

Production of heat – by type

Terajoules

Table Notes

Direct use geothermal represents heat used directly for district heating, agriculture etc. without a commercial transaction taking place.

Direct use solar thermal represents heat used for the production of domestic hot water or for the seasonal heating of swimming pools (e.g. flat plate collectors, mainly of the thermosyphon type) without a commercial transaction taking place.

Please refer to the Definitions Section on pages ix to xv for the appropriate product description /classification, and xvi to xvii for the descriptions of relevant flows.

Figure 87: Heat production by region, 1990-2022

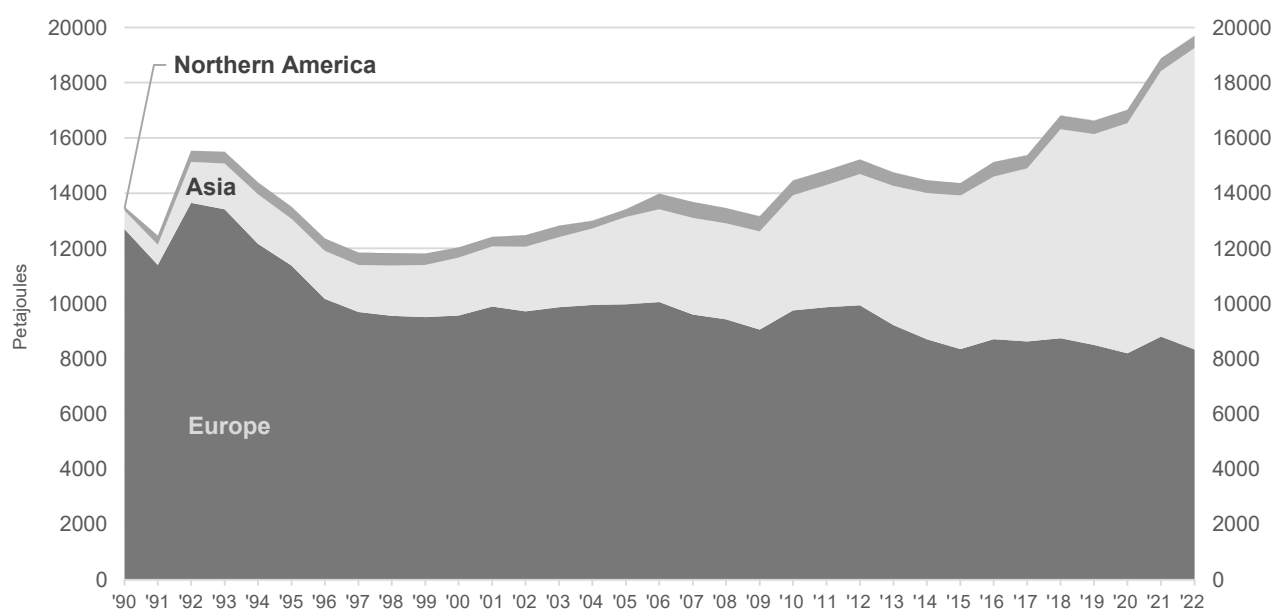


Figure 88: Major heat producing countries, 2022

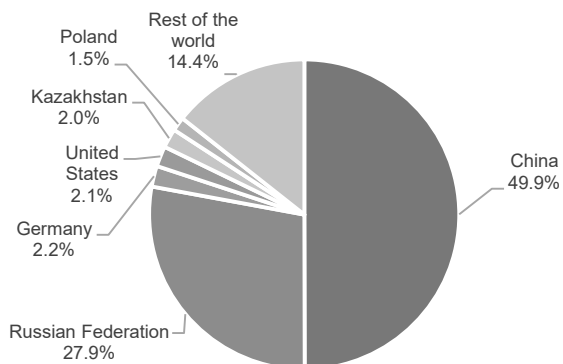


Figure 89: World heat production by type, 2022

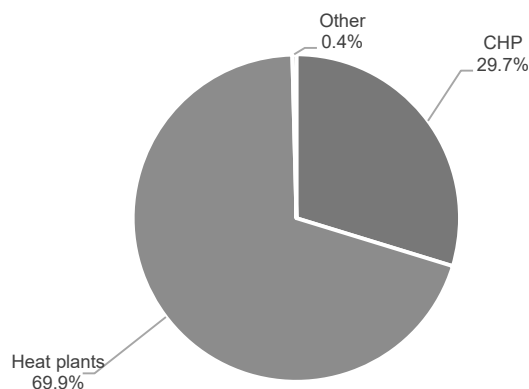


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Country or area	Year	Combustible fuels	Geo-thermal	Solar thermal	Nuclear	Chemical sources	Heat pumps and electric boilers	Other sources	Direct use geothermal	Direct use solar thermal
World	2019	15,948,967	51,386	8,387	25,647	76,533	67,533	455,496	146,421	342,515
	2020	16,367,642	49,412	8,921	25,012	49,585	67,612	455,392	144,977	354,941
	2021	18,179,308	50,224	8,741	26,137	52,421	71,030	499,142	147,477	407,309
	2022	19,039,364	49,614	9,357	24,071	46,641	67,972	472,018	150,508	428,973
Africa	2019	..	..	..	..	4,880	..	..	..	8,091
	2020	..	..	..	..	3,629	..	..	..	7,885
	2021	..	..	..	..	3,651	..	..	..	11,262
	2022	..	..	..	..	3,527	..	..	..	11,464
Botswana	2019	..	..	..	..	..	..	..	..	54
	2020	..	..	..	..	..	..	..	..	55
	2021	..	..	..	..	..	..	..	..	63
	2022	..	..	..	..	..	..	..	..	68
Morocco	2019	..	..	..	..	..	..	..	..	..
	2020	..	..	..	..	..	..	..	..	..
	2021	..	..	..	..	..	..	..	..	3,035
	2022	..	..	..	..	..	..	..	..	3,142
Namibia	2019	..	..	..	..	..	..	..	..	166
	2020	..	..	..	..	..	..	..	..	177
	2021	..	..	..	..	..	..	..	..	191
	2022	..	..	..	..	..	..	..	..	204
Senegal	2019	..	..	..	..	630	..	..	..	..
	2020	..	..	..	..	469	..	..	..	..
	2021	..	..	..	..	392	..	..	..	..
	2022	..	..	..	..	392	..	..	..	..
South Africa	2019	..	..	..	..	..	..	..	..	5,295
	2020	..	..	..	..	..	..	..	..	4,979
	2021	..	..	..	..	..	..	..	..	5,214
	2022	..	..	..	..	..	..	..	..	5,313
Tunisia	2019	..	..	..	..	4,250	..	..	..	2,576
	2020	..	..	..	..	3,160	..	..	..	2,673
	2021	..	..	..	..	3,259	..	..	..	2,759
	2022	..	..	..	..	3,135	..	..	..	2,737
Asia	2019	7,585,314	..	5,925	..	2,170	22,564	20,213	97,266	81,709
	2020	8,276,259	..	6,078	..	2,164	21,498	24,731	97,857	84,168
	2021	9,573,819	..	6,252	..	2,160	18,167	24,529	98,670	84,480
	2022	10,861,587	..	6,418	..	1,744	17,213	24,084	99,339	85,063
Armenia	2019	27	..	..	..	..	..	..	..	358
	2020	38	..	..	..	..	..	..	..	600
	2021	11	..	..	..	..	..	..	..	651
	2022	..	..	..	..	..	..	..	..	705
Azerbaijan	2019	14,013	..	..	..	..	3	..	..	..
	2020	13,661	..	..	..	..	2	..	..	..
	2021	14,678	..	..	..	..	8	..	..	..
	2022	14,104	..	..	..	..	22	..	..	..
China	2019	6,617,368	..	..	..	..	..	..	..	..
	2020	7,246,757	..	..	..	..	..	..	..	..
	2021	8,523,782
	2022	9,843,350
Cyprus	2019	51	3,062
	2020	37	3,114
	2021	37	3,168
	2022	40	3,218

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Country or area	Year	Combustible fuels	Geo-thermal	Solar thermal	Nuclear	Chemical sources	Heat pumps and electric boilers	Other sources	Direct use geothermal	Direct use solar thermal
Georgia	2019	..	..	..	..	..	..	..	680	130
	2020	..	..	..	..	..	..	..	591	131
	2021	..	..	..	..	..	..	..	628	141
	2022	..	..	..	..	..	..	..	637	152
Israel	2019	..	..	..	..	..	..	..	..	15,100
	2020	..	..	..	..	..	..	..	..	16,379
	2021	..	..	..	..	..	..	..	..	17,090
	2022	..	..	..	..	..	..	..	..	17,463
Japan	2019	12,462	..	..	..	..	7,586	2,590	5,367	7,736
	2020	11,673	..	..	..	..	6,508	3,081	5,367	7,063
	2021	18,607	..	..	..	..	6,197	3,111	5,367	6,460
	2022	18,071	..	..	..	..	6,266	3,121	5,367	5,961
Jordan	2019	..	..	..	..	..	..	..	..	9,098
	2020	..	..	..	..	..	..	..	..	9,131
	2021	..	..	..	..	..	..	..	..	9,224
	2022	..	..	..	..	..	..	..	..	8,570
Kazakhstan	2019	347,364	..	..	..	..	..	..	..	..
	2020	381,860	..	..	..	..	..	..	..	..
	2021	393,611	..	..	..	..	..	..	..	..
	2022	394,765	..	..	..	..	..	..	..	..
Korea, Republic of	2019	258,021	..	..	..	2,170	..	..	9,409	1,848
	2020	261,085	..	..	..	2,164	..	..	10,089	1,812
	2021	277,645	..	..	..	2,160	..	..	10,854	1,781
	2022	258,480	..	..	..	1,744	..	..	11,515	1,748
Kyrgyzstan	2019	12,424	..	..	..	..	..	..	..	..
	2020	13,332	..	..	..	..	..	..	..	..
	2021	13,637	..	..	..	..	..	..	..	..
	2022	13,515	..	..	..	..	..	..	..	..
Lebanon	2019	..	..	..	..	..	..	..	..	1,060
	2020	..	..	..	..	..	..	..	..	*1,060
	2021	..	..	..	..	..	..	..	..	*1,060
	2022	..	..	..	..	..	..	..	..	*1,060
Mongolia	2019	55,589	..	..	..	..	..	..	..	..
	2020	59,124	..	..	..	..	..	..	..	..
	2021	59,383	..	..	..	..	..	..	..	..
	2022	62,688	..	..	..	..	..	..	..	..
Nepal	2019	..	..	..	..	..	..	..	..	4,081
	2020	..	..	..	..	..	..	..	..	4,760
	2021	..	..	..	..	..	..	..	..	5,083
	2022	..	..	..	..	..	..	..	..	5,368
Other Asia	2019	91,765	..	..	..	..	..	..	..	4,231
	2020	93,319	..	..	..	..	..	..	..	4,372
	2021	99,348	..	..	..	..	..	..	..	3,352
	2022	88,305	..	..	..	..	..	..	..	3,985
State of Palestine	2019	..	..	5,925	..	..	..	..	..	..
	2020	6,078
	2021	6,252
	2022	6,418
Tajikistan	2019	3,519
	2020	3,612
	2021	3,695
	2022	3,695

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Country or area	Year	Combustible fuels	Geo-thermal	Solar thermal	Nuclear	Chemical sources	Heat pumps and electric boilers	Other sources	Direct use geothermal	Direct use solar thermal
Thailand	2019	..	..	..	..	..	..	..	..	423
	2020	..	..	..	..	..	..	..	..	444
	2021	..	..	..	..	..	..	..	..	456
	2022	..	..	..	..	..	..	..	..	458
Türkiye	2019	42,991	..	..	..	..	..	17,623	81,810	34,583
	2020	45,601	..	..	..	..	..	21,651	81,810	35,295
	2021	43,364	..	..	..	..	..	21,418	81,819	36,006
	2022	39,327	..	..	..	..	..	20,963	81,819	36,367
Turkmenistan	2019	10,861	..	..	..	..	..	..	..	..
	2020	12,436	..	..	..	..	..	..	..	..
	2021	13,708	..	..	..	..	..	..	..	..
	2022	15,736	..	..	..	..	..	..	..	..
Uzbekistan	2019	*118,859	..	..	..	..	..	*14,975	..	..
	2020	133,726	..	..	..	..	..	*14,988	..	..
	2021	112,313	..	..	..	..	..	*11,962	..	..
	2022	109,512	..	..	..	..	..	*10,926	..	..
Viet Nam	2019	..	..	..	..	..	..	..	..	..
	2020	..	..	..	..	..	..	..	..	7
	2021	..	..	..	..	..	..	..	..	7
	2022	..	..	..	..	..	..	..	..	7
Europe	2019	7,878,316	51,386	2,462	25,647	69,483	44,393	434,116	27,017	101,268
	2020	7,610,894	49,412	2,843	25,012	43,792	45,514	429,644	26,191	105,191
	2021	8,151,432	50,224	2,490	26,137	44,508	52,264	473,506	27,355	105,947
	2022	7,734,427	49,614	2,939	24,071	37,327	50,158	446,914	28,886	112,910
Albania	2019	..	..	..	..	..	..	..	..	590
	2020	..	..	..	..	..	..	..	..	564
	2021	..	..	..	..	..	..	..	..	569
	2022	..	..	..	..	..	..	..	..	624
Andorra	2019	37	..	..	..	..	..	..	..	..
	2020	43	..	..	..	..	..	..	..	..
	2021	72	..	..	..	..	..	..	..	..
	2022	111	..	..	..	..	..	..	..	..
Austria	2019	82,904	470	91	..	91	384	..	476	7,393
	2020	83,277	515	91	..	71	435	..	493	7,518
	2021	91,235	552	97	..	84	656	..	429	7,279
	2022	81,336	560	97	..	72	323	..	360	7,316
Belarus	2019	247,488	..	..	..	..	..	..	..	..
	2020	243,739	..	..	..	..	..	..	..	..
	2021	261,579	..	..	..	..	..	..	..	..
	2022	248,681	..	..	..	..	..	..	..	..
Belgium	2019	20,590	56	..	..	9,901	..	..	..	1,089
	2020	20,063	59	..	..	9,970	..	..	..	1,129
	2021	20,647	67	..	..	9,679	..	..	..	1,089
	2022	17,860	65	..	..	9,431	..	..	..	1,168
Bosnia and Herzegovina	2019	5,571	..	..	..	..	..	..	..	..
	2020	5,850	..	..	..	..	..	..	..	..
	2021	6,011	..	..	..	..	..	..	..	..
	2022	5,728	..	..	..	..	..	..	..	..
Bulgaria	2019	35,920	..	..	660	2,217	..	..	1,470	1,092
	2020	36,055	548	2,426	1,495	1,147
	2021	38,059	653	2,294	1,512	1,222
	2022	33,296	608	2,503	1,532	1,341

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Country or area	Year	Combustible fuels	Geo-thermal	Solar thermal	Nuclear	Chemical sources	Heat pumps and electric boilers	Other sources	Direct use geothermal	Direct use solar thermal
Croatia	2019	13,182	..	..	..	..	..	..	301	647
	2020	13,851	..	..	..	..	..	..	303	684
	2021	15,553	..	..	..	..	..	..	208	715
	2022	14,414	..	..	..	..	..	..	198	672
Czechia	2019	113,717	..	..	853	669	125	1,027	..	767
	2020	110,303	..	..	787	595	116	1,160	..	789
	2021	118,789	..	..	863	581	154	1,039	..	810
	2022	107,610	..	..	866	526	166	1,019	..	838
Denmark	2019	123,496	34	2,347	..	..	2,019	4,375	..	611
	2020	116,655	23	2,661	..	..	3,749	5,412	..	611
	2021	127,306	27	2,276	..	..	5,967	5,958	..	611
	2022	115,099	41	2,715	..	..	6,261	5,160	..	611
Estonia	2019	21,958	..	..	..	..	..	..	..	..
	2020	20,933	..	..	..	..	..	..	..	..
	2021	22,727	..	..	..	..	..	..	..	..
	2022	23,785	..	..	..	..	..	..	..	..
Finland	2019	165,855	..	..	..	4,567	4,283	10,570	..	91
	2020	149,472	..	..	..	4,241	4,250	13,069	..	100
	2021	168,978	..	..	..	4,144	5,865	15,197	..	110
	2022	159,067	..	..	..	3,928	5,541	13,266	..	110
France	2019	163,966	6,481	..	..	..	1,325	4,439	1,681	8,675
	2020	162,051	6,751	..	..	..	1,375	3,868	1,681	9,033
	2021	176,865	7,075	..	..	..	1,795	5,270	1,681	9,411
	2022	169,297	6,302	..	..	..	2,553	5,281	1,681	9,800
Germany	2019	449,842	1,732	13	..	..	..	6,341	3,390	30,525
	2020	416,246	1,940	41	..	..	10	7,297	3,426	32,016
	2021	460,506	1,928	68	..	..	11	7,106	3,963	30,716
	2022	419,415	3,021	77	..	..	7	5,066	3,906	34,974
Greece	2019	2,203	..	..	..	..	..	..	432	11,968
	2020	2,199	..	..	..	..	..	..	235	12,272
	2021	1,971	..	..	..	..	..	..	181	12,724
	2022	1,507	..	..	..	..	..	..	332	13,381
Hungary	2019	41,801	2,864	..	585	..	81	3,069	2,832	560
	2020	42,508	2,772	..	504	..	165	2,626	2,609	627
	2021	45,789	2,940	..	388	..	45	3,000	2,881	650
	2022	40,409	3,133	..	378	..	129	2,886	3,343	669
Iceland	2019	16	38,442	..	..	..	941	..	2,103	..
	2020	18	36,026	..	..	..	942	..	2,440	..
	2021	15	36,145	..	..	..	830	..	2,946	..
	2022	99	34,956	..	..	..	802	..	3,413	..
Ireland	2019	..	..	..	..	..	..	..	..	573
	2020	..	..	..	..	..	..	..	..	589
	2021	..	..	..	..	..	..	..	..	587
	2022	..	..	..	..	..	..	..	..	589
Italy	2019	230,526	870	6	..	..	..	..	5,477	9,544
	2020	228,030	872	8	..	..	..	..	5,014	9,887
	2021	91,776	1,072	10	..	..	..	..	4,815	10,323
	2022	84,279	1,074	9	136	511	4,591	11,010
Kosovo	2019	28	830	16
	2020	16	961	16
	2021	17	1,059	17
	2022	17	1,044	15

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Country or area	Year	Combustible fuels	Geo-thermal	Solar thermal	Nuclear	Chemical sources	Heat pumps and electric boilers	Other sources	Direct use geothermal	Direct use solar thermal
Latvia	2019	28,604	..	3	..	..	5	..	..	..
	2020	27,006	..	40	..	..	4	..	..	..
	2021	31,198	..	36	..	..	4	..	..	..
	2022	27,778	..	39	..	..	3	..	..	..
Liechtenstein	2019	..	..	..	..	..	..	..	..	36
	2020	..	..	..	..	..	..	..	..	36
	2021	..	..	..	..	..	..	..	..	34
	2022	..	..	..	..	..	..	..	..	33
Lithuania	2019	31,735	..	..	..	11,034	9	..	..	..
	2020	29,752	..	..	..	8,160	7	..	..	..
	2021	35,903	..	..	..	8,663	10	..	..	..
	2022	32,758	..	..	..	3,615	9	..	..	..
Luxembourg	2019	4,033	..	0	..	..	..	..	..	101
	2020	5,646	..	0	..	..	..	..	..	107
	2021	6,122	..	0	..	..	..	..	..	113
	2022	5,633	..	0	..	..	..	..	..	119
Malta	2019	1	..	..	..	..	..	..	..	212
	2020	..	..	..	..	..	..	..	..	214
	2021	..	..	..	..	..	..	..	..	151
	2022	..	..	..	..	..	..	..	..	134
Netherlands (Kingd. of the)	2019	104,713	..	..	..	9,031	..	..	5,564	1,180
	2020	93,673	..	..	..	12,419	..	..	6,185	1,176
	2021	98,898	..	..	..	11,811	..	..	6,327	1,164
	2022	92,531	..	..	..	10,773	7	..	6,798	1,168
North Macedonia	2019	2,057	..	..	..	..	..	..	205	..
	2020	2,533	..	..	..	..	..	..	196	..
	2021	2,678	..	..	..	..	..	..	195	121
	2022	2,068	..	..	..	..	..	..	185	121
Norway	2019	18,418	..	..	..	3,581	4,824	763	..	..
	2020	16,409	..	..	..	3,154	5,023	756	..	..
	2021	20,363	..	..	..	4,178	5,461	997	..	..
	2022	20,253	..	..	..	5,064	4,244	958	..	..
Poland	2019	286,234	..	..	..	528	3	286	1,050	3,009
	2020	285,225	..	..	..	456	5	189	1,073	3,355
	2021	307,313	..	..	..	774	5	280	1,189	3,566
	2022	285,600	..	..	..	495	5	258	1,318	3,801
Portugal	2019	20,927	..	..	..	..	..	..	72	4,033
	2020	20,546	..	..	..	..	..	..	55	4,216
	2021	16,673	..	..	..	..	..	..	57	4,416
	2022	11,538	..	..	..	..	..	..	75	4,628
Republic of Moldova	2019	9,670	..	..	..	..	..	..	..	..
	2020	9,365	..	..	..	..	..	..	..	..
	2021	10,518	..	..	..	..	..	..	..	..
	2022	8,848	..	..	..	..	..	..	..	..
Romania	2019	61,203	243	..	..	..	..	..	1,045	30
	2020	58,834	255	..	..	..	..	..	245	32
	2021	60,983	261	..	..	..	..	..	378	49
	2022	50,982	266	..	..	..	..	..	473	33
Russian Federation	2019	4,914,229	..	..	14,246	..	13,209	380,746	..	..
	2020	4,714,085	14,097	..	10,150	374,896
	2021	5,179,115	14,595	..	12,156	411,892
	2022	5,087,802	14,595	..	12,156	391,861

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Country or area	Year	Combustible fuels	Geo-thermal	Solar thermal	Nuclear	Chemical sources	Heat pumps and electric boilers	Other sources	Direct use geothermal	Direct use solar thermal
Serbia	2019	33,021	..	..	..	..	..	..	219	..
	2020	36,053	..	..	..	..	..	..	212	..
	2021	37,537	..	..	..	..	..	..	63	..
	2022	33,504	..	..	..	..	..	..	63	..
Slovakia	2019	29,079	175	2	1,882	..	130	14	58	316
	2020	28,617	181	2	1,848	..	87	16	30	334
	2021	30,233	136	2	2,009	..	81	18	30	358
	2022	26,524	174	2	1,836	..	108	16	30	380
Slovenia	2019	9,124	19	..	..	..	..	..	582	443
	2020	9,266	19	..	..	..	..	..	439	430
	2021	10,064	21	..	..	..	..	..	452	426
	2022	8,921	21	..	..	..	..	..	532	419
Spain	2019	..	..	..	..	..	..	..	8	13,170
	2020	..	..	..	..	..	..	..	8	13,716
	2021	..	..	..	..	..	..	..	8	14,116
	2022	..	..	..	..	..	..	..	8	14,408
Sweden	2019	170,111	..	..	..	..	16,175	21,301	..	446
	2020	154,890	..	..	..	..	18,191	20,354	..	436
	2021	184,605	..	..	..	..	17,133	22,749	..	425
	2022	172,599	..	..	..	..	15,635	20,631	..	410
Switzerland	2019	22,743	..	..	1,380	..	..	..	18	2,642
	2020	22,559	..	..	1,420	..	..	..	17	2,659
	2021	24,366	..	..	1,520	..	..	..	6	2,662
	2022	22,330	..	..	1,390	..	..	..	14	2,650
Ukraine	2019	346,992	..	..	6,041	27,865	52	1,185	..	..
	2020	378,863	..	..	5,809	2,300	45	..	..	..
	2021	380,840	..	..	6,109	2,300	1,031	..	..	..
	2022	257,830	..	..	4,398	920	1,031	..	..	..
United Kingdom	2019	66,323	..	..	..	..	..	..	34	1,507
	2020	66,263	..	..	..	..	..	..	34	1,497
	2021	66,127	..	..	..	..	..	..	34	1,512
	2022	64,917	..	..	..	..	..	..	34	1,488
Latin America & Carib.	2019	..	..	..	..	..	..	..	102	18,525
	2020	..	..	..	..	..	..	..	102	21,044
	2021	..	..	..	..	2,103	..	..	102	60,991
	2022	..	..	..	..	4,042	..	..	102	64,938
Brazil	2019	..	..	..	..	..	..	..	..	..
	2020	..	..	..	..	..	..	..	..	..
	2021	..	..	..	..	2,103	..	..	..	38,939
	2022	..	..	..	..	4,042	..	..	..	41,877
Chile	2019	..	..	..	..	..	..	..	..	2,919
	2020	..	..	..	..	..	..	..	..	2,919
	2021	..	..	..	..	..	..	..	..	3,051
	2022	..	..	..	..	..	..	..	..	3,051
Dominican Republic	2019	328
	2020	330
	2021	335
	2022	*340
Ecuador	2019	*102	..
	2020	*102	..
	2021	*102	..
	2022	102	..

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Country or area	Year	Combustible fuels	Geo-thermal	Solar thermal	Nuclear	Chemical sources	Heat pumps and electric boilers	Other sources	Direct use geothermal	Direct use solar thermal
Mexico	2019	..	..	..	..	..	..	..	..	13,796
	2020	..	..	..	..	..	..	..	..	16,280
	2021	..	..	..	..	..	..	..	..	17,083
	2022	..	..	..	..	..	..	..	..	18,066
Peru	2019	..	..	..	..	..	..	..	..	1,482
	2020	..	..	..	..	..	..	..	..	1,515
	2021	..	..	..	..	..	..	..	..	1,583
	2022	..	..	..	..	..	..	..	..	1,604
Northern America	2019	485,336	..	..	..	..	576	..	14,096	114,732
	2020	480,488	..	..	..	..	600	..	13,057	117,616
	2021	454,057	..	..	..	..	600	..	13,964	124,362
	2022	443,350	..	..	..	..	600	..	14,879	132,679
Canada	2019	22,258	..	..	..	..	..	..	..	1,810
	2020	22,456	..	..	..	..	..	..	..	1,782
	2021	23,040	..	..	..	..	..	..	..	1,448
	2022	23,700	..	..	..	..	..	..	..	1,397
Greenland	2019	*625	..	..	..	..	*576	..	..	..
	2020	*700	..	..	..	..	*600	..	..	..
	2021	*700	..	..	..	..	*600	..	..	..
	2022	*700	..	..	..	..	*600	..	..	..
St. Pierre-Miquelon	2019	32	..	..	..	..	..	..	..	..
	2020	36	..	..	..	..	..	..	..	..
	2021	42	..	..	..	..	..	..	..	..
	2022	*48	..	..	..	..	..	..	..	..
United States	2019	462,421	..	..	..	..	..	..	14,096	112,922
	2020	457,296	..	..	..	..	..	..	13,057	115,834
	2021	430,274	..	..	..	..	..	..	13,964	122,914
	2022	418,901	..	..	..	..	..	..	14,879	131,282
Oceania	2019	..	..	..	..	..	..	1,167	7,940	18,190
	2020	..	..	..	..	..	..	1,016	7,770	19,038
	2021	..	..	..	..	..	..	1,107	7,386	20,266
	2022	..	..	..	..	..	..	1,020	7,302	21,920
Australia	2019	..	..	..	..	..	..	..	..	17,603
	2020	..	..	..	..	..	..	..	..	18,449
	2021	..	..	..	..	..	..	..	..	19,675
	2022	..	..	..	..	..	..	..	..	21,328
French Polynesia	2019	..	..	..	..	..	..	..	..	80
	2020	..	..	..	..	..	..	..	..	81
	2021	..	..	..	..	..	..	..	..	83
	2022	..	..	..	..	..	..	..	..	84
New Caledonia	2019	..	..	..	..	..	..	..	..	141
	2020	..	..	..	..	..	..	..	..	141
	2021	..	..	..	..	..	..	..	..	141
	2022	..	..	..	..	..	..	..	..	141
New Zealand	2019	..	..	..	..	..	..	1,167	7,940	364
	2020	..	..	..	..	..	..	1,016	7,770	364
	2021	..	..	..	..	..	..	1,107	7,386	364
	2022	..	..	..	..	..	..	1,020	7,302	364
Samoa	2019	..	..	..	..	..	..	..	..	*3
	2020	..	..	..	..	..	..	..	..	*3
	2021	..	..	..	..	..	..	..	..	*3
	2022	..	..	..	..	..	..	..	..	*3