Czechia

The Czech targets come mainly from the Integrated National Energy and Climate Plan 2021-2030 (NECP). It does, however, look like most of the concrete targets are based on modelling, and might therefore not be applicable.

Targets

The main target for Czechia is that by 2030, non-ETS sector emissions should be reduced by 26% compared to 2005. And the government targets climate neutrality by 2050, in line with the EU Fit-for-55 target. Additionally, the share of renewables in gross final energy consumption is targeted to be 30% in 2030 according to a 2023 roadmap.[1] However, the Czech 'decarbonisation scenario' model estimates a 34% reduction.[2] To achieve this, the Czech government has set the following targets:

Table 1: target for Czechia's energy mix (share)[3]

	PEC[A] – Nuclear	PEC[A] - Renewables	GEP[B] - Nuclear	GEP[B] - Renewables
2030	22	23	44	31
2040	42	26	68	29
2050	38	41	46	52

A: Primary energy consumption

B: Gross electricity consumption

For energy efficiency Czechia has a non-binding target (Article 3) and two binding targets (Articles 5 and 7). These can be seen in Table 2 below.

Table 2: Energy efficiency targets[4]

		2020	**2030**
Article 3 (non-binding)	*Final Energy Consumption*	1 060 PJ	846 PJ
	Primary Energy Consumption	1 855 PJ	1 206 PJ
	Energy intensity of GDP		0.157 MJ/CZK
Article 5 (binding)		148.6 TJ	124.0 TJ
Article 7 (binding)	*Annual energy savings*	51.1 PJ	145 PJ
	Cumulated savings	204.39 PJ	669 PJ

While Czechia has estimations for installed capacity for renewables for 2030, these are not targets. For PVs the model estimates 10.1 GW, and 1.5 GW for wind. Both in total installed capacity.[5] The shares, however, are a minimum commitment. The Czech NECP includes a 'progressive scenario,' which the ČEPS (the Czech transmission system

[1] Government of Czechia, 'National Energy and Climate Plan Czechia', 23.
[2] Government of Czechia, 'National Energy and Climate Plan Czechia', 37.
[3] Government of Czechia, 'National Energy and Climate Plan Czechia', 25–26.
[4] Government of Czechia, 'National Energy and Climate Plan Czechia', 23.
[5] Government of Czechia, 'National Energy and Climate Plan Czechia', 5–6.

operator) considers the most likely trajectory of development of the Czech energy mix.[6] The estimates are presented in Table 3. New installation from 2022 is listed in Table 4.

Table 3: 'progressive scenario' of the Czech energy mix (MW)[7]

	PV	Wind	Nuclear	Fuel cells	Batteries	Others
2025	5159	617	4047	0	220	12222
2030	11406	958	4047	5	637	12024
2035	12567	1959	4047	13	1491	6610
2040	13238	2500	5187	29	2585	6615

Table 4: New installations (GW)[8]

	PV [WEM]	PV [WAM]	Wind [WEM]	Wind [WAM]	Nuclear [WEM]	Nuclear [WAM]
2022[9]	2.09	2.09	0.339	0.339	4.047	4.047
2030	2.9	10.1	0.7	1.5	4.047	4.047
2050	23.1	28.2	3.8	5.8	5.1	7.7
2030 -new	0.8	8.0	0.4	1.2	0	0
2050 -new	21.0	26.1	3.5	5.5	1.1	3.7

From the NECP: 'The Czech Republic does not consider it appropriate to anticipate the application of individual technologies for sources where there is a large number of technological options, which should be determined by market influences.'[10]

Energy demand projections

The new NECP does not feature a breakdown of energy demand. The old does, which can be seen in Table 2 of the old information section.

Transport

The transport policy envisages a gradual replacement of fossil fuels for 'alternative energy,' with more electrification of the rail network and moving freight from road to rail.[11] While it is never stated explicitly, transport seem to include all types of transport modes (road, rail, aviation, and maritime).[12] The updated NECP has removed energy and

[6] Government of Czechia, 'National Energy and Climate Plan Czechia', 253.
[7] Government of Czechia, 'National Energy and Climate Plan Czechia', 254.
[8] Government of Czechia, 'National Energy and Climate Plan Czechia', 354.
[9] Government of Czechia, 'National Energy and Climate Plan Czechia', 346. Nuclear capacity in 2022 is assumed to be 4.047 GW according to page 254.
[10] The Government of the Czech Republic, 'National Energy and Climate Plan of the Czech Republic 2021-2030', 34.
[11] The Government of the Czech Republic, 'National Energy and Climate Plan of the Czech Republic 2021-2030', 75.
[12] Page 222 of the NECP for instance defines public transport to include rail, bus, air, inland waterways, and urban public transport.

electricity demand projections, so it is not possible to see the estimated energy demand. The energy estimates for transport using hydrogen is found in Table 7 below.

Heating and cooling

The government will subsidise heat pumps, but no installation targets. The NECP does include an estimation of heat pump share in the heating and cooling sector.[13] This projection can be seen in Table 5 below. This is from the old NECP.

Table 5: Expected development of heat pumps

TJ	**2016**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Heat pumps	4441.8	6621.2	7166.0	7710.8	8255.6	8800.5	9345.3	9890.1	10 435.0	10 979.8	11 524.6	12 069.5

The new NECP estimates heat production (in PJ) for heat pumps and geothermal, with a breakdown for commercial heat pumps. See Table 6.

Table 6: heat production (PJ)[14]

	Nuclear [WEM]	Heat pumps [WEM]	Com. Heat pumps [WEM]	Nuclear [WAM]	Heat pumps [WAM]	Com. Heat pumps [WAM]
2025	0.3	0	0	0.2	0	0
2030	0.3	0.2	0	2.5	1.5	0
2035	0.3	3.1	0	2.5	33.7	15.7
2040	0.3	16.5	0	2.5	54.6	21.1
2045	0.3	19.7	2.8	2.5	60.0	21.1
2050	0.3	17.0	6.8	2.5	53.7	20.3

Hydrogen and batteries

The Czech government has developed a hydrogen strategy which includes projections up until 2050.[15] This includes a breakdown of hydrogen consumption by sector. This is found in Table 7. To produce the 1 728 kt/y as projected in the table below, hydrogen production would need 95 TWh of electricity.[16] Battery capacity can be found in Table 3 above.

[13] The Government of the Czech Republic, 'National Energy and Climate Plan of the Czech Republic 2021-2030', 33.
[14] Government of Czechia, 'National Energy and Climate Plan Czechia', 357–58.
[15] Ministry of Industry and Trade, 'The Czech Republic's Hydrogen Strategy'.
[16] Ministry of Industry and Trade, 'The Czech Republic's Hydrogen Strategy', 28.

Table 7: Low-carbon hydrogen consumption (kt/y)[17]

	Transport	Chemical	Metal	Industry	Electric + heat	households	Total	Electricity (TWh)[A]
2025	5	2	0	0	0	0	7	0.4
2030	62	10	7	5.4	0	13	97	5
2035	152	23	27	15.1	22	31	273	15
2040	297	56	364	32.2	45	63	857	47
2045	564	108	364	53.7	90	63	1241	68
2050	845	157	364	134.4	134	94	1728	95

A: Based on a conversion factor of approximately 0.055.

[17] Ministry of Industry and Trade, 'The Czech Republic's Hydrogen Strategy', 29–33.

Old information

Table 2: Energy and electricity production[18]

Energy Production (ktoe)			
	Nuclear	Renewables	Total
2020	8104.0	4408.2	27662.1
2025	8109.6	4915.7	22608.6
2030	8115.2	5492.2	23204.0
2035	9427.0	5774.3	22853.2
2040	11081.5	5873.3	20690.5
Primary energy sources (ktoe)			
2020	8104.0	4562.6	43325.5
2025	8109.6	5138.2	41572.4
2030	8115.2	5787.5	41431.0
2035	9427.0	6097.9	41026.5
2040	11081.5	6196.9	40027.3
Gross electricity production (GWh)			
2020	31102.5	11025.8	90204.0
2025	31124.0	12425.5	83301.4
2030	31145.4	13888.2	84567.2
2035	36179.7	15988.3	85089.5
2040	42529.5	17997.3	84007.5
Heat production (TJ)			
2020	892.5	10340.3	124808.7
2025	892.5	18283.8	120916.9
2030	892.5	22474.3	116350.4
2035	2499.9	26641.7	113347.1
2040	2635.3	29694.9	109409.4

Table 3: Development of final energy consumption by 2030 (PJ)[19]

		2015	**2016**	**2020**	**2025**	**2030**
Industry	*Total*	273.3	270.3	285.0	283.6	278.5
	Electricity		83.53	90.93	94.16	96.11
	Renewable		20.17	21.41	23.67	24.09
Transport	*Total*	259.4	268.6	275.5	285.4	293.6
	Electricity		5.89	6.87	7.85	9.57
	Renewable		12.58	18.56	22.55	29.78
Households	*Total*	285.0	296.8	288.5	281.6	273.8
	Electricity		53.77	55.17	57.02	59.04

[18] The Government of the Czech Republic, 'National Energy and Climate Plan of the Czech Republic 2021-2030', 341–45.
[19] The Government of the Czech Republic, 'National Energy and Climate Plan of the Czech Republic 2021-2030', 334–37.

	Renewable		75.01	75.21	84.46	93.69
Services	*Total*	123.2	127.7	126.4	121.4	115.6
	Electricity		55.18	57.71	57.04	55.81
	Renewable		2.62	2.65	2.73	2.81
Agriculture	*Total*	25.4	26.8	24.8	25.3	25.4
	Electricity		3.41	3.15	3.22	3.24
	Renewable		6.15	6.16	5.22	2.77
Other	*Total*	5.5	3.1	3.1	3.1	3.1
	Electricity					
	Renewable					
Total	*Total*	971.8	993.4	1003.4	1000.3	990.1
	Electricity		201.78	213.83	219.29	223.76
	Renewable		116.53	123.99	138.63	153.13

Table 4: Number of electric and hybrid vehicles[20]

	2015	**2020**	**2025**	**2030**	**2034**	**2040**
Total	~ 0	14 000	95 000	255 000	371 000	403 000
EV	~ 0	5 000	33 000	220 000 – 500 000[A]	-	-
Hybrid	~ 0	9 000	62 000	-	-	-
Hydrogen cars	0	53	12 782	117 169		
Hydrogen buses	-	2	119	1 091		
Hydrogen stations	1	1	35	308		

A: This is a target level which corresponds to between 3 and 7% of the total vehicle fleet.

[20] The Government of the Czech Republic, 'National Energy and Climate Plan of the Czech Republic 2021-2030', 97.