

REPUBLIC OF SLOVENIA

**Report on the implementation of the national policy framework under Directive
2014/94/EU of the European Parliament and of the Council on the deployment of
alternative fuels infrastructure**

Ministry of Infrastructure, Directorate for Sustainable Mobility and Transport Policies

Ljubljana, November 2019

EXECUTIVE SUMMARY.....	3
1. LEGAL MEASURES.....	4
2. POLICY MEASURES SUPPORTING THE IMPLEMENTATION OF THE NATIONAL POLICY FRAMEWORK	5
3. DEPLOYMENT AND MANUFACTURING SUPPORT	12
4. RESEARCH, TECHNOLOGICAL DEVELOPMENT AND DEMONSTRATION (RTD&D)	12
5. OBJECTIVES FOR THE DEVELOPMENT OF ALTERNATIVE FUELS IN TRANSPORT IN SLOVENIA.....	16
6. ALTERNATIVE FUELS INFRASTRUCTURE DEVELOPMENTS.....	20

EXECUTIVE SUMMARY

Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure was published in the Official Journal of the EU on 22 October 2014. Alternative fuels under that Directive include electricity, natural gas (LPG — Liquefied Petroleum Gas, CNG – compressed natural gas and LNG – liquefied natural gas), biomethane, biofuels, synthetic and paraffinic fuels and hydrogen (H₂).

Article 3 of the Directive requires EU Member States to adopt a 'national policy framework for the development of the market as regards alternative fuels in the transport sector, and the deployment of the relevant infrastructure' by 18 November 2016. That part of the Directive has been transposed into the Slovenian legal system by the Strategy for market development for the deployment of an alternative fuels infrastructure in the transport sector of the Republic of Slovenia (hereinafter: the Strategy). The Government of the Republic of Slovenia adopted the Strategy on 12 October 2017 and, at the same time, decided that the Ministry of Infrastructure would prepare an Action Programme for Alternative Fuels Action in Transport on the basis of the Strategy.

Article 10 of the Directive also requires EU Member States to report on the implementation of the national policy framework by 18 November 2019 and every three years thereafter. The report is to cover the information listed in Annex I and, where appropriate, include a relevant justification regarding the level of attainment of the national targets and objectives referred to in Article 3(1). The Ministry of Infrastructure has produced a report on the implementation of the Action Programme for Alternative Fuels in Transport 2016-2019 and has provided a plan for the implementation of the Programme in the coming years for the measures funded by sources determined by the national programmes and financial plans, which have already been adopted.

The report contains a description of the measures taken by Slovenia to support the deployment of alternative fuels infrastructure and promote the purchase and use of alternatively powered vehicles. The report is drawn up on the basis of proposals from the members of the European Commission Committee on Alternative Fuels Infrastructure. The summary tables for each policy are therefore completed in English, whilst the detailed description of the measures is provided in the Slovenian language.

1. LEGAL MEASURES

To date, the Government of the Republic of Slovenia has adopted five legal measures to promote alternative fuels in transport. In addition to the transposition of Directive 2014/94/EU into the Slovenian legal order, there are four more measures directly related to the promotion of the use of alternatively powered vehicles and to tax and duty relief.

Table A1: Legal measures

CATEGORY	No.	DENOMINATION	DESCRIPTION	AF FIELD	ALTERNATIVE FUEL	TYPE	TRANSPORT MODE	APPLICATION LEVEL	Start Year	Stop Year	Observations
Legislative & Regulatory	1	Decree establishing the infrastructure for alternative transport fuels.	Transposition of Directive 2014/94/EU into national law	AFI	Combination	National targets	Combination	National	2017	-	Applies to all alternative fuels and transport modes.
Legislative & Regulatory	2	Motor Vehicle Charges Act	Annual road tax exemption for electric vehicles.	AFV	Electricity	Other	Road	National	2008	-	
Legislative & Regulatory	3	Motor Vehicles Tax Act	Lower tax rate (0,5 %) for vehicles that release up to 110 g CO ₂ /km (includes alternative fuels).	AFV	Combination	Other	Road	National	2010	-	Applies to all alternative fuel vehicles that release CO ₂ emissions lower than 110 g/km.
Legislative & Regulatory	4	Personal Income Tax Act	Lower monthly tax rate on bonus earnings for usage of company electric car for private purposes (0,3 % for electric cars vs 1,5 % for other cars).	AFV	Electricity	Other	Road	National	2019	-	
Legislative & Regulatory	5	Corporate Income Tax Act	Investment tax credits. Deduction of 40 % of investments costs from tax basis for hybrid or electric passenger cars, hybrid or electric buses and cargo vehicles with an engine meeting the minimum emission requirements of EURO VI.	AFV	Combination	Other	Road	National	2015	-	Applies to hybrid or electric passenger cars, hybrid or electric buses and cargo vehicles with an engine meeting the minimum emission requirements of EURO VI.

Decree on the deployment of infrastructure for alternative transport fuels

The Decree on the deployment of infrastructure for alternative transport fuels (*Uradni List RS* (UL RS; Official Gazette of the Republic of Slovenia) No 41/17), which transposes Directive 2014/94/EU into Slovenian law, entered into force on 12 August 2017. The Decree governs alternative transport fuels and the way infrastructure is provided for them.

The Motor Vehicle Duties Act (UL RS No 54/17), which replaces the previous Annual Fee for Use of Motor Vehicles Act (ZLDUVCP).

Since 2008, motor vehicles with only an electric propulsion engine are exempt from annual vehicle duty (Article 8 ZDajMV) (for example, for passenger cars with an engine capacity of up to 1 350 cm³, that duty amounts to € 62 per year, for vehicles with an engine capacity between 1 350 cm³ and 1 800 cm³, € 96 per year, and for vehicles with an engine capacity between 1 800 cm³ and 2 500 cm³, € 153 per year).

Act amending the Motor Vehicles Tax Act (UL RS No 9/10)

Article 6 of the Act provides for a minimum tax rate (0.5%) for all vehicles emitting CO₂ up to and including 110 g/km, including alternatively powered vehicles. That provision has been in force since 2010.

Personal Income Tax Act (ZDoh-2), Personal Income Tax Act (UL RS No 13/11 — official consolidated version, 9/12 – Constitutional Court Decision, 24/12, 30/12, 40/12 – ZUJF, 75/12, 94/12, 52/13 – Constitutional Court Decision, 96/13, 29/14 – Constitutional Court Decision, 50/14, 23/15, 55/15, 63/16, 69/17, 21/19, 28/19 and 66/19)

Article 43 (paragraph 2a) of the Act provides that, where an employer provides an employee with an electric vehicle for private use, regardless of whether the vehicle is actually used for private purposes, and regardless of the manner in which the employer has acquired the vehicle, the employee's taxable base is to include 0.3% of the purchase value of the vehicle per month, for each calendar month or part thereof in which the vehicle is used, provided the acquisition value does not exceed EUR 60,000 including value added tax; otherwise, the rate is that for other vehicles, i.e. 1.5%. That provision has been in force since 6 November 2019 and applies as from 1 January 2020.

Corporate Income Tax Act (ZDDPO-2) (UL RS Nos 117/06, 56/08, 76/08, 5/09, 96/09, 110/09 – ZDavP 2B, 43/10, 59/11, 24/12, 30/12, 94/12, 81/13, 50/14, 23/15, 82/15, 68/16, 69/17, 79/18 and 66/19)

Under the Corporate Income Tax Act (Article 55a), the taxpayer is entitled to a reduction of the tax base of 40% of the amount invested in equipment and in intangible assets, but at most equal to the tax base. Equipment giving rise to a reduction in the tax base includes passenger cars with hybrid or electrical propulsion and to buses with hybrid or electrical propulsion and to motorised goods vehicles that at least meet the EURO 6 emission requirements. That provision has been in force since 2015.

2. POLICY MEASURES SUPPORTING THE IMPLEMENTATION OF THE NATIONAL POLICY FRAMEWORK

Since 2011, the Eco Fund (Slovenian Public Fund for the Environment) has awarded grants for electric cars (and plug-in hybrid vehicles) to natural and legal persons. Table A2: Policy measures (**measures M1.1 and M1.2**) shows the commitment appropriations in 2016-2018. For 2019, the amount of funds allocated is taken from public calls 64SUB-EVOB19 and 66SUB-EVPO19. The figures for 2020 are estimated values as they are taken from the draft Eco Fund programme for 2020.

Under measure M1.1 and M1.2, the level of incentives is set according to individual vehicle categories, namely:

— EUR 7,500 for a new electric vehicle without CO₂ emissions, or an electrically powered vehicle, category M1;

- EUR 4,500 for a new electric vehicle without CO₂ emissions, or an electrically operated vehicle, categories N1 or L7e;
- EUR 4,500 for a new plug-in hybrid vehicle or a new electric vehicle with a range extender with CO₂ emissions of less than 50 g CO₂/km, category M1 or N1;
- EUR 3,000 for a new electric vehicle without CO₂ emissions, or an electrically powered vehicle, category L6e.

Under the Energy Act, funds for the implementation of the Eco Fund programme are provided from contributions collected to increase energy efficiency.

In 2017 and 2018, the Fund also allocated financial incentives to promote sustainable mobility for the purpose of visiting nature conservation areas; for the installation of recharging points for electric vehicles (**measure M1.3**). The incentives were granted to municipalities and covered 100% of the investment in the installation of the recharging point. EUR 2 million (1 million in 2020 and 1 million in 2021) have also been earmarked for the installation of public recharging points for electric vehicles under the Cohesion Fund public call in 2020 and 2021, to be drawn up by the Ministry of Infrastructure.

In 2018 (**measure M1.4**), the Eco Fund increased the funds under public call 50SUB-AVPO17 for municipalities to purchase new buses for the provision of public passenger transport in municipalities that had adopted ordinances on an air quality plan by EUR 5.8 million in total. The funds are being provided by the Climate Change Fund. Municipalities were able to obtain funds for:

- the purchase of new electric vehicles with no CO₂ emissions;
- the purchase of new plug-in hybrid electric vehicles;
- the purchase of new CNG or LNG powered vehicles.

The grant covers up to 80% of the price of the individual vehicle, excluding VAT, but not more than:

- EUR 300,000.00 for each new electric motor vehicle with no CO₂ emissions;
- EUR 250,000.00 for each new plug-in hybrid electric vehicle;
- EUR 200,000.00 for each new CNG or LNG powered vehicle.

Grants for municipalities to buy public passenger transport vehicles will continue in 2020 in the context of public call 70SUB-PP19 from the Climate Change Fund, but only for zero-emission vehicles powered by electricity or hydrogen. The budget is EUR 10 million.

Since 2004, the Eco Fund has also granted loans on favourable terms (**measure M1.5**) for the purchase of green electric or hybrid vehicles (a combination of internal combustion engine and one or more electric motors) for road transport where CO₂ emissions in combined mode of driving currently do not, according to the manufacturer's data, exceed 110 g/km. For the general public, loans for gas vehicles are also available. These are granted for new vehicles or second-hand vehicles purchased from a registered vehicle dealer. In the years 2016-2018, a total of EUR 20.1 million of repayable funding was allocated. The loan is granted as a proportion (percentage) of the value of the recognised investment costs. Loans may amount up to 85% of the eligible costs.

In 2019, public call 68SUB-KV19 was opened for grants worth EUR 0.9 million to municipalities for the purchase of new municipal vehicles (**measure M1.6**) in municipalities with an adopted ordinance on an air quality plan (Climate Change Fund). Electrically-powered vehicles, plug-in hybrids and CNG or LNG powered vehicles were eligible for co-financing. Funding is also foreseen in 2020 and 2021 for co-financing the purchase of freight vehicles (**measure M1.7**) running on CNG, LNG and LPG, which will be administered by the Ministry of Infrastructure.

Slovenia encourages the use of alternatively powered vehicles in the context of joint government procurement. Between 2016 and 2019, the Ministry of Public Administration, in the context of

government procurement, purchased 70 alternatively powered vehicles at a total cost of EUR 2.13 million (**measure M1.8**) of which 58 were battery-electric vehicles, nine plug-in hybrid electric vehicles and three powered by compressed natural gas. In the future, under the Decree on Green Public Procurement, purchases of alternatively powered vehicles in joint government procurement will increase.

Based on the number of electric vehicles and the average level of duty for a given type of vehicle, it is estimated that the exemption for electric vehicles from vehicle excise duty led to a total drop in revenue, in the years 2016 to 2019, of EUR 0.465 million (**measure M1.9**).

In 2020, the Ministry of Infrastructure will start establishing a register of alternative transport fuel stations (**measure M1.10**). The Information Database on the location of refuelling and recharging points for alternative fuels is expected to be in place by 31 December 2020.

There are plans to promote the development of alternative fuels infrastructure in public passenger transport (**measures M2.1 to M2.4**) after 2019. Under the proposal for a 6-year investment plan for transport and transport infrastructure for 2020-2025, a substantial investment in the renewal of the public passenger vehicle fleet (**measure M2.1**) is foreseen, which will in parallel require adequate charging infrastructure. European cohesion policy provides funding in the Western Cohesion Region for measures in the field of electro-mobility for public passenger transport under the European Regional Development Fund (**measure M2.3**). Provision is also made for refuelling infrastructure for CNG (**measure M2.2**) and for placing a public hydrogen refuelling station in the municipality of Velenje (**measure M2.4**).

The report does not immediately provide for measures to promote private infrastructure for electro-mobility, as the State aid scheme for private sector aid beneficiaries has not yet been set up. It is expected to be established in 2020 on the basis of an amendment to the Energy Act. On the basis of an approved State aid scheme, the Action Programme for Alternative Fuels in Transport will be renewed. In the area of European cohesion policy, programming for the new programming period 2021-2027 is under way and will be a major source of funding for measures in the field of alternative fuels for transport.

Table A.2: Policy measures

CATEGORY	No.	DENOMINATION	DESCRIPTION	AF FIELD	TYPE	INDICATOR	ALTERNATIVE FUEL	TRANSPORT MODE	APPLICATION LEVEL	CURRENT AND PAST ANNUAL BUDGET [k€]				FUTURE ESTIMATED BUDGET [k€]			Observations	
										2016	2017	2018	2019	2020	2021-2025	2026-2030		
M1 - Measures to ensure national targets and objectives	M1.1	Public call (non-repayable funds)	Direct incentives for purchase of alternative fuel vehicles for natural persons.	AFV	Financial incentives	Subsidies	Combination	Road	National	€950	€1,560	€1,980	€1,800	€2,500			Incentives for purchase of electric vehicles and plug-in hybrid electric vehicles.	
	M1.2	Public call (non-repayable funds)	Direct incentives for purchase of alternative fuel vehicles for legal entities.	AFV	Financial incentives	Subsidies	Combination	Road	National	€960	€1,900	€2,440	€1,800	€2,500			Incentives for purchase of electric vehicles and plug-in hybrid electric vehicles.	
	M1.3	Public call (non-repayable funds)	Direct incentives to municipalities for establishment of public charging stations for electric vehicles.	AFI	Financial incentives	Subsidies	Electricity	Road	National	€ -	€480	€720	€ -	€1,000	€1,000			
	M1.4	Public call (non-repayable funds)	Direct incentives to municipalities for purchase of alternative fuel vehicles for public transport.	AFV	Financial incentives	Subsidies	Combination	Road	National	€ -	€ -	5,800	€ -	€10,000			Incentives for purchasing new public transportation vehicles powered by alternative fuels: BEV, PHEV, CNG, LNG, H2 (2018); H2, BEV (2020).	
	M1.5	Public call (repayable funds)	Loans to natural persons and legal entities for	AFV	Financial incentives	Other support	Combination	Road	National	€2,324	€6,202	€12,463					Loans for purchase of electric vehicles (BEV), plug-in	

			purchase of alternative fuel vehicles.			schemes											hybrid electric vehicles (PHEV) and gas powered vehicles (LPG, CNG).
M1.6	Public call (non-repayable funds)	Direct incentives to municipalities for purchase of municipal vehicles powered by alternative fuels.	AFV	Financial incentives	Subsidies	Combination	Road	National	€ -	€ -	€ -	€900					Incentives for purchasing new municipal vehicles powered by alternative fuels: BEV, PHEV, CNG, LNG.
M1.7	Public call (non-repayable funds)	Direct incentives to legal entities for purchase of cargo vehicles powered by alternative fuels.	AFV	Financial incentives	Subsidies	Combination	Road	National	€ -	€ -	€ -	€ -	€2,000	€1,500			Direct incentives to legal entities for purchase of cargo vehicles powered by CNG, LNG, LPG.
M1.8	Public procurement	Joint public procurement by the Government of the Republic of Slovenia in support of alternative fuels.	AFV	Other	Other support schemes	Combination	Road	National	€303	€1,019	€193	€617	€500	€2,500			Purchase of alternative fuel vehicles 2016-2019: BEV (58), PHEV (9), CNG (3).
M1.9	Annual road tax exemption	Annual road tax exemption for electric vehicles.	AFV	Financial incentives	Taxes reduction / exemption	Electricity	Road	National	€65	€100	€150	€150	€623	€4,759			
M1.10	Register for alternative fuel filling stations	Establishment of a register of alternative fuel filling stations.	AFV	Other	Other support schemes	Combination	Road	National	€ -	€ -	€ -	€ -	€80	€120			Establishment of a register of alternative fuel filling stations for electric vehicles,

																		CNG, LNG, LPG.
M2 - Measures that can promote AFI in public transport services	M2.1	Direct incentives (non-repayable)	Incentives for purchase of alternative fuel vehicles in public transport.	AFV			Combination	Road	National								€78,500	Incentives for purchasing new public transportation vehicles powered by alternative fuels: BEV, PHEV, CNG, H2.
	M2.2	Direct incentives (non-repayable)	Direct incentives for establishment of public CNG filling stations.	AFV			CNG (incl. Biomethane)	Road	National								€4,000	
	M2.3	Direct incentives (non-repayable)	Direct incentives for establishment of charging stations and purchase of electric vehicles for public transportation.	Combination			Electricity	Road	Regional								€4,160	Direct incentives for establishment of charging stations and purchase of electric vehicles for public transportation.
	M2.4	Direct incentives (non-repayable)	Direct incentives for establishment of public H2 filling station.	AFV			Hydrogen	Road	National								€1,000	
M3 - Measures that can promote the deployment of private electro-mobility infrastructure	M3.1			Select:			Select:	Select:										
	M3.2			Select:			Select:	Select:										
				Select:			Select:	Select:										
										TOTAL	€4,602	€11,262	€23,746	€5,267	€24,203	€92,539	€ -	

3. DEPLOYMENT AND MANUFACTURING SUPPORT

The data on public funds for the deployment of alternative fuels infrastructure are shown in Table A2: Policy measures.

Public funds to support manufacturing plants for alternative fuels technologies have not yet been allocated, with the exception of research and application projects, as shown in Table A.4: RTD&D. The State aid scheme for that activity is has not yet been set up.

4. RESEARCH, TECHNOLOGICAL DEVELOPMENT AND DEMONSTRATION (RTD&D)

Slovenia is not lagging behind the rapid development we have seen at the global, European and local levels, as it has, in addition to many large and smaller visionary and innovative companies, high quality world-class research teams. This country's system is set up to provide research teams with a stable environment and incentives for their work, which contributes to achieving the objectives set out in its strategic documents. Ministries draw up legislation and strategic programmes, within their respective competences, and thus form the basis for establishing appropriate conditions for all stakeholders, including researchers. High quality and strong research teams in the country are the result of years of investment in education, training and the development of appropriate human resources in these areas.

The funding of research from domestic sources is one of the fundamental conditions for the successful functioning of the Slovenian research teams in the field of alternative fuels, but the current systemic funding of research in Slovenia by the Research and Development Agency of the Republic of Slovenia (SRA) needs to be bolstered. Unfortunately, research in Slovenia is not fully supported in practice. The resolution on Slovenia's research and innovation strategy does not classify individual research disciplines according to national priorities, which certainly include research on alternative transport fuels. It merely provides a basic framework governing research and innovation in the country.

A total of EUR 2.95 million was distributed between 2016 and 2019 for 18 research projects on alternative fuels. Table A4: RTD & R shows the list of projects and the amount of public funding granted.

The funding for research and development is also collected in the Climate Change Fund, which specifically addresses research: The use of resources from the Climate Change Fund, which is governed by Article 129 of the Environmental Protection Act, also includes a provision that the revenues generated by the auctioning of emissions allowances is also to be used to fund R & D and demonstration projects to reduce emissions and adapt to climate change, including through participation in the initiatives of the European Strategic Energy Technology Plan and the European Technology Platforms. In the future it is envisaged to mobilise the resources of the Climate Change Fund to support alternative fuels research, technological development and demonstration activities, particularly in the field of hydrogen technologies.

Table A.4:RTD&D

No.	DENOMINATION	DESCRIPTION	AF FIELD	ALTERNATIVE FUEL	TRANSPORT MODE	CURRENT AND PAST ANNUAL BUDGET [k€]				FUTURE ESTIMATED BUDGET [k€]		
						2016	2017	2018	2019	2020	2021-2025	2026-2030
1	RIA	Strength of hydrogen bond around nonpolar solutes: origin of the hydrophobic phenomenon	Combination	Hydrogen	Combination	81	82	86				
2	RIA	Direct conversion of methane to higher hydrocarbons using super-acid catalysts	AF	LNG (incl. Biomethane)	Combination	81	82	87				
3	RIA	Multifunctional materials for actuators and refrigeration	Combination	Electricity	Combination	20	21	22				
4	IA	Development of an integrated catalytic process for energy enrichment of bio-oil obtained by pyrolysis of substrates from renewable sources	AF	Biofuel	Combination	180	10					
5	IA	Usage of original lignocellulosic biofuels for cogeneration of electricity and heat	AF	Biofuel	Combination	6						
6	RIA	Separation and other processes for reducing greenhouse gases based on the principles of sustainable development	Combination	Synthetic & paraffinic fuels	Combination	35						
7	RIA	Chemistry for sustainable development	Combination	Synthetic & paraffinic fuels	Combination	93	224	140	140	140		

8	RIA	Structure and thermodynamics of liquids with hydrogen bonds: water and water-alcohol mixtures	Combination	Hydrogen	Combination	340	35	36	36	36		
9	RIA	Redox active organic materials for the storage of electricity	Combination	Electricity	Combination		54	54	54	54		
10	RIA	Metal-organic porous materials for the selective storage and conversion of CO2 into usable products	Combination	Synthetic & paraffinic fuels	Combination		57	82	82	82		
11	IA	Designing sustainable and energy-efficient renewable energy based processes	Combination	Biofuel	Combination		5	6				
12	IA	Nanostructures and their composites for the detection of dangerous molecules in the gas state	AF	Synthetic & paraffinic fuels	Combination		39					
13	IA	Forecasting the state of depletion of electrochemical energy systems	Combination	Electricity	Combination		82	87				
14	IA	Evaluation of the range of plasma parameters suitable for industrial nanostructuring of polymers	Combination	Synthetic & paraffinic fuels	Combination		38	60				
15	IA	ADVANCED ELECTROCALORIC ENERGY CONVERSION	Combination	Electricity	Combination		31	33				
16	RIA	Separation and other processes for a low carbon, bio and circular economy and sustainable development	Combination	Biofuel	Combination		37	39	39	39		

17	RIA	Ferroelectric Ceramic Layer Elements with Designed Domain Structure for Efficient Energy Collection and Conversion	Combination	Electricity	Combination			82	82	82		
18	RIA	Multistage synthesis with MIO enzymes in a continuous microreactor system	Combination	Biofuel	Combination			34	34	34		
Total projects						837	798	848	468	468		
	RIA, IA, CSA	Combination	Combination	Combination	Combination				150	150	5,000	5,000
	RIA, IA, CSA	Combination	Combination	Combination	Combination				150	150	5,000	5,000
	RIA, IA, CSA	Combination	Combination	Combination	Combination				150	150	5,000	5,000
Remarks: RIA: research and innovation action, IA: innovation action, CSA: coordination and support action									918	918	15,000	15,000

5. OBJECTIVES FOR THE DEVELOPMENT OF ALTERNATIVE FUELS IN TRANSPORT IN SLOVENIA

The strategy for developing the market for deploying the necessary infrastructure related to alternative fuels in the transport sector (hereinafter 'the Strategy') took into account objectives that were in line with Slovenia's commitments under Directive 2014/94/EU, OP GHG 2020 and 2030, and concerning air pollutant targets. The Transport Development Strategy (TDS) and the latest European strategy on low-emission mobility have also been taken into account.

The scenario for meeting the indicative objectives of the OP GHG was selected by reconciling three initial scenarios:

- zero (what happens if we do not take action in this field);
- basic (what can realistically be achieved in this area in Slovenia); and
- intensive (what we would need to do to achieve the objectives in the field of GHG according to the EC proposal on the Slovenian Energy Concept).

The scenario selected was a supplemented basic scenario, which was defined as the optimal scenario and enabled the realisation of the indicative objectives from the OP GHG and reductions in the emissions of air pollutants, on the basis of current developments in this area and potential realisation, taking into account real opportunities of economic entities in this area and expected market development. The optimal scenario provides for the use of all alternative fuels to reduce emissions, in accordance with the indicative objectives in the OP GHG.

Vehicle mix required to realise objectives

To attain the objectives related to the process of decarbonising transport in Slovenia and meet the indicative objectives of the OP GHG and the commitments accepted by Slovenia under international treaties and EU laws, the vehicle mix in Slovenia will need to change in coming years. The share of passenger and commercial vehicles and buses powered by alternative fuel will have to increase markedly. This will put in practice the vision of an ever higher share of passenger kilometres and traffic volume by commercial vehicles being carried out by alternative fuel vehicles. These will need and increasingly make use of recharging infrastructure for alternative fuel, which Slovenia will have to deploy in accordance with the Directive. A sufficient number of alternative fuel vehicles will give rise to sustainable operating models for managing the infrastructure.

The Strategy defines the optimal scenario of the **road transport** vehicle fleet for four categories of vehicles:

- passenger cars (a forecast increase in the share of passenger cars powered by alternative fuel or alternative power on the total Slovenian car fleet of 20 % by 2030).
- light commercial vehicles (it forecasts that, by 2030, the share of the Slovenian fleet of light commercial vehicles running on alternative fuels will increase to 13.5 % by 2030).
- buses (it forecasts that the share of alternatively fuelled buses in the overall fleet of buses will increase to 41.25% by 2030).
- heavy goods vehicles (it forecasts that proportion of heavy goods vehicles in Slovenia's fleet powered by alternative fuels will increase to 28.1% by 2030).

The structure of the vehicle fleet will change in relation to the first registrations of alternative fuel vehicles.

Table A5a: AFV estimates

TRANSPORT MODE	ALTERNATIVE FUELS VEHICLES (AFV)	CURRENT AND PAST NUMBER OF AFV			NUMBER OF AFV EXPECTED TO BE REGISTERED		
		2016	2017	2018	2020	2025	2030
	ELECTRICITY						
Road	Electric Vehicles, EV (total road)	816	1,357	2,104	11,750	69,972	213,007
	Powered Two Wheelers (PTW)	190	201	202			
	Electric Vehicles, EV (excl. PTW)	626	1,156	1,902	11,750	69,972	213,007
	Electric Passenger Cars (BEV+PHEV)	560	1,089	1,834	11,344	66,687	201,354
	• BEV	449	810	1,326	5,311	40,096	129,690
	• PHEV	111	279	508	6,033	26,591	71,664
	Electric Light Commercial Vehicles	62	64	64	398	3,189	11,020
	• BEV	62	64	64	398	3,189	11,020
	• PHEV	0	0	0	0	0	0
	Electric Heavy Commercial Vehicles	0	0	0	0	32	418
	• BEV	0	0	0	0	14	258
	• PHEV	0	0	0	0	18	160
	Electric Buses and Coaches	4	3	4	8	64	215
	• BEV	4	3	4	8	64	215
• PHEV	0	0	0	0	0	0	
	CNG (including Biomethane)						
Road	CNG Vehicles (total road)	328	421	467	3,030	6,593	9,552
	Powered Two Wheelers						
	CNG Vehicles (excl. PTW)	328	421	467	3,030	6,593	9,552
	CNG Passenger Cars	163	225	244	2,558	5,498	7,688
	CNG Light Commercial Vehicles	73	74	74	74102	232	355
	CNG Heavy Commercial Vehicles	8	39	60	102	232	355
	CNG Buses and Coaches	84	83	89	268	631	1,154
	LNG (including Biomethane)						
Road	LNG Vehicles (total road)	8	8	8	179	1,906	4,337
	Powered Two Wheelers						
	LNG Passenger Cars	0	0	0	0	0	0
	LNG Light Commercial Vehicles	0	0	0	0	0	0
	LNG Heavy Commercial Vehicles	8	8	8	179	1,906	4,337
	LNG Buses and Coaches	0	0	0	0	0	0
	HYDROGEN						
Road	Fuel Cell Vehicles, FCEV (total road)	0	0	0	86	1,240	6,871
	Powered Two Wheelers						
	Hydrogen Passenger Cars	0	0	0	77	1,008	5,559
	Hydrogen Light Commercial Vehicles	0	0	0	7	81	455

	Hydrogen Heavy Commercial Vehicles	0	0	0	0	137	800
	Hydrogen Buses and Coaches	0	0	0	2	14	57
	LPG						
	LPG Vehicles (total road)	9,850	10,423	10,670	33,295	41,145	36,440
	Powered Two Wheelers						
	LPG Passenger Cars	9,468	9,999	10,246	32,789	38,932	31,374
	LPG Light Commercial Vehicles	373	410	410	300	251	224
	LPG Heavy Commercial Vehicles	9	14	14	206	1,962	4,842
	LPG Buses and Coaches	0	0	0	0	0	0

Table A5a: AFV estimates shows the number of all registered vehicles by category and fuel types between 2016 and 2018 and projections of alternative fuel vehicles for the years 2020, 2025 and 2030 as derived from the Strategy.

Electric vehicles (BEV, PHEV)

Statistics show that in 2018 there were 1,326 passenger battery-electric cars (BEV) registered in Slovenia in total; the 2020 Strategy foresees 5,311 electric passenger cars, which represents 25% of the 2020 target. The situation regarding plug-in hybrids (PHEV) is even lower, i.e. 508 in 2018; the 2020 Strategy foresees 6,033, representing 8.4% of the 2020 target. With regard to light commercial vehicles, there is also a significant gap between the 2018 figures and the projections for 2020 (16%). Buses (50%) are doing better in relation to the projection for 2020. As yet, there are no electric heavy goods vehicles registered in Slovenia.

Compressed natural gas (CNG)

In 2018, 244 CNG-powered passenger cars were registered, representing 9.5% of the target for 2020. Light commercial vehicles (74%), heavy goods vehicles (58.8%) and buses (33.2%) are closer to the target for 2020. For buses and coaches, CNG is identified as a key alternative fuel for the achievement of the objectives. This is in line with the obligation under the Directive requiring Slovenia to deploy refuelling infrastructure for CNG in urban areas by 31 December 2020. The Strategy proposal plans for refuelling infrastructure to be deployed in all urban municipalities and in the Zasavje region, as buses powered by CNG offer a real solution for reducing air pollution from traffic.

Liquefied natural gas (LNG)

No vehicles fuelled by LNG other than heavy goods vehicles are yet registered in Slovenia. LNG has been recognised as the most promising solution in international transport, and the share of LNG heavy goods vehicles is forecast to increase. 179 LNG vehicles are expected to be registered in Slovenia in 2020. In 2018, eight such vehicles were registered, representing 4.5% of the 2020 target.

Hydrogen

According to official statistics there are no hydrogen fuel cell passenger cars registered in Slovenia. The forecast for 2020 is for 77 passenger cars, 7 light goods vehicles and 2 buses.

However, it should be noted that the municipality of Velenje, in cooperation with the Šoštanj thermal power plant (TEŠ) and the Kssena Agency, is developing a public passenger transport project using hydrogen buses. In addition to the buses, the project consists of the establishment of a refuelling point

and the upgrading of the electrolysis unit in TEŠ to ensure adequate production capacity for hydrogen. The project is expected to be completed in 2020.

In addition, two further hydrogen projects are in the pipeline. The first, RESHUB, is headed by the Ministry of Defence and is dedicated to the establishment of 15 hydrogen refuelling points in Slovenia. The Slovenian army recognises hydrogen as an energy product ensuring its strategic independence. This is linked to a project of zero emission corridors in Slovenia, which will benefit civilian hydrogen-powered mobility by making available the refuelling points supplying the Slovenian army

Liquefied petroleum Gas (LPG)

LPG is the most common alternative fuel for passenger cars in Slovenia. 10,246 LPG-powered passenger cars were registered in 2018, representing 31.24% of the target for 2020. The number of light commercial vehicles running on LPG should be reduced in line with the Strategy for the years 2020 to 2030. For the time being, according to data from 2016 to 2018, this has not yet been the case. The number of heavy goods vehicles, like passenger cars, is set to increase. 14 LPG-powered heavy goods vehicles were registered in 2018, representing 6.8% of the target for 2020.

The figures for registered alternatively fuelled vehicles in circulation, from 2016 to 2018, show that 2020 targets have remained largely unattained. However, the situation, notably in the area of electromobility, compared to the starting point in 2016, is noticeably improving. The total number of registered electric vehicles in 2018 (1,834) was up by 227.5% over 2016 (560).

Objectives in the field of recharging infrastructure

Meeting the planned number of vehicles powered by alternative fuels in Slovenia and the requirements under Directive 94/2014 will require appropriate recharging infrastructure. Table A.5b: AFI targets shows the actual number of refuelling points per fuel type between 2016 and 2018 and the projections needed to meet the projected Strategy targets for 2020, 2025 and 2030.

Table A5.b: AFI targets

TRANSPORT MODE	ALTERNATIVE FUELS INFRASTRUCTURE (AFI)	CURRENT AND PAST NUMBER OF RECHARGING/REFUELLING POINTS			TARGET NUMBER OF RECHARGING/REFUELLING POINTS		
		2016	2017	2018	2020	2025	2030
	ELECTRICITY						
Road	Total recharging points (public* + private)	228	295	328	1,200	7,000	22,300
	Recharging points (publicly accessible)	228	295	328	1,200	7,000	22,300
	Normal power recharging points, P ≤ 22kW (public)	189	264	297	1,150	6,850	22,000
	High power recharging points, P > 22kW (public)	39	31	31	50	150	300
	• AC fast charging, 22kW < P ≤ 43 kW (public)						
	• DC fast charging, P < 100 kW (public)	39	31	31	50	150	300
	• DC ultrafast charging, P ≥ 100 kW (public)						
	Recharging points (private)	0	0	0	0	0	0

	Normal power recharging points, P ≤ 22kW (private)						
	High power recharging points, P > 22kW (private)						
	• AC fast charging, 22kW < P ≤ 43 kW (private)						
	• DC fast charging, P < 100 kW (private)						
	• DC ultrafast charging, P ≥ 100 kW (private)						
	NATURAL GAS (including Biomethane)						
Road	CNG refuelling points (total)	4	4	4	14	14	14
	CNG refuelling points (public)	4	4	4	14	14	14
	CNG refuelling points (private fleet operators)						
	LNG refuelling points (total)	0	1	1	3	3	3
	LNG refuelling points (public)	0	1	1	3	3	3
	LNG refuelling points (private fleet operators)						
	HYDROGEN						
Road	H₂ refuelling points (total)	1	1	1	2	7	7
	H ₂ refuelling points – 350 bar (total)	1	1	1	1	5	5
	H ₂ refuelling points – 350 bar (public)	1	1	1	1	5	5
	H ₂ refuelling points – 350 bar (private fleet operators)						
	H ₂ refuelling points – 700 bar (total)	0	0	0	1	2	2
	H ₂ refuelling points – 700 bar (public)	0	0	0	1	2	2
	H ₂ refuelling points – 700 bar (private fleet operators)						
	LPG						
Road	LPG refuelling points (total)	115	115	115	0	0	0
	LPG refuelling points (public)	115	115	115			
	LPG refuelling points (private fleet operators)						

6. ALTERNATIVE FUELS INFRASTRUCTURE DEVELOPMENTS

In line with the objectives of the Strategy, the development of recharging/refuelling infrastructure for alternative fuels is to run in parallel with the increasing number of alternatively powered vehicles. The strategy provides for the development of charging/refuelling infrastructure for electric battery-powered vehicles and plug-in hybrids (PHEV), and hydrogen fuel cell, CNG and LNG vehicles.

Infrastructure for electro-mobility

The charging infrastructure for electric vehicles in Slovenia offers relatively good coverage given the number of such vehicles on Slovenian roads; this is particularly true for the TEN-T Road Core Network comprising 31 fast charging stations for electric vehicles. As well as allowing Slovenian users to use electric vehicles reliably, the network allows for the reliable circulation of electric vehicles within the EU. Slovenia has already met this criterion under Directive 2014/94/EU.

In 2018, there were a total of 328 electric charging stations in Slovenia, of which 31 were high-speed e-chargers with a power of 43-50 kW on the motorway network. Slovenia will keep the number of recharging points in the right proportion to the number of electric vehicles, i.e. one public recharging point per ten vehicles. In 2018, this ratio was **1:6** (Table A.6: AFI developments).

With bigger concentrations in cities and larger urban agglomerations, recharging infrastructure for electric vehicles is not evenly distributed across the whole country. There are many more recharging points in Ljubljana than in other locations. However, the project Zelena Keltika, a system of electric recharging points, was installed in 2016, allowing electric vehicles to be used across the whole northern Primorska region. Recharging infrastructure will also have to be installed in other areas of Slovenia where there is no connection to this system.

The *Gremo na elektriko* (Let's go electric) website, which is the largest Slovenian online search engine for electric charging stations, operated by Elektro Ljubljana, was upgraded in 2019. According to the data available on the website, the number of charging stations in the largest Slovenian towns with more than 10,000 inhabitants, in 2019 is as follows (the total number of charging stations in 2019 in Slovenia was 319): Ljubljana – **84**, Maribor – 10, Celje – 14, Kranj – 3, Koper – 11, Velenje – 2, Novo Mesto – 11, Ptuj – 1, Trbovlje – 4, Kamnik – 7, Nova Gorica - 3, Jesenice – 3, Domžale – 1, Škofja Loka – 1, Izola – 1, Murska Sobota – 5.

Compressed natural gas (CNG) infrastructure

In accordance with the Directive, there are two important milestones in introducing compressed natural gas in transport in Slovenia:

By 31 December 2020: Slovenia must have deployed a suitable number of publicly accessible refuelling points for CNG in order for motor vehicles powered by CNG to drive in dense urban/pre-urban agglomerations and in other populated areas, in accordance with indent 6 of Article 3(1). This also meets the objective of deploying infrastructure for alternative fuel for public passenger transport services, and for vehicles used for municipal and other urban activities.

By 31 December 2025: a network of publicly accessible refuelling points for CNG must be deployed on the TEN-T core network, which is on Slovenia's motorways along the pan-European corridors X and V. Slovenia will have to deploy five recharging points for CNG on the motorway network by this date to ensure smooth transport with neighbouring States.

In 2018, there were four CNG refuelling points in Slovenia in three locations: two in Ljubljana, one in Maribor and one in Jesenice. In 2019, the fifth public refuelling station for CNG vehicles was set up in the Municipality of Celje with two refuelling points (Table A.6: AFI developments) show the ratio between the number of CNG vehicles and the number of refuelling stations. In 2020, there are plans to establish recharging/refuelling infrastructure in other Slovenian cities in line with the Directive.

Liquefied natural gas (LNG) infrastructure

In accordance with Directive EU/2014/94, Slovenia must, along with other EU Member States, deploy a network of publicly accessible LNG refuelling points for heavy-duty vehicles, at least on the existing

TEN-T core network. This must match the lowest range of heavy-duty LNG-powered vehicles, which means that the average distance between refuelling points can be around 400 km.

An appropriate number of publicly accessible LNG refuelling points must be deployed on the existing TEN-T core network by 31 December 2025, and subsequently on other parts of the TEN-T network.

By 31 December 2025, an adequate number of LNG refuelling points must be deployed at ports to allow for the movement of vessels powered by LNG in the entire TEN-T core network. In Slovenia, this obligation relates to the Port of Koper.

The first LNG refuelling station in Slovenia for heavy goods vehicles was set up at the end of 2017 in Ljubljana. In 2020 it is expected that a total of three LNG refuelling stations will be located in Slovenia and on the core network.

Hydrogen infrastructure

Since 2013 there has been a public hydrogen refuelling point in Lesce, Slovenia, operating at a pressure up to 350 bar. Slovenia will promote the development of hydrogen technologies and, in line with the objectives of the Strategy, establish a public refuelling infrastructure for hydrogen. The plan is to establish a public hydrogen refuelling station in the municipality of Velenje in 2020 which, in addition to the refuelling of buses at a pressure of 350 bar, will also allow the refuelling of passenger cars at a pressure of 700 bar.

Liquefied petroleum gas (LPG) infrastructure

Liquefied petroleum gas has a particular position and role as an alternative fuel in Slovenia. Refuelling infrastructure has been deployed to a satisfactory extent; users trust it and are using it. In comparison with petrol vehicles, LPG vehicles use less energy and have around 14% less emissions. The effect of converting a thousand petrol engine vehicles to LPG use is equivalent to that of 142 electric vehicles, based on the assumption they drive the same number of kilometres and have constant use. The effect on reducing GHG emissions in transport in Slovenia from seven LPG powered vehicles is the same as from one electric vehicle.

No subsidies are planned to promote LPG use, whether for recharging infrastructure, which is adequate, or for the vehicles, because the extra cost is recovered in the lower cost of operation within three years. That is why there is no provision in the Strategy for the development of refuelling infrastructure using public funds.

Shore-side supply of electricity to seagoing ships

The Directive provides that Member States must identify ports where it will be possible to supply berthed seagoing ships with electricity and LNG. In Slovenia the Port of Koper is the only port of this kind.

Shore-side electricity supply for seagoing ships, including the design, installation and testing of the systems, must comply with the technical specifications of the IEC/ISO/IEEE 80005-1 standard.

In accordance with the Directive, seagoing ships must be supplied with electricity from the shore-side by 31 December 2025 unless there is no demand for such a service or the costs are greater than the benefits (including the environmental benefits) or are disproportionately high. The Port of Koper is already preparing the first assessment on the suitability of the existing distribution network for the purposes of supplying electricity to berthed seagoing ships. It was found that upgrading and strengthening the network would require a relatively large investment.

The existing electricity network in the Port of Koper is connected to the electricity network through the 20 kV distribution network. The current use at the port is around 10 MW, which is assessed as still being an acceptable connected load for the distribution network. By expanding the port and with new investments into the infrastructure (without berthing seagoing ships), the use is planned to increase to 25 MW by 2030. At the same time, we have determined that by 2025 the peak power involved in ships connecting to the electricity would be 50 MW, since the connected load of a passenger ship itself

exceeds 10 MW. This assessment takes into account the concurrency factor, as it may also be necessary to supply cargo ships with electricity while berthed at the port.

Because of the limitations of the distribution network, it will not be possible to provide adequate electrical power to supply ships at the same time as providing enough for the increased demand for electricity inside the port. To this end, as part of the European project POSEIDON-MED, a document titled 'Feasibility of connecting the Port of Koper to the 110 kV network' was prepared, which discusses in detail the technical solutions for connecting the 'RTP 110/20 kV Luka Koper' distribution transformer station to the 2x110 kV power line on the transmission electricity system of Slovenia. Measures are planned to build new power lines to connect to the 110 kV transmission network in order to realise objectives linked to supplying ships with electricity from the shore-side for the needs of the Port of Koper and to assess how much to charge for electricity to supply ships from the shore-side.

Supply of stationary aircraft with electric power

Slovenia must supply electricity to stationary aircraft by 31 December 2025. At Jože Pučnik airport, Brnik, this requirement has been met because all stationary aircraft already have a supply of electric power. At Maribor and Portorož airports the supply will be in place by the planned deadline.

Table A.6: AFI developments

		PAST									FUTURE ESTIMATED								
		2016			2017			2018			2020			2025			2030		
MODE OF TRANSP	ALTERNATIVE FUEL	Supply	Demand	Ratio	Supply	Demand	Ratio	Supply	Demand	Ratio	Supply	Demand	Ratio	Supply	Demand	Ratio	Supply	Demand	Ratio
	Electricity	228	626	3	295	1156	4	328	1902	6	1200	11750	10	7000	69972	10	22300	213007	10
Road	CNG (incl. Biome	4	328	82	4	421	105	4	467	117	14	3030	216	14	6593	471	14	9552	682