-combusted	2	2	2	2	3	3	2.3%
Buildings	7	6	6	6	6	7	0.2%
Inputs to power	11	11	12	12	12	12	0.3%
Production							
Oil	13	14	20	21	23	24	2.6%
Natural gas ⁺	19	19	21	22	21	24	0.9%
Coal	5	5	6	6	8	9	2.5%
Oil (Mbd)	6	7	10	10	11	11	2.7%
Natural gas ⁺ (Bcm)	541	537	589	598	584	669	0.9%
Emissions							
Net CO ₂ emissions (Mt)	1575	1425	1447	1476	1476	1547	-0.1%

^aIncludes electricity and hydrogen; and their associated conversion losses

*Renewables include wind, solar, geothermal, biomass, biomethane and biofuels.

*Natural gas does not include biomethane.

Rapid scenario						
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)
30	30	29	28	27	27	-0.4%
7	6	6	5	5	4	-1.6%
17	16	16	15	14	13	-0.8%
3	3	2	1	1	0	-7.6%
2	2	2	3	2	2	0.9%
2	2	2	2	2	2	0.1%
0	0	1	3	4	5	21.7%
3	3	3	3	2	2	-1.4%
467	457	447	409	378	355	-0.8%
4	4	4	4	4	4	0.4%
15	14	13	12	12	11	-1.2%
4	4	4	5	5	5	1.5%
8	8	8	7	7	7	-0.3%
12	12	12	12	13	13	0.3%
24	24	23	20	17	14	-1.6%
27	29	29	28	24	24	0.0%
6	6	4	3	2	1	-6.7%
12	12	11	10	8	7	-1.6%
764	813	798	765	672	671	0.0%
1463	1363	1122	839	630	475	-3.6%

Net Zero scenario						
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)
31	31	30	29	29	28	-0.2%
7	6	6	4	3	2	-3.1%
17	16	14	10	8	6	-2.9%
4	3	2	1	0	0	-13.2%
2	2	3	3	3	4	2.1%
2	2	2	2	2	2	0.6%
0	1	4	9	12	14	25.3%
3	3	3	2	2	1	-2.8%
473	439	377	288	228	179	-2.9%
4	4	4	4	5	5	1.2%
16	15	14	13	13	13	-0.8%
4	4	4	4	4	3	0.4%
8	8	8	7	7	7	-0.2%
13	14	15	16	18	20	1.6%
1521	1388	1004	555	293	119	-7.7%

Business-as-usual scenario						
2025	2030	2035	2040	2045	2050	2018-2050 CAGR (%)
31	31	31	30	30	30	0.0%
7	7	7	7	7	7	0.1%
17	17	17	17	17	17	0.1%
3	3	2	2	2	1	-3.3%
2	2	2	2	2	2	0.5%
2	2	2	2	2	2	0.1%
0	0	0	1	1	1	16.2%
3	4	4	4	3	3	0.2%
476	472	479	473	468	464	0.1%
4	4	4	3	3	3	-0.2%
16	15	15	14	14	13	-0.6%
4	4	5	5	5	5	2.0%
8	8	8	8	8	8	0.1%
12	11	11	11	11	11	-0.4%
25	25	25	24	24	23	0.0%
27	29	32	33	32	33	1.0%
11	12	14	15	10	6	-1.2%
12	12	12	12	12	12	0.0%
748	810	877	920	896	917	1.0%
1511	1466	1414	1324	1252	1182	-0.8%

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Middle East

EJ unless otherwise noted	1995	2000	2005	2010	2015	2018	1995-2018
Consumption							CAGR (%)
Middle East	15	17	23	30	35	38	4.2%
Fuels							
Oil	9	10	13	15	17	17	2.7%
Natural gas ⁺	5	7	10	14	17	20	6.3%
Coal	0	0	0	0	0	0	1.8%
Nuclear	0	0	0	0	0	0	0.0%
Hydro	0	0	0	0	0	0	-1.3%
Renewables*	0	0	0	0	0	0	n/a
Oil (Mbd)	5	5	6	8	9	9	3.0%
Natural gas ⁺ (Bcm)	136	183	266	380	478	553	6.3%
Sectors*							
Transport	4	4	5	6	8	8	3.3%
Industry	6	7	8	11	13	14	4.0%
Non-combusted	1	1	2	3	4	4	6.5%
Buildings	4	5	7	10	11	12	4.4%
Inputs to power	5	5	8	10	12	13	4.8%
Production							
Oil	41	47	51	51	60	63	1.9%
Natural gas ⁺	5	7	11	17	22	25	7.2%
Coal	0	0	0	0	0	0	n/a
Oil (Mbd)	20	23	26	26	30	32	2.0%
Natural gas ⁺ (Bcm)	139	204	310	475	600	681	7.2%
Emissions							
Net CO ₂ emissions (Mt)	912	1055	1361	1730	2002	2099	3.7%

⁺Includes electricity and hydrogen; and their associated conversion losses.
^{*}Renewables include wind, solar, geothermal, biomass, biomethane and biofuels.
^{*}Natural gas does not include biomethane.

Rapid scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
39	42	43	43	42	40		0.2%
16	15	13	12	10	9		-2.0%
21	24	24	20	17	15		-0.8%
0	0	0	0	0	0		-4.7%
0	0	1	1	1	2		11.2%
0	0	0	0	0	0		1.1%
1	2	5	10	13	14		17.5%
9	8	7	7	6	6		-1.5%
585	667	668	566	479	426		-0.8%
8	8	7	7	7	6		-0.6%
14	14	14	14	13	12		-0.5%
5	5	6	6	6	6		1.1%
13	14	15	16	16	16		0.9%
14	16	18	19	20	21		1.4%
56	46	41	42	44	40		-1.4%
26	31	34	30	26	25		0.0%
0	0	0	0	0	0		0.9%
29	24	22	22	23	21		-1.3%
719	866	930	836	732	685		0.0%
2062	2074	1804	1396	1080	842		-2.8%

Net Zero scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
39	42	42	40	36	31		-0.6%
17	15	13	9	7	5		-3.7%
21	22	17	11	8	6		-3.5%
0	0	0	0	0	0		-5.7%
0	0	1	1	2	2		11.7%
0	0	0	0	0	0		1.8%
1	3	11	18	19	17		18.2%
9	8	7	6	4	3		-3.1%
579	624	467	316	235	176		-3.5%
8	8	7	7	7	6		-0.6%
14	15	15	14	12	10		-0.9%
5	5	5	5	5	4		-0.1%
13	14	15	14	12	10		-0.5%
16	19	20	21	21	20		1.2%
2102	2026	1379	817	490	237		-6.6%

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
40	44	47	50	52	53		1.1%
17	17	17	17	16	16		-0.3%
21	24	26	26	27	26		0.9%
1	1	1	1	1	1		4.1%
0	0	1	1	1	2		11.0%
0	0	0	0	0	0		1.1%
0	1	2	4	6	8		15.5%
9	9	9	9	9	9		-0.1%
597	678	717	730	739	729		0.9%
8	8	8	8	8	8		0.1%
14	16	17	18	18	18		0.7%
5	5	6	7	7	7		1.5%
13	15	16	17	19	20		1.7%
15	16	18	19	20	22		1.5%
58	53	52	55	60	63		0.0%
26	31	34	35	36	37		1.3%
0	0	0	0	0	0		1.6%
30	27	27	29	31	33		0.1%
728	874	931	979	1008	1014		1.3%
2166	2291	2360	2353	2310	2217		0.2%

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Africa

EJ unless otherwise noted	1995	2000	2005	2010	2015	2018	1995-2018
Consumption							CAGR (%)
Africa	10	11	14	16	18	19	2.8%
Fuels							
Oil	5	5	6	7	8	8	2.5%
Natural gas ⁺	2	2	3	4	5	5	5.3%
Coal	3	3	4	4	4	4	1.1%
Nuclear	0	0	0	0	0	0	-0.4%
Hydro	1	1	1	1	1	1	3.0%
Renewables*	0	0	0	0	0	0	15.8%
Oil (Mbd)	2	2	3	3	4	4	2.6%
Natural gas ⁺ (Bcm)	46	56	82	99	128	150	5.3%
Sectors ^A							
Transport	2	3	3	4	5	5	3.2%
Industry	5	5	6	7	7	8	2.3%
Non-combusted	1	1	1	1	1	1	0.8%
Buildings	3	3	4	4	5	6	3.5%
Inputs to power	4	5	5	6	7	8	2.8%
Production							
Oil	14	16	20	21	17	17	0.7%
Natural gas ⁺	3	5	6	7	7	9	4.4%
Coal	5	5	6	6	6	7	1.3%
Oil (Mbd)	7	8	10	10	8	8	0.7%
Natural gas ⁺ (Bcm)	87	135	171	202	204	236	4.4%
Emissions							
Net CO ₂ emissions (Mt)	693	760	910	1071	1174	1240	2.6%

^AIncludes electricity and hydrogen; and their associated conversion losses.
^{*}Renewables include wind, solar, geothermal, biomass, biomethane and biofuels.
^{*}Natural gas does not include biomethane.

Rapid scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
22	26	30	33	38	43	2.6%	
9	9	9	9	8	7	-0.3%	
7	8	10	10	11	12	2.6%	
4	3	3	2	1	1	-5.0%	
0	0	1	1	1	1	8.3%	
2	3	3	3	4	4	3.7%	
1	2	5	8	13	18	13.7%	
4	5	5	4	4	4	-0.3%	
181	230	264	278	292	338	2.6%	
5	6	7	7	8	8	1.5%	
9	11	12	14	16	19	2.9%	
1	1	1	1	1	2	2.5%	
7	9	10	11	13	14	2.8%	
10	13	16	20	24	30	4.3%	
14	12	9	7	5	3	-5.1%	
11	14	16	16	16	18	2.3%	
5	5	4	4	3	3	-2.6%	
7	6	5	4	3	2	-4.7%	
300	376	441	451	451	493	2.3%	
1325	1378	1378	1261	1159	1070	-0.5%	

Net Zero scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
22	26	29	32	36	40	2.3%	
9	9	9	7	5	4	-2.5%	
6	7	7	6	6	6	0.4%	
4	3	2	1	1	0	-8.4%	
0	0	1	1	1	2	8.9%	
2	3	3	3	4	4	4.0%	
1	3	7	13	19	24	14.8%	
4	4	4	4	3	2	-2.2%	
166	195	187	170	164	169	0.4%	
5	6	6	7	8	8	1.5%	
9	10	12	13	16	20	3.0%	
1	1	1	1	1	1	0.7%	
7	9	10	11	11	11	2.1%	
10	13	16	20	26	31	4.5%	
1316	1285	1093	790	507	285	-4.5%	

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050	2018-2050	
22	26	30	34	40	47	2.8%	
8	9	10	11	12	13	1.5%	
6	7	8	9	11	13	2.8%	
5	6	6	6	6	6	1.1%	
0	0	0	1	1	1	7.0%	
2	2	3	3	3	3	3.2%	
1	1	3	5	7	10	11.8%	
4	5	5	6	6	7	1.6%	
168	189	222	258	309	365	2.8%	
6	6	7	8	8	9	1.8%	
9	10	12	14	17	21	3.1%	
1	1	1	1	2	2	3.0%	
7	8	10	11	13	15	3.2%	
9	11	14	17	20	24	3.7%	
16	16	16	15	14	13	-0.7%	
10	13	14	16	18	20	2.7%	
6	6	6	6	5	3	-2.6%	
8	8	8	8	7	7	-0.6%	
285	356	401	445	486	552	2.7%	
1373	1522	1684	1813	1979	2140	1.7%	

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India

EJ unless otherwise noted	1995	2000	2005	2010	2015	2018	1995-2018
Consumption							CAGR (%)
India	11	13	17	23	29	34	5.2%
Fuels							
Oil	3	5	5	7	8	10	5.0%
Natural gas ⁺	1	1	1	2	2	2	5.2%
Coal	6	7	9	12	17	19	5.2%
Nuclear	0	0	0	0	0	0	6.6%
Hydro	1	1	1	1	1	1	2.2%
Renewables*	0	0	0	0	1	1	22.9%
Oil (Mbd)	2	2	3	3	4	5	5.3%
Natural gas ⁺ (Bcm)	18	25	34	59	48	58	5.2%
Sectors^a							
Transport	1	1	2	3	4	5	6.2%
Industry	5	7	9	12	15	17	5.2%
Non-combusted	1	1	1	1	2	2	4.9%
Buildings	3	4	5	6	8	10	4.7%
Inputs to power	5	7	8	11	14	17	5.2%
Production							
Oil	2	1	1	2	2	2	0.4%
Natural gas ⁺	1	1	1	2	1	1	1.8%
Coal	6	6	8	11	12	13	3.7%
Oil (Mbd)	1	1	1	1	1	1	1.1%
Natural gas ⁺ (Bcm)	18	25	29	47	28	27	1.8%
Emissions							
Net CO ₂ emissions (Mt)	780	970	1210	1668	2154	2491	5.2%

^aIncludes electricity and hydrogen; and their associated conversion losses.
*Renewables include wind, solar, geothermal, biomass, biomethane and biofuels.
*Natural gas does not include biomethane.

Rapid scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
44	53	60	65	70	75		2.5%
11	12	12	12	11	10		0.0%
4	7	10	11	11	12		5.6%
22	22	17	12	10	9		-2.2%
1	1	2	3	4	5		8.4%
2	2	2	2	3	3		2.4%
4	9	17	26	32	37		11.4%
6	6	6	6	6	5		0.1%
112	187	265	299	309	332		5.6%
6	7	8	10	11	13		3.4%
22	27	31	34	36	38		2.5%
3	3	4	4	4	5		2.4%
13	16	17	18	19	19		2.1%
24	31	37	43	49	55		3.8%
1	1	1	0	0	0		-7.7%
2	2	2	2	2	3		3.2%
17	14	11	8	6	6		-2.5%
1	1	1	0	0	0		-4.8%
45	43	43	49	66	76		3.2%
2958	3076	2473	1842	1463	1182		-2.3%

Net Zero scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
44	53	59	65	71	77		2.6%
11	11	10	8	5	4		-3.0%
4	5	6	6	6	8		4.2%
21	18	10	7	5	4		-4.8%
1	1	2	3	4	5		8.9%
2	2	2	3	3	3		2.8%
6	15	28	39	47	54		12.8%
6	6	5	4	3	2		-2.4%
107	149	156	162	174	215		4.2%
6	7	9	11	13	16		3.9%
23	27	30	33	36	39		2.6%
3	3	3	3	3	3		0.9%
13	15	17	18	19	20		2.2%
25	30	37	45	54	62		4.2%
2833	2530	1505	835	388	33		-12.6%

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
44	54	63	71	78	86		3.0%
11	13	15	16	17	19		2.0%
3	4	5	6	8	9		4.5%
25	29	32	33	34	35		1.9%
1	1	1	2	2	3		6.7%
2	2	2	2	2	2		2.0%
2	5	7	11	15	19		9.2%
6	7	8	8	9	10		2.0%
87	121	151	180	209	241		4.6%
6	7	9	10	11	14		3.5%
22	27	32	36	39	42		2.9%
3	3	4	4	5	6		3.0%
14	16	19	21	23	25		2.9%
23	29	34	38	43	48		3.4%
1	1	1	1	1	1		-0.9%
2	2	2	2	3	3		4.0%
18	21	22	21	26	27		2.4%
1	1	1	1	1	1		0.0%
47	49	53	62	82	96		4.0%
3173	3726	4179	4400	4583	4722		2.0%

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[Other Asia](#)

EJ unless otherwise noted	1995	2000	2005	2010	2015	2018	1995-2018
Consumption							CAGR (%)
Other Asia	17	21	27	32	37	41	4.0%
Fuels							
Oil	10	11	13	15	17	18	2.8%
Natural gas ⁺	3	5	7	8	9	10	5.2%
Coal	3	4	5	7	8	10	5.8%
Nuclear	0	0	0	0	0	0	-0.2%
Hydro	1	1	1	1	2	2	3.9%
Renewables*	0	0	0	0	1	1	10.4%
Oil (Mbd)	5	5	6	7	8	9	3.0%
Natural gas ⁺ (Bcm)	83	126	186	227	259	267	5.2%
Sectors ⁺							
Transport	5	6	7	8	10	11	3.9%
Industry	7	9	11	12	14	16	3.5%
Non-combusted	1	2	2	3	3	4	5.8%
Buildings	4	5	6	8	9	10	4.4%
Inputs to power	5	7	9	11	14	16	4.9%
Production							
Oil	6	6	6	6	5	5	-0.7%
Natural gas ⁺	5	7	9	10	11	11	3.6%
Coal	2	3	6	9	14	17	9.0%
Oil (Mbd)	3	3	3	3	3	3	-0.4%
Natural gas ⁺ (Bcm)	136	185	248	288	316	305	3.6%
Emissions							
Net CO ₂ emissions (Mt)	1050	1315	1657	1947	2254	2522	3.9%

⁺Includes electricity and hydrogen; and their associated conversion losses.
⁺Renewables include wind, solar, geothermal, biomass, biomethane and biofuels.
^{*}Natural gas does not include biomethane.

Rapid scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
49	54	58	61	64	66		1.5%
20	20	19	17	15	13		-1.0%
13	15	17	17	14	14		1.2%
10	9	7	5	4	3		-3.4%
0	1	1	1	1	2		5.5%
3	4	5	5	5	6		3.0%
2	5	9	17	24	27		11.4%
10	10	9	9	8	7		-0.9%
355	417	471	459	387	390		1.2%
13	14	15	16	17	17		1.3%
18	20	22	24	26	28		1.9%
4	5	5	5	5	5		0.7%
13	15	16	17	17	16		1.4%
21	24	28	33	38	42		3.2%
3	3	2	2	1	1		-4.8%
10	8	7	6	5	4		-3.3%
17	16	12	7	6	5		-4.1%
2	2	1	1	1	1		-4.2%
269	226	204	168	136	105		-3.3%
2812	2851	2449	1925	1501	1225		-2.2%

Net Zero scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
49	54	57	62	65	68		1.6%
19	19	16	13	9	6		-3.7%
12	12	11	10	9	9		-0.1%
11	10	6	4	2	2		-5.1%
0	1	1	1	2	2		6.4%
4	4	5	6	6	7		3.4%
3	8	18	29	37	42		12.9%
10	9	8	7	5	3		-3.3%
326	340	298	264	250	259		-0.1%
13	14	14	16	18	18		1.5%
19	21	22	24	27	31		2.1%
4	4	4	4	3	3		-0.9%
13	15	16	17	17	16		1.5%
21	25	30	37	45	51		3.8%
2810	2648	1861	1179	674	253		-6.9%

Business-as-usual scenario							
2025	2030	2035	2040	2045	2050		2018-2050
							CAGR (%)
50	56	61	66	71	76		2.0%
20	21	22	23	23	24		0.8%
11	13	14	15	15	16		1.6%
13	15	17	19	20	21		2.5%
0	0	0	1	1	1		2.7%
3	4	4	5	5	5		2.6%
1	2	3	5	7	10		7.7%
10	11	11	12	12	12		0.8%
309	352	382	407	426	437		1.6%
14	15	16	17	18	19		1.6%
19	21	23	26	28	30		2.1%
4	5	5	5	6	6		1.5%
13	15	17	18	20	21		2.3%
20	24	27	31	34	38		2.8%
3	3	3	3	4	3		-1.0%
10	8	8	7	6	5		-2.3%
19	21	23	24	24	27		1.3%
2	2	2	2	2	2		-0.8%
269	230	212	192	176	147		-2.3%
3037	3365	3657	3894	4085	4184		1.6%

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Definitions

Data

Unless noted otherwise, data definitions are based on the bp Statistical Review of World Energy

Primary energy comprises commercially-traded fuels, and excludes traditional biomass

The primary energy values of nuclear, hydro and electricity from renewable sources have been derived by calculating the equivalent amount of fossil fuel required to generate the same volume of electricity in a thermal power station assuming a varying conversion efficiency that is consistent with the estimated global average for thermal power generation.

A summary of the methodology used for converting non-fossil energy can be found here <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/methodology-for-converting-non-fossil-fuel-primary-energy.pdf>

Gross Domestic Product (GDP) is expressed in terms of real Purchasing Power Parity (PPP) at 2015 prices

Sectors

Transport includes energy used in road, marine, rail and aviation

Industry includes energy combusted in manufacturing; construction; the energy industry including pipeline transport; and for transformation processes outside of power generation

Non-combusted includes fuel that is used as a feedstock to create materials such as petrochemicals, lubricant and bitumen

Buildings includes energy used in residential and commercial building, plus agriculture, fishing and IEA's non-specified sector "Other"

Power includes inputs into power generation (including combined heat and power plants)

Regions

Developed is approximated as North America plus Europe plus OECD Asia

China refers to the Chinese Mainland

Other Asia includes all countries and regions in non-OECD Asia excluding mainland China and India

Fuels, carbon and materials

Oil unless noted otherwise includes: crude; natural gas liquids (NGLs); gas-to-liquids (GTLs); coal-to-liquids (CTLs); condensate; and refinery gains

Liquids includes all of oil plus biofuels

Renewables unless otherwise noted includes wind, solar, geothermal, biomass, biogas and biofuels and excludes large-scale hydro

Non-fossils includes renewables, nuclear and hydro

References to carbon emissions consider only CO2 emissions from fuel combustion

Plastics includes synthetic fibres