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Ministère de la Mobilité
et des Travaux publics

Département de la mobilité
et des transports

National policy framework for the development of alternative fuels infrastructure in the transport sector

2019

adopted under Directive 2014/94/EU of 22 October 2014 on the deployment of alternative fuels infrastructure

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Ministry of Mobility and Public Works
4, Place de l'Europe
L-1499 Luxembourg

Tel.: (+352) 247 - 84400
Fax: (+352) 22 85 68
Email: info@tr.etat.lu
www.transports.lu

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GLOSSARY

AVL	Autobus de la Ville de Luxembourg [Luxembourg City Buses]
BEV	Battery Electric Vehicle
EAFO	European Alternative Fuels Observatory
EV	Electric Vehicle
FCEV	Fuel Cell Electric Vehicle
CNG	Compressed Natural Gas
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
DSO	Distribution System Operator
ILR	Institut Luxembourgeois de Régulation [Luxembourg Regulatory Authority]
ITS	Intelligent Transport Systems
LIST	Luxembourg Institute of Science and Technology
MDDI	Ministry of Sustainable Development and Infrastructure [Ministère du Développement Durable et des Infrastructures]
MMTP	Ministry of Mobility and Transport [Ministère de la Mobilité et des Transports]
NECP	National Energy and Climate Plan
NEDC	New European Driving Cycle
P+R	Park-and-ride facilities
PHEV	Plug-in Hybrid Electric Vehicle
RGTR	Régime général des transports routiers [Luxembourg Road Transport System]
RTD&D	Research, Technological Development and Demonstration
TEN-T	Trans-European Transport Network
SNCA	Société Nationale de Circulation Automobile [National Agency for Automobile Traffic]
STATEC	Institut national de la statistique et des études économiques [National Institute for Statistics and Economic Studies]
TICE	Transport Intercommunal de Personnes dans le Canton d'Esch-sur-Alzette [Inter-Municipal Passenger Transport in the Canton of Esch-sur-Alzette]
WLTP	Worldwide Harmonised Light Vehicle Test Procedure

Background

The European Council of March 2007 made a firm commitment to a 20% reduction in the European Union's overall greenhouse gas (GHG) emissions by 2020 as compared to 1990 levels. As part of that commitment, under Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009, Luxembourg was given the objective of reducing its GHG emissions by 20% as compared to 2005 levels.

In line with this overall objective, the European Union is pursuing a transport policy aimed at reducing GHG emissions, reducing its dependence on oil and increasing the share of energy from renewable sources:

- Directive 2009/28/EC sets a 10% market share target for energy from renewable sources in transport by 2020;

- in its White Paper of 28 March 2011, the Commission advocates the development of competitive, resource-efficient and clean transport in order to meet the objective of a 60% reduction in GHG emissions from transport by 2050 as compared to 1990 levels;

  in the Commission Communication of 24 January 2013 entitled 'Clean power for transport: a European alternative fuels strategy', electricity, natural gas in gaseous form (compressed natural gas – CNG) or liquefied form (liquefied natural gas – LNG), hydrogen, biofuels and liquefied petroleum gas (LPG) are identified as the main alternative fuels currently able to replace oil in the long term.

Based on the above, Directive 2014/94/EU of 22 October 2014 'establishes a common framework of measures for the deployment of alternative fuels infrastructure in the Union in order to minimise dependence on oil and to mitigate the environmental impact of transport'.

The Directive focuses on six types of alternative fuel:

- electricity,
- natural gas, including biomethane, in the form of CNG and LNG,
- hydrogen,
- biofuels as defined in Directive 2009/28/EC,
- synthetic and paraffinic fuels,
- liquefied petroleum gas.

The Directive lays down minimum requirements for the deployment of alternative fuels infrastructure, which must be put in place by each Member State by means of a national policy framework to be notified to the Commission by 18 November 2016. These requirements only apply to electricity, natural gas and hydrogen, and vary in strictness depending on the type of alternative fuel. The precise requirements as laid down in the Directive and the national objectives set by Luxembourg in order to meet them are listed in Section 2.

Annex II to the Directive lays down minimum technical specifications for these three types of alternative fuel, with which future supply infrastructure must comply.

Finally, Article 3 of the Directive sets out the minimum content of the national policy framework that each Member State must adopt and notify to the Commission. This includes in particular:

- an assessment of the current state and future development of the market as regards alternative fuels in the transport sector;
- targets for deploying publicly accessible infrastructure to supply vehicles with electricity, natural gas and, where appropriate, hydrogen;
- measures for reaching those targets.

Luxembourg's first national policy framework for the development of alternative fuels infrastructure in the transport sector was published by the Department of Transport of the Ministry of Sustainable Development and Infrastructure (*Ministère du Développement Durable et des Infrastructures* – MDDI) and submitted to the Commission on 31 October 2016.

Each Member State must submit to the Commission a report on the implementation of its national policy framework by 18 November 2019, and every three years thereafter. Those reports must 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.

Accordingly, this document contains an update of the initial 2016 national policy framework and will be revised every three years. As the Department of Mobility and Transport has been part of the Ministry of Mobility and Public Works since the end of 2018, this document has been adopted by the latter.

Furthermore, this national policy framework is limited to the following three types of alternative fuel: electricity, CNG, LNG and hydrogen. The respective figures on registered vehicles and existing infrastructure are not therefore given for the other alternative fuels defined by Directive 2014/94/EU of 22 October 2014. Moreover, as regards hydrogen and in accordance with the Directive, the government has decided not to include, at this stage, targets for hydrogen refuelling points or the number of vehicles registered.

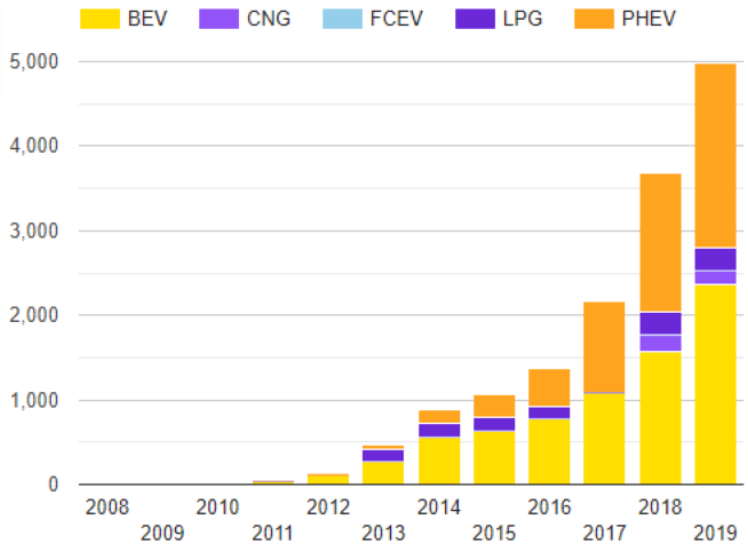
1. State of the alternative fuels market in Luxembourg

1.1. Percentage use of alternative fuel vehicles

At the end of 2019, alternative fuel vehicles still played only a minor role in the fuel mix in Luxembourg. The number of other alternative fuel vehicles, as defined by Directive 2014/94/EU, continued to represent only a small proportion of the total fleet of around 460,000 vehicles (categories M1 and N1) registered in Luxembourg.

Since 2017, however, there has been a considerable increase in the number of plug-in electric cars (EV). For example, at the end of 2019, the 2,195 battery electric cars (BEV) registered accounted for approximately 0.5% of all registered vehicles. In addition, there were 2,640 plug-in hybrid electric cars (PHEV) representing a percentage of 0.61%. This means that, at the end of 2019, 1.1% of all motor vehicles were plug-in electric cars.

Alternative fuel cars registered in Luxembourg, EAFO ([1])



In the case of CNG vehicles, the total number has been falling sharply, with these vehicles accounting for only 0.05% of all motor vehicles at the end of 2019. At the same time, no fuel cell electric vehicles (FCEV) have been registered and there are only 18 registered LNG vehicles.

[1] EAFO, Alternative fuel cars registered in Luxembourg https://www.eafo.eu/countries/luxembourg/1743/vehicles-and-fleet

1.2. Number of registered alternative fuel vehicles

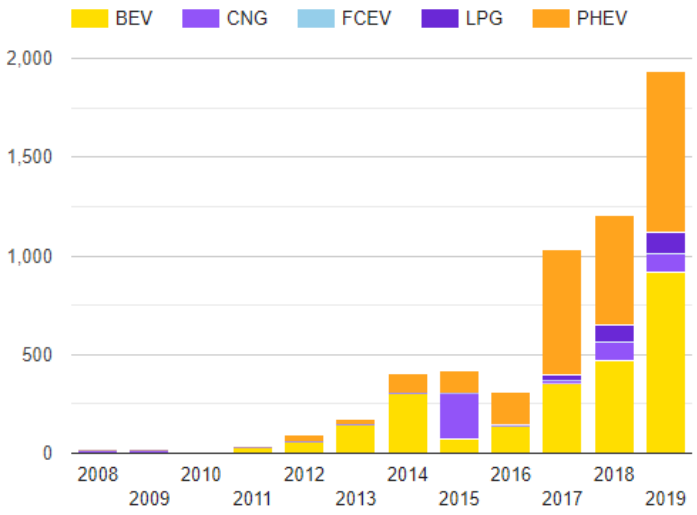
At the end of 2019, out of an approximate total of 560,000 registered motor vehicles, the following numbers of alternative fuel vehicles were registered with the National Agency for Automobile Traffic (*Société Nationale de Circulation Automobile* – SNCA):

Table 1-1: Alternative fuel vehicles registered at the end of 2019

	2016	**2017**	**2018**	**2019**
Electric vehicles (EV)	**1,468**	**2,698**	**3,861**	**5,888**
CNG vehicles	294	322	314	267
LNG vehicles	1	6	13	18
FCEV	0	0	0	0
Total	**1,763**	**3,026**	**4,188**	**6,173**

Following a fall in 2016, registrations of alternative fuel vehicles have increased since 2017, particularly for battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV).

New registrations of alternative fuel cars in Luxembourg, EAFO ([2])



The following sections describe the state of play with the various categories of registered vehicles and the recharging or refuelling infrastructure for electricity, CNG, LNG and hydrogen.

[2] EAFO, New registrations of AFV in Luxembourg, https://www.eafo.eu/countries/luxembourg/1743/vehicles-and-fleet

1.3. Electricity

As mentioned in the previous section, since 2017 registrations of electric vehicles have been on the increase, particularly for battery electric and plug-in hybrid electric passenger cars (category M1). The number of battery electric buses has also increased significantly in recent years. For example, only two such vehicles were registered at the end of 2016, whereas, at the end of 2019, 108 battery electric buses were being used on the roads of the Grand Duchy.

Table 1-2: Electric vehicles registered in Luxembourg

	2016	2017	2018	2019
Electric vehicles	**1,468**	**2,698**	**3,861**	**5,888**
Electric two and three wheelers and quadricycles (PTW)	**350**	**420**	**488**	**663**
Electric vehicles (excl. PTW)	**1,118**	**2,278**	**3,373**	**5,225**
Passenger cars (BEV+PHEV)	1,003	2,104	3,118	4,835
• BEV	627	996	1,360	2,195
• PHEV	376	1,108	1,758	2,640
Vans (BEV+PHEV)	110	152	192	250
• BEV	110	152	192	250
• PHEV	0	0	0	0
Lorries (BEV+PHEV)	3	3	8	9
• BEV	3	3	8	9
• PHEV	0	0	0	0
Buses and coaches (BEV+PHEV)	2	19	55	131
• BEV	2	7	33	108
• PHEV	0	12	22	23

At the end of 2019, there were nearly 1,000 publicly accessible recharging points in Luxembourg. The majority of these were normal power recharging points, with only a few being high power recharging points. On the basis that 5,225 plug-in electric cars and vans were registered at the end of 2019 in Luxembourg, this corresponds to one publicly accessible recharging point for every 5.43 plug-in electric cars and vans. Given that, in the first national policy framework in 2016, this ratio was 5.49 electric vehicles per publicly accessible recharging point, we can conclude that the recharging infrastructure has expanded since 2016 to the same extent as the number of plug-in electric vehicles.

Table 1-3: Existing recharging points

	2016	2017	2018	2019
Publicly accessible recharging points	**212**	**337**	**841**	**962**
Normal power recharging points, P ≤ 22 kW (public)	202	327	831	949
High power recharging points, P > 22 kW (public)	10	10	10	13
• AC fast charging, 22 kW < P ≤ 43 kW (public)	1	1	1	2
• DC rapid charging, P < 100 kW (public)	9	9	9	11
• DC ultra-rapid charging, P ≥ 100 kW (public)	0	0	0	0

As for non-publicly accessible recharging points, an inventory has not yet been drawn up. However, residential recharging facilities and devices for electric cars, with a single-phase power in excess of 4.6 kW or a three-phase power of 7 kW or more, must be declared to the DSO from the start of 2020. An initial inventory of non-publicly accessible recharging points will therefore be available by the next national policy framework.

With regard to electricity supplies for stationary aircraft, Luxembourg airport, which is part of the TEN-T Core Network, now has 28 electricity supplies (GPUs or Ground Power Units: diesel engines coupled to generators) for stationary aircraft: P7/P10 cargo aprons, P1 passenger apron (Terminal A/B). Furthermore, at the P7 apron at Luxembourg Airport, Luxair Cargo has 16 additional units to power stationary aircraft. Other operators (e.g. Cargolux Maintenance, Luxair Maintenance and Luxembourg Air Rescue) have fixed or mobile units that are not listed in Table 1-4.

Table 1-4: Existing electricity supplies at airports

	2016	2017	2018	2019
Electricity supplies for stationary aircraft	**24**	**44**	**44**	**44**

Currently, the inland port at Mertert does not have any shore-side electricity supply infrastructure for inland waterway vessels. However, as regards inland waterway infrastructure, it should be noted that the Wasserbillig, Grevenmacher, Wormeldange, Remich, Bech-Kleinmacher and Schengen docks on the Moselle are equipped with electricity supply terminals (230V + 400V) and electrical panels. Since September 2019, the electricity supply at Grevenmacher has been improved so that it can accommodate and serve cruise ships with a high power connector (400V/400A Powerlock connector).

Table 1-5: Existing electricity supplies at ports and docks

	2016	2017	2018	2019
Shore-side electricity supplies at ports (terminals)	**0**	**2**	**5**	**5**

1.4. Natural gas

The number of CNG or petrol/CNG passenger cars, vans and lorries registered in Luxembourg remains low and has fallen since 2017. Only the number of CNG buses and coaches has increased since 2016. This is wholly due to the bus operator *Transport Intercommunal de Personnes dans le Canton d'Esch-sur-Alzette* (TICE) in the south-west of the country, which has a fleet of 55 CNG coaches.

Table 1-6: CNG vehicles registered in Luxembourg

	2016	2017	2018	2019
CNG vehicles	**294**	**322**	**314**	**267**
CNG two and three wheelers and quadricycles (PTW)	**0**	**0**	**0**	**0**
CNG vehicles (excl. PTW)	**294**	**322**	**314**	**267**
CNG passenger cars	189	204	195	167
CNG vans	61	66	56	39
CNG lorries	0	0	11	6
CNG buses and coaches	44	52	52	55

In 2016 there was a well-developed distribution infrastructure, with six publicly accessible CNG refuelling stations. As these stations served only a fleet of around 300 CNG vehicles, this infrastructure was regarded as oversized and unprofitable by its operators, which led to the closure of four refuelling stations in 2019. The TICE bus operator has a gas compressor station for buses, which is not accessible to the public, at its site in Esch-sur-Alzette. It is particularly important to mention that these buses are exclusively supplied with biogas.

Table 1-7: Existing CNG refuelling points

	2016	2017	2018	2019
CNG refuelling points (total)	**7**	**7**	**3**	**3**
CNG refuelling points (public)	6	6	2	2
CNG refuelling points (private)	1	1	1	1

As regards liquefied natural gas (LNG), there are only LNG lorries registered in Luxembourg.

Table 1-8: LNG vehicles registered in Luxembourg

	2016	2017	2018	2019
LNG vehicles	**1**	**6**	**13**	**18**
LNG two wheelers	**0**	**0**	**0**	**0**
LNG passenger cars	0	0	0	0
LNG vans	0	0	0	0
LNG lorries	1	6	13	18
LNG buses and coaches	0	0	0	0

There is currently no public infrastructure for refuelling, either for road transport or for inland waterway transport. Only private infrastructure has been operational since 2016.

As regards road transport, none of the six corridors identified by the various parties involved in the LNG Blue Corridor pass through Luxembourg. No LNG refuelling stations are therefore planned as part of this initiative.

Table 1-9: Existing LNG refuelling points for road vehicles

	2016	2017	2018	2019
LNG refuelling points (total)	**1**	**1**	**1**	**1**
LNG refuelling points (public)	0	0	0	0
LNG refuelling points (private)	1	1	1	1

As regards inland waterway transport, no specific facilities are planned for the Moselle in the context of the LNG Masterplan, although the Moselle is one of the tributaries of the main rivers (Rhine, Main, Meuse, Danube) included in this project.

Table 1-10: Existing LNG refuelling points for vessels

	2016	2017	2018	2019
Maritime ports – LNG refuelling points	/	/	/	/
Inland ports – LNG refuelling points	0	0	0	0

1.5. Hydrogen

There are currently no fuel cell electric vehicles (FCEV) registered in Luxembourg.

Table 1-11: FCEV registered in Luxembourg

	2016	2017	2018	2019
FCEV	**0**	**0**	**0**	**0**
FCEV two wheelers	**0**	**0**	**0**	**0**
FCEV passenger cars	0	0	0	0
FCEV vans	0	0	0	0
FCEV lorries	0	0	0	0
FCEV buses and coaches	0	0	0	0

This is mainly due to the fact that there are currently no public or private hydrogen refuelling points operating in Luxembourg and that the nearest refuelling station is around 100 km from the country's border. Between 2004 and 2006, Luxembourg City was part of a hydrogen bus project, which is why it installed a hydrogen station in Hollerich. This station is no longer operating.

Table 1-12: Existing hydrogen refuelling points

	2016	2017	2018	2019
H2 refuelling points (total)	**0**	**0**	**0**	**0**
H2 refuelling points – 350 bar (total)	0	0	0	0
H2 refuelling points – 350 bar (public)	0	0	0	0
H2 refuelling points – 350 bar (private)	0	0	0	0
H2 refuelling points – 700 bar (total)	0	0	0	0
H2 refuelling points – 700 bar (public)	0	0	0	0
H2 refuelling points – 700 bar (private)	0	0	0	0

2. National targets and objectives

Directive 2014/94/EU sets out minimum requirements for the building-up of alternative fuels infrastructure. These requirements only apply to electricity, natural gas and hydrogen, and vary in strictness depending on the type of alternative fuel.

For electricity, Article 4 states that 'Member States shall ensure, by means of their national policy frameworks, that an appropriate number of recharging points accessible to the public are put in place by 31 December 2020'. As a guide, it refers to one recharging point accessible to the public for every ten electric vehicles.

For natural gas, Article 6 similarly states that:

- 'Member States shall ensure, by means of their national policy frameworks, that an appropriate number of CNG refuelling points accessible to the public are put in place by 31 December 2020, in order to ensure … that CNG motor vehicles can circulate in urban/suburban agglomerations and other densely populated areas, and, where appropriate, within networks determined by the Member States'. As a guide, it refers to an average distance of 150 km between refuelling points.
- 'Member States shall ensure, by means of their national policy frameworks, that an appropriate number of CNG refuelling points accessible to the public are put in place by 31 December 2025, at least along the existing TEN-T Core Network, to ensure that CNG motor vehicles can circulate throughout the Union.'
- 'Member States shall ensure, by means of their national policy frameworks, that an appropriate number of refuelling points for LNG accessible to the public are put in place by 31 December 2025, at least along the existing TEN-T Core Network, in order to ensure that LNG heavy-duty motor vehicles can circulate throughout the Union, where there is demand, unless the costs are disproportionate to the benefits, including environmental benefits'. As a guide, it refers to an average distance of 400 km between refuelling points.
- 'Member States shall ensure, by means of their national policy frameworks, that an appropriate number of refuelling points for LNG are put in place at inland ports, to enable LNG inland waterway vessels or sea-going ships to circulate throughout the TEN-T Core Network by 31 December 2030.'

For hydrogen, Article 5 leaves Member States to decide whether or not to include hydrogen refuelling points accessible to the public for road transport in their national policy frameworks, stating that, if they do so, they 'shall ensure that, by 31 December 2025, an appropriate number of such points are available, to ensure the circulation of hydrogen-powered motor vehicles, including fuel cell vehicles,

within networks determined by those Member States, including, where appropriate, cross-border links'. In view of the complexity of setting national targets for the various alternative fuels, the MMTP simply refers to the minimum requirements listed in Directive 2014/94/EU. This version of the national policy framework therefore lists targets only for electromobility and natural gas. For other alternative fuels such as hydrogen, only existing projects are listed without the associated figures being considered as targets.

2.1. Envisaged importance of the various alternative fuels

Based on the state of existing fuel infrastructure, planned investment projects, and outlooks and trends in the transport sector, Luxembourg has assessed the number of alternative fuel vehicles expected for 2020, 2025 and 2030. Within the future mix of alternative fuel vehicles, different types of technology will need to be promoted depending on the type of vehicle and its use.

The government does not generally favour just one alternative fuel and has therefore adopted a technologically neutral policy. Each alternative fuel can help to make road transport cleaner provided that this technology helps to achieve the government's climate protection and air quality objectives.

For example, if the production of hydrogen by electrolysis using electricity generated solely from renewable energy becomes competitive, fuel cell electric vehicles could play a major role.

With this in mind, the government stated, in its coalition agreement 2018-2023 ([3]), that 'tomorrow's mobility will be electric' and that 'efforts will continue to make Luxembourg, together with other pioneering countries such as Norway, the Netherlands and Portugal, one of the main players in electric mobility'. The development of electric vehicles is key to Luxembourg meeting its CO_2 emission reduction targets. As indicated in a technical and economic study ([4]), electric mobility is a type of technology that must be promoted, particularly for private and commercial vehicles. The average distance travelled is only 39 km per day ([5]) and all electric cars on the market already have such a range. Furthermore, for commercial vehicles and buses operating in urban and suburban environments, electric mobility remains the most viable alternative for the future.

Natural gas had been considered a type of transition technology for decarbonising the transport sector. As a result, significant CNG refuelling infrastructure was rolled out (see Section 1.4). However, due to

[3] https://gouvernement.lu/dam-assets/documents/actualites/2018/12-decembre/Accord-de-coalition-2018-2023.pdf, Coalition agreement 2018-2013, Luxembourg Government, December 2018.

[4] *Etude technico-économique pour la mise en œuvre nationale de l'électromobilité au Luxembourg* (Technical and economic study on the national roll-out of electromobility in Luxembourg), December 2011.

[5] Modu 2.0 strategy, www.modu2.lu, May 2018.

low use of CNG stations, limited interest in particular among private customers and the anticipated growth in electric mobility, the future role of natural gas in the transport sector has been re-assessed. The government believes that CNG will play only a marginal role and that, as a result, it is more important to focus on promoting electric mobility. This view has been confirmed by discussions and work carried out as part of the Third Industrial Revolution Strategy Study in Luxembourg ([6]), which has also identified electromobility as the path to be followed for decarbonising the transport sector. The importance of the future role of LNG remains to be determined. Given that viable alternatives to diesel vehicles for long-distance river or road freight transport are currently limited, LNG could act as a type of transition technology for decarbonising this sector. It remains to be seen whether other technologies that are regarded as cleaner could soon result in the role of LNG being limited.

Hydrogen propulsion technology is not regarded as sufficiently developed at present. There is continued hope that hydrogen will be one of the main solutions in future mobility as no CO_2 is emitted when producing hydrogen by electrolysis where carbon-free electricity is used. The main disadvantages of hydrogen that are currently hindering its development are the high and therefore uncompetitive costs of carbon-free hydrogen production, distribution infrastructure and vehicles. However, given its advantages in terms of range and zero emissions from vehicles with hydrogen fuel cells, the technology could play an important role in the future for vehicles that need to be permanently accessible and also heavy-duty vehicles that are difficult to electrify.

[6] The Third Industrial Revolution Strategy Study for the Grand Duchy of Luxembourg, November 2016
https://www.troisiemerevolutionindustrielle.lu/

2.2. Estimate of the number of alternative fuel vehicles

In accordance with Directive 2014/94/EU, Member States must estimate the number of alternative fuel vehicles expected for 2020, 2025 and 2030.

As regards electric mobility, the government has set out, in its draft National Energy and Climate Plan (NECP) ([7]), ambitious targets for reducing CO_2, developing renewable energy and increasing energy efficiency by 2030. Electromobility has a key role to play in the transport sector. For example, the government has set the target that, by 2030, 49% of all passenger cars will be plug-in electric vehicles (BEV and PHEV). This will mean approximately 200,000 electric cars. As it is essential that such a number of electric cars has access to a recharging infrastructure of the same scale, the government has at the same time set similar targets for normal, fast, rapid and ultra-rapid recharging stations. As regards public transport, it should be noted that the government has undertaken to continue electrifying coach fleets.

In view of the change in significance of CNG as an alternative fuel, the government believes that the number of refuelling points will reduce in coming years until only one such refuelling point remains publicly accessible. The existing fleet of around 200 CNG cars and vans (see Section 1.4) is naturally expected to shrink once most of the refuelling points close. However, by maintaining one CNG refuelling point, there will continue to be a limited number of CNG cars and commercial vehicles registered in Luxembourg. In the area of public transport, TICE also has no intention of moving away from CNG technology and is planning to gradually increase the CNG bus fleet. With regard to LNG, however, it is likely that the number of LNG vehicles will continue to increase in Luxembourg. These will mostly be heavy goods vehicles.

With regard to hydrogen and in accordance with Directive 2014/94/EU, the government has decided not to include public hydrogen refuelling points in its national policy framework. This alternative fuel technology is still not regarded as mature and a target for the planned number of vehicles by 2025 and 2030 has therefore not been set. However, to ensure the development of hydrogen technology at European level, the government has committed, in its coalition agreement 2018-2023 ([8]), to arrange for at least one hydrogen refuelling station to be installed at one of the motorway service areas.

[7] Draft Climate and Energy Plan https://mea.gouvernement.lu/dam-assets/actualites/2019/NECP-draft-LUX.pdf

[8] https://gouvernement.lu/dam-assets/documents/actualites/2018/12-decembre/Accord-de-coalition-2018-2023.pdf, Coalition agreement 2018-2013, Luxembourg Government, December 2018.

Table 2-1: Estimate of the number of alternative fuel vehicles

	2020	**2025**	**2030**
Electric vehicles (EV)	**11,465**	**103,800**	**207,600**
CNG vehicles	180	125	100
LNG vehicles	50	150	150
FCEV	*	*	*
Total	**1,763**	**3,026**	**4,188**

* Hydrogen is not included in the national policy framework.

The following sections detail the targets for the various categories of registered vehicles and for the recharging or refuelling infrastructure for electricity, CNG and LNG.

2.3. Electricity

With regard to electric vehicles, the government anticipates that the number of battery electric vehicles (BEV) will increase in each vehicle category. The number of plug-in hybrid electric vehicles (PHEV) will continue to increase among passenger cars. However, it is estimated that this hybrid technology will have limited success in the other vehicle categories.

Table 2-2: Estimate of the number of electric vehicles (EV)

	2020	2025	2030
Electric vehicles	**11,465**	**103,800**	**207,600**
Electric two and three wheelers and quadricycles (PTW)	**1,000**	**2,500**	**5,000**
Electric vehicles (excl. PTW)	**10,465**	**101,300**	**202,600**
Passenger cars (BEV+PHEV)	10,000	100,000	200,000
• BEV	10,000	100,000	200,000
• PHEV			
Vans (BEV+PHEV)	300	500	1,000
• BEV	300	500	1,000
• PHEV	0	0	0
Lorries (BEV+PHEV)	15	50	100
• BEV	15	50	100
• PHEV	0	0	0
Buses and coaches (BEV+PHEV)	150	750	1 500
• BEV	125	700	1,400
• PHEV	25	50	100

As it is essential that recharging infrastructure is publicly accessible so that electric vehicles can be recharged, the government has also set similar targets for normal, fast, rapid and ultra-rapid recharging stations.

Table 2-3: Planned number of recharging points

	2020	2025	2030
Publicly accessible recharging points	**1,635**	**5,160**	**10,320**
Normal power recharging points, P ≤ 22 kW (public)	1,600	5,000	10,000
High power recharging points, P > 22 kW (public)	35	160	320
• AC fast charging, 22 kW < P ≤ 43 kW (public)	5	10	20
• DC rapid charging, P < 100 kW (public)	20	50	100
• DC ultra-rapid charging, P ≥ 100 kW (public)	10	100	200

A technical and economic study ([9]) carried out by the government and the Luxembourg Regulatory Authority (*Institut Luxembourgeois de Régulation* – ILR) in 2011 enabled a joint national concept to be developed for rolling out electric mobility in Luxembourg. The conclusions of that study were included in a law establishing a framework that sets out the main principles for developing electric mobility ([10]). On the basis of that study, which assumes – supported by an analysis of the situation in Luxembourg – that 95% of primary recharging will use private recharging points (in particular residential) and that approximately 5% of all charging will use public recharging infrastructure, the Luxembourg government has set the target of installing around 800 normal power (≤ 22 kW) recharging stations accessible to the public by 2020. As each recharging station has two recharging points, this equates to 1,600 public recharging points by 2020. The public infrastructure will reassure users with access to a private recharging point that their secondary recharging needs can be met. This infrastructure will be installed in key locations (park-and-ride facilities and public roads). Moreover, these 800 stations, which will be installed on an ad-hoc basis, will make the public infrastructure more visible. In line with the aforementioned study, this public infrastructure, together with private recharging points, will be sufficient to power at least 40,000 electric cars.

As regards fast/rapid recharging (> 22 kW and < 100 kW) and ultra-rapid recharging (> 100 kW), AC fast recharging points (22 kW < P ≤ 43 kW) are expected to be less important. The number of electric vehicle models capable of AC recharging up to 43 kW is actually very low, and recharging speeds are similar to those of the 800 publicly accessible 22 kW recharging stations planned for 2020. It is therefore estimated that the number of fast recharging points will increase only modestly up to 2030. Similarly, it is anticipated that the number of DC rapid recharging points (< 100 kW) will gradually increase up to 100 publicly accessible recharging points.

However, in order to encourage long-distance journeys in electric vehicles, it is vital that a network of DC ultra-rapid recharging points (> 100 kW) is installed, especially along motorways, for example at service areas, but also along other national roads, such as 'Route Nationale 7'. With this in mind, the government plans to install 200 ultra-rapid recharging points by 2030.

[9] *Etude technico-économique pour la mise en œuvre nationale de l'électromobilité au Luxembourg* (Technical and economic study on the national roll-out of electromobility in Luxembourg), December 2011.

[10] Law of 7 August 2012 amending the amended Law of 1 August 2007 on the organisation of the electricity market (*Loi du 7 août 2012 modifiant la loi modifiée du 1er août 2007 relative à l'organisation du marché de l'électricité*).

The targets set for providing electricity supplies to stationary aircraft are in line with the current infrastructure in this respect at Luxembourg airport. At this location, there are currently 44 electricity supply units available for aircraft. Luxairport does not at the moment plan to increase this number. However, it does plan to draw up a procedure encouraging each operator to switch off its APU (Auxiliary Power Unit: a small jet engine in the tail that is coupled to a generator) and connect to a 'Static Power' or GPU electricity supply.

Table 2-4: Planned electricity supplies at airports

	2020	2025	2030
Electricity supplies for stationary aircraft	**44**	**44**	**44**

Currently, the port at Mertert, which is part of the TEN-T Core Network, does not have any shore-side electricity supply infrastructure for inland waterway vessels. However, it is expected that the low power (230V + 400V) and high power (400V/400A) electricity supply terminal infrastructure at the docks along the Moselle will be modestly expanded in coming years.

Table 2-5: Planned electricity supplies at ports and docks

	2020	2025	2030
Shore-side electricity supplies at ports (terminals)	**6**	**10**	**10**

2.4. Natural gas

When in 2018 the operator of the six CNG refuelling stations that were available to the public at the time decided that they were not economically viable, it reduced the number to two. As indicated in 2016 in the first national policy framework for alternative fuels infrastructure in the transport sector, the government believes that a single publicly accessible CNG refuelling point may be sufficient in the long term. This is a substantial reduction from the infrastructure that was available up to 2018. This number is regarded as appropriate in terms of demand from national and international users, and also meets the criterion for a maximum distance of 150 km between CNG stations that is indicated by Directive 2014/94/EU.

Table 2-6: Planned number of CNG refuelling points

	2020	2025	2030
CNG refuelling points (total)	**3**	**2**	**2**
CNG refuelling points (public)	2	1	1
CNG refuelling points (private)	1	1	1

As a result, the number of CNG vehicles registered in Luxembourg is likely to decrease even further. Only the bus operator TICE plans to maintain and even modestly expand its fleet of CNG buses, which are, however, supplied by the operator's own refuelling station.

Table 2-7: Estimate of the number of CNG vehicles

	2020	2025	2030
CNG vehicles	**180**	**125**	**100**
CNG two and three wheelers and quadricycles (PTW)	**0**	**0**	**0**
CNG vehicles (excl. PTW)	**180**	**125**	**100**
CNG passenger cars	100	50	25
CNG vans	20	10	5
CNG lorries	5	5	5
CNG buses and coaches	55	60	65

As regards LNG, the installation of refuelling infrastructure for road transport at motorway service areas is not currently planned.

Table 2-8: Planned number of LNG refuelling points for road vehicles

	2020	2025	2030
LNG refuelling points (total)	**1**	**1**	**1**
LNG refuelling points (public)	1	1	1
LNG refuelling points (private)	1	1	1

As regards the estimated number of LNG vehicles, it is likely that only LNG heavy goods vehicles will be registered in Luxembourg. It is estimated that the number of such registered vehicles will further increase, even though a public LNG refuelling station is not planned.

Table 2-9: Estimate of the number of LNG vehicles

	2020	2025	2030
LNG vehicles	**50**	**150**	**150**
LNG two wheelers	**0**	**0**	**0**
LNG passenger cars	0	0	0
LNG vans	0	0	0
LNG lorries	50	150	150
LNG buses and coaches	0	0	0

As LNG vessels have a considerable range, LNG refuelling infrastructure at the port of Mertert is not considered viable. The decision has therefore been taken not to install LNG infrastructure in Luxembourg for vessels operating on the Moselle. LNG vessels are able to make a return journey between the port of Rotterdam and the port of Basel without needing to refuel with LNG during the journey. However, a 'ship-to-ship' refuelling vessel operating in the surrounding waters or a 'truck-to-ship' refuelling lorry can assist in one-off cases at the port of Mertert.

Table 2-10: Planned number of LNG refuelling points at ports

	2020	2025	2030
Maritime ports – LNG refuelling points	/	/	/
Inland ports – LNG refuelling points	0	0	0

2.5. Hydrogen

Hydrogen produced by electrolysis using electricity generated from renewable sources undeniably offers real advantages in terms of increasing range and lowering emissions. However, it also has certain prohibitive disadvantages, namely the uncompetitive cost of producing carbon-free hydrogen and hydrogen-powered vehicles. Significant technological progress is still needed in order to make this technology competitive. If the hydrogen industry maintains or even steps up its efforts in terms of developing this technology and its environmentally-friendly production, it could become competitive beyond 2030.

As regards development targets for refuelling points and in accordance with Directive 2014/94/EU, the government has decided not to currently include public hydrogen refuelling points in its national policy framework (see Section 2.2).

Table 2-11: Planned number of hydrogen refuelling points

	2020	2025	2030
H2 refuelling points (total)	*	*	*
H2 refuelling points – 350 bar (total)			
H2 refuelling points – 350 bar (public)			
H2 refuelling points – 350 bar (private)			
H2 refuelling points – 700 bar (total)			
H2 refuelling points – 700 bar (public)			
H2 refuelling points – 700 bar (private)			

* Hydrogen is not included in the national policy framework.

As a result, the number of fuel cell electric vehicles has not been estimated.

Table 2-12: Planned number of FCEV

	2016	2017	2018
FCEV	*	*	*
FCEV two wheelers			
FCEV passenger cars			
FCEV vans			
FCEV lorries			
FCEV buses and coaches			

* Hydrogen is not included in the national policy framework.

3. Necessary measures to achieve the national targets

3.1. Legal measures

3.1.1. Law of 7 August 2012 amending the amended Law of 1 August 2007 on the organisation of the electricity market

The Law of 7 August 2012 amending the amended Law of 1 August 2007 on the organisation of the electricity market ([11]) established the legal basis for the responsibilities of distribution system operators (DSO) and the organisational principles for deploying national public recharging infrastructure managed through a single central system. This amended Law forms the government's legal basis for the planned roll-out of public infrastructure comprising 1,600 recharging points for electric cars by the end of 2020.

According to this Law, the roll-out, operation and maintenance of this public electric mobility equipment will be mainly financed through tariffs for the use of low-voltage electricity networks.

3.1.2. Grand-Ducal Regulation of 3 December 2015 on public infrastructure associated with electric mobility

The amended Law on the organisation of the electricity market (see Section 3.1.1) also forms the legal basis for the Grand-Ducal Regulation of 3 December 2015 on public infrastructure associated with electric mobility ([12]). This Regulation determines the functions of this public infrastructure, the technical specifications of the central system, the total number of recharging points, the timetable and the general organisation of the deployment by distribution system operators. It is therefore planned to install half of the 1,600 recharging points at park-and-ride facilities in Luxembourg and to set up the remaining 800 recharging points near to local interest sites. The final location of the recharging stations allocated to municipalities must be decided by the municipal authorities, and these stations must be rolled out in accordance with a general installation plan adopted under the Ministerial Regulation of 5 February 2016.

Furthermore, these 1,600 recharging points are the points that distribution system operators must install at park-and-ride facilities and in municipalities. However, municipal authorities or other private operators may also install additional recharging points. Provided that these recharging stations have the minimum functional and technical characteristics laid down in the relevant Grand-Ducal Regulation and are accessible to the public, they may be included in the common central management system.

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[11] Law of 1 August 2007 on the organisation of the electricity market (*Loi du 1er août 2007 relative à l'organisation du marché de l'électricité*) http://eli.legilux.public.lu/eli/etat/leg/loi/2007/08/01/n13/jo

[12] Grand-Ducal Regulation of 3 December 2015 on public infrastructure associated with electric mobility (*Règlement grand-ducal du 3 décembre 2015 relatif à l'infrastructure publique liée à la mobilité électrique*) http://eli.legilux.public.lu/eli/etat/leg/rgd/2015/12/03/n2/jo

This Grand-Ducal Regulation was amended by the Grand-Ducal Regulation of 13 November 2018 on alternative fuels infrastructure to ensure that the measures taken are in line with the required transposition of Directive 2014/94/EU on alternative fuels infrastructure.

3.1.3. Ministerial Regulation of 5 February 2016 establishing a general installation plan for public infrastructure associated with electric mobility

The Ministerial Regulation of 5 February 2016 ([13]) establishes the general installation plan defining the park-and-ride facilities at which the public recharging stations will be installed and the number of stations to be installed at each of these car parks (Annexes 1 and 3). One recharging station equates to two recharging points. In addition, the general installation plan defines, for each municipality, the number of public recharging stations to be installed in public car parks or public parking spaces in the respective municipality (Annexes 2 and 4). The municipal authorities must decide the location of the recharging stations allocated to public car parks and parking spaces in close consultation with the distribution system operators. These locations must meet the criteria of being near to local interest sites as defined in Article 10 of the Grand-Ducal Regulation.

3.1.4. Grand-Ducal Regulation of 13 November 2018 on alternative fuels infrastructure and amending the Grand-Ducal Regulation of 3 December 2015 on public infrastructure associated with electric mobility

The Grand-Ducal Regulation of 13 November 2018 on alternative fuels infrastructure and amending the Grand-Ducal Regulation of 3 December 2015 on public infrastructure associated with electric mobility ([14]) defines which fuels are to be regarded as alternative and lays down the technical specifications for CNG and hydrogen refuelling points. It also defines which information on alternative fuels infrastructure must be made available to users. This Regulation amends the Regulation on public infrastructure associated with electric mobility (see Section 3.1.2) to ensure that the measures taken in the latter are in line with the required transposition of Directive 2014/94/EU on alternative fuels infrastructure.

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[13] Ministerial Regulation of 5 February 2016 establishing a general installation plan for public infrastructure associated with electric mobility (*Règlement ministériel du 5 février 2016 fixant un plan d'implantation général pour l'infrastructure publique liée à la mobilité électrique*) http://eli.legilux.public.lu/eli/etat/leg/rmin/2016/02/05/n1

[14] Grand-Ducal Regulation of 13 November 2018 on alternative fuels infrastructure and amending the Grand-Ducal Regulation of 3 December 2015 on public infrastructure associated with electric mobility (*Règlement grand-ducal du 13 novembre 2018 relatif aux infrastructures pour carburants alternatifs et modifiant le règlement grand-ducal du 3 décembre 2015 relatif à l'infrastructure publique liée à la mobilité électrique*) http://legilux.public.lu/eli/etat/leg/rgd/2018/11/13/a1047/jo

3.1.5. Law of 5 July 2016 on the organisation of taxi services

The Law of 5 July 2016 on the organisation of taxi services, which reformed the taxi market in Luxembourg, introduced the 'zero-emission taxi'. This type of vehicle is defined as a taxi emitting no CO_2 or NO_x locally, i.e. electric vehicles or fuel cell electric vehicles. These are the only taxis that will be granted additional operating licences in the future, thereby helping to achieve urban environmental objectives as imposed by EU regulations on compliance with NO_x emission limits.

Out of the 501 operating licences in use at the end of 2019, 65 were allocated to battery electric vehicles (13% market share).

3.1.6. Law of 22 December 2006 promoting job retention and laying down special measures in the area of social security and environment policy

The Law of 22 December 2006 promoting job retention and laying down special measures in the area of social security and environment policy introduced a new tax calculation formula for M1 passenger cars first registered on or after 1 January 2001. The new calculation formula ensures that the level of tax payable rises in proportion to the CO_2 emission value in g/km (above 90 g/km). Vehicles with a non-diesel engine are also favoured over diesel vehicles.

The draft Law amending the amended Law of 22 December 2006 promoting job retention and laying down special measures in the area of social security and environment policy provides that, from 1 March 2020, the CO_2 emission value in g/km determined by the WLTP will be used to calculate vehicle tax for new registrations. The WLTP therefore replaces the New European Driving Cycle (NEDC), which no longer adequately reflects current driving conditions or vehicle technologies. The WLTP provides CO_2 emission and fuel consumption values that are more representative of real-world conditions, for the benefit of consumers and regulators at European and national level. It is a stronger incentive for the deployment of fuel-efficient and low-carbon technologies. On average, comparisons show that the level of CO_2 emissions with the WLTP test is 20% higher than with the NEDC test. The use of WLTP values to calculate vehicle tax will ensure that zero or low CO_2 emission passenger cars and light commercial vehicles are further promoted. Full information on the transition from the NEDC standard to the new WLTP standard is available on a dedicated website ([15]) and through the respective brochure (Annex 5).

[15] www.wltp.lu

3.1.7. Law of 23 December 2016 implementing the 2017 tax reform

As part of the tax reform ([16]) initiated in 2017, the government introduced tax incentives for the purchase of alternative fuel vehicles. As a result, a tax allowance of €5,000 for zero emission cars (BEV and FCEV) was introduced for individuals from 1 January 2017. An allowance of €300 for the purchase of a cycle or a cycle with pedal assistance was also introduced. In January 2018, a tax allowance of €2,500 for PHEV cars with CO_2 emissions of 50 g/km or less was also introduced.

3.1.8. Grand-Ducal Regulation of 23 December 2016 implementing Article 104(3) of the amended Income Tax Law of 4 December 1967

As part of the 2017 reform, the method of calculating benefit in kind for category M1 company cars made available, at least partially, for non-business purposes by the employer to the employee was amended by the Regulation in question ([17]). As a result, since 2017, benefit in kind has been calculated based on the engine and CO_2 emissions. A penalty for cars with diesel engines as opposed to other types of engine has also been introduced. Benefit in kind for company cars is therefore staggered so that cars with low CO_2 emissions, especially BEV or PHEV cars, are favoured over petrol or diesel cars. For cars with zero emissions (BEV and FCEV), a very favourable rate of 0.5% has been introduced. Given the high turnover of company cars, as these vehicles account on average for almost half of all new registrations every year, all these changes have been introduced with the aim of reducing emissions from the national fleet.

3.1.9. Grand-Ducal Regulation of 7 March 2019 introducing financial aid for the promotion of zero or low CO_2 emission road vehicles

As announced in the coalition agreement, the government has decided to further promote the decarbonisation of road vehicles through more substantial, directly accessible and eligible financial incentives for more vehicle categories. Even with the tax measures introduced since 2017 (see Section 3.1.7) for BEV, FCEV and PHEV, their market share among new registrations remained below 1.8% in 2018. Furthermore, the tax allowance scheme was regarded as too complex and too difficult to communicate to potential customers of alternative fuel vehicles.

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[16] Law of 23 December 2016 implementing the 2017 tax reform (*Loi du 23 décembre 2016 portant mise en œuvre de la réforme fiscale 2017*) http://legilux.public.lu/eli/etat/leg/loi/2016/12/23/n11/jo

[17] Grand-Ducal Regulation of 23 December 2016 implementing Article 104(3) of the amended Income Tax Law of 4 December 1967 (*Règlement grand-ducal du 23 décembre 2016 portant exécution de l'article 104, alinéa 3 de la loi modifiée du 4 décembre 1967 concernant l'impôt sur le revenu*) http://legilux.public.lu/eli/etat/leg/rgd/2016/12/23/n7/jo

The Grand-Ducal Regulation of 7 March 2019 ([18]) therefore introduced, for vehicles first registered in 2019, financial aid of €5,000 for BEV cars and vans and €2,500 for PHEV cars and vans with CO_2 emissions of up to 50 g/km, and bonuses of up to €500 for the following BEV: quadricycle, motorcycle, light motorcycle (125 cm^3) and moped (scooter and pedelec45).

3.1.10. Grand-Ducal Regulation of 7 March 2019 amending the amended Grand-Ducal Regulation of 30 November 2007 on the energy performance of residential buildings and the amended Grand-Ducal Regulation of 31 August 2010 on the energy performance of functional buildings

The Regulation in question ([19]) introduces obligations for functional and residential buildings with regard to charging devices for plug-in electric cars (EV). For single-family homes and blocks of flats, indoor parking spaces and covered outdoor spaces must be designed and equipped in such a way that they can subsequently accommodate a charging device for plug-in hybrid or electric vehicles. For functional buildings, indoor parking spaces and outdoor spaces must be designed and equipped in such a way that they can subsequently accommodate a charging device for plug-in hybrid or electric vehicles. The current obligations are explained in detail in Section 4 on measures to encourage and facilitate the deployment of recharging points not accessible to the public.

3.1.11. Grand-Ducal Regulation of 20 December 2019 amending the Grand-Ducal Regulation of 7 March 2019 introducing financial aid for the promotion of zero or low CO_2 emission road vehicles

This Grand-Ducal Regulation ([20]) extends, for 2020, the direct financial aid scheme for the purchase of a zero or low CO_2 emission road vehicle (see Section 3.1.9).

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[18] Grand-Ducal Regulation of 7 March 2019 introducing financial aid for the promotion of zero or low CO_2 emission road vehicles and amending the amended Grand-Ducal Decree of 23 November 1955 regulating traffic on all public roads (*Règlement grand-ducal du 7 mars 2019 portant introduction d'une aide financière pour la promotion des véhicules routiers à zéro ou à faibles émissions de CO2 et modifiant l'arrêté grand-ducal modifié du 23 novembre 1955 portant règlement de la circulation sur toutes les voies publiques*) http://legilux.public.lu/eli/etat/leg/rgd/2019/03/07/a183/jo

[19] Grand-Ducal Regulation of 7 March 2019 amending the amended Grand-Ducal Regulation of 30 November 2007 on the energy performance of residential buildings and the amended Grand-Ducal Regulation of 31 August 2010 on the energy performance of functional buildings (*Règlement grand-ducal du 7 mars 2019 modifiant le règlement grand-ducal modifié du 30 novembre 2007 concernant la performance énergétique des bâtiments d'habitation et le règlement grand-ducal modifié du 31 août 2010 concernant la performance énergétique des bâtiments fonctionnels*) http://legilux.public.lu/eli/etat/leg/rgd/2019/03/07/a227/jo

[20] Grand-Ducal Regulation of 20 December 2019 amending the Grand-Ducal Regulation of 7 March 2019 introducing financial aid for the promotion of zero or low CO_2 emission road vehicles and amending the amended Grand-Ducal Decree of 23 November 1955 regulating traffic on all public roads (*Règlement grand-ducal du 20 décembre 2019 modifiant le règlement*

3.1.12. Grand-Ducal Regulation of 20 December 2019 amending the Grand-Ducal Regulation of 23 December 2016 implementing Article 104(3) of the amended Income Tax Law of 4 December 1967

This Regulation ([21]) amends the Regulation referred to in Section 3.1.8 and lays down transitional arrangements for applying the new WLTP test cycle in order to calculate benefit in kind for company vehicles. For company cars with existing contracts or contracts signed in 2019 (first entry into service of the vehicle in 2020), benefit in kind will continue to be calculated using the NEDC values. For company cars registered in 2020 (contract not signed until after 31 December 2019), benefit in kind will be calculated in 2020 using the NEDC values and from 2021 using the WLTP values. For all company cars registered on or after 1 January 2021, benefit in kind will be calculated using the WLTP values only.

Application of the WLTP standard will result in the promotion of alternative fuel vehicles, as preferential benefit-in-kind rates can generally only be obtained by engines with low or zero emissions. Full information on the transition from the NEDC standard to the new WLTP standard is available on a dedicated website ([22]) and through the respective brochure (Annex 5).

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grand-ducal du 7 mars 2019 portant introduction d'une aide financière pour la promotion des véhicules routiers à zéro ou à faibles émissions de CO2 et modifiant l'arrêté grand-ducal modifié du 23 novembre 1955 portant règlement de la circulation sur toutes les voies publiques) http://legilux.public.lu/eli/etat/leg/rgd/2019/12/20/a904/jo

[21] Grand-Ducal Regulation of 20 December 2019 amending the Grand-Ducal Regulation of 23 December 2016 implementing Article 104(3) of the amended Income Tax Law of 4 December 1967 (*Règlement grand-ducal du 20 décembre 2019 modifiant le règlement grand-ducal du 23 décembre 2016 portant exécution de l'article 104, alinéa 3 de la loi modifiée du 4 décembre 1967 concernant l'impôt sur le revenu*) http://legilux.public.lu/eli/etat/leg/rgd/2019/12/20/a891/jo

[22] www.wltp.lu

3.2. Incentives and funding

3.2.1. Infrastructure deployment and construction measures

3.2.1.1. 'Chargy' public recharging infrastructure

Distribution system operators are currently implementing the public infrastructure project comprising 1,600 electric vehicle recharging points to be installed by the end of 2020, as determined by the legal basis indicated in Sections 3.1.1 and 3.1.2.

The initial stations in the 'CHARGY' ([23]) network have been operational since June 2017. By the end of 2019, around 350 of the 800 stations throughout the country had been installed. It is planned that 800 stations with a recharging power of up to 22 kW for battery electric cars and plug-in hybrid electric vehicles will be deployed by distribution system operators by the end of 2020. Spread throughout the national territory, 400 stations will be installed at park-and-ride facilities allowing commuters to connect to public transport, and 400 stations will be installed in public parking spaces and public car parks in the municipalities.

Each station will be equipped with two recharging points with a type 2 connector. As a result, a total of 1,600 parking spaces will be dedicated to the recharging of cars. Designed to incorporate all the other compatible stations that already exist in Luxembourg, the public recharging infrastructure is based on a shared central computer system enabling, in particular, the electronic management of the recharging stations and the communication of data between the recharging stations and the 35 recharging service providers currently offering their recharging services on the platform.

The national geoportal ([24]) has a map showing real-time data on available 'CHARGY' stations. An example of this map can be found in Annex 9.

3.2.1.2. '*Lëtzebuerg gëtt Gas*' CNG refuelling stations

In 2018 the Climate and Energy Fund provided €100,000 in financial aid to the '*Lëtzebuerg gëtt Gas*' association so that it could upgrade two of its six CNG refuelling stations that were in use at the time. In addition to technically upgrading its facilities, the operator undertook to keep these stations operational for at least 10 years. As indicated in 2016 in the first national policy framework for alternative fuels infrastructure in the transport sector, this measure means that at least one publicly accessible CNG refuelling point will be maintained in the long term in Luxembourg. This number is regarded as

[23] www.chargy.lu

[24] www.g-o.lu/chargy

appropriate in terms of demand from national and international users, and also meets the criterion for a maximum distance of 150 km between CNG stations that is indicated by Directive 2014/94/EU.

3.2.2. Measures to develop alternative fuel technologies

In 2017 the State provided the undertaking UJet ([25]) with €70,000 to cover 10% of the investment costs in the first stage of production of light motorcycles produced and assembled in Foetz and Leudelange. The factory has a surface area of approximately 1,500 m^2 and a production capacity of 10,000 units per year.

3.2.3. Incentives for the purchase of alternative fuel vehicles

3.2.3.1. Tax allowances and recalculation of the '*Clever fueren, Steiere spueren*' benefit in kind

As described in Sections 3.1.7 and 3.1.8, the Law of 23 December 2016 implementing the 2017 tax reform and the Grand-Ducal Regulation of 23 December 2016 implementing Article 104(3) of the amended Income Tax Law of 4 December 1967 created the legal framework for implementing new incentives for the purchase of certain alternative fuel cars from 1 January 2017. As a result, a tax allowance of €5,000 for zero emission cars (BEV and FCEV) was introduced for individuals from 1 January 2017. An allowance of €300 for the purchase of a cycle or a cycle with pedal assistance was also introduced. In January 2018, a tax allowance of €2,500 for PHEV cars with CO_2 emissions of 50 g/km or less was also introduced. Furthermore, since 2017, benefit in kind has been calculated based on the engine and CO_2 emissions. A penalty for cars with diesel engines as opposed to other types of engine has also been introduced. Benefit in kind for company cars is therefore staggered so that cars with low CO_2 emissions, especially BEV or PHEV cars, are favoured over petrol or diesel cars. For cars with zero emissions (BEV and FCEV), a very favourable rate of 0.5% has been introduced.

A national advertising campaign entitled '*Clever fueren, Steiere spueren*' ('Drive smart, save tax') has been run to inform the public about the new tax rules in place. An overview of all the tax allowances and the assessment grid for determining benefit in kind can be found in Annexes 6 and 7.

[25] https://ujet.com/

3.2.3.2. Purchase of plug-in electric cars for government services

In February 2017 the government decided that only BEV cars or, where appropriate, PHEV cars should be purchased from 2018. Cars with internal combustion engines (petrol or diesel) can only be purchased in very exceptional cases or for specific vehicles, based on a detailed justification. BEV and PHEV cars are purchased centrally under the responsibility of the Ministry of Mobility and Public Works, Department of Mobility and Transport. Ordinary administrative-type cars with internal combustion engines (petrol or diesel) can only be purchased in exceptional circumstances, based on a detailed justification and with necessary authorisation from the Ministry of the Environment, Climate and Sustainable Development. Since 2017, the Department of Mobility and Transport has organised three European calls for tender for a total of 56 BEV cars and 36 PHEV cars.

Directive (EU) 2019/1161 of the European Parliament and of the Council of 20 June 2019 amending Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles (26) sets ambitious targets for Luxembourg for the deployment of clean cars used by public institutions. The highest targets are therefore set for Luxembourg, and also Sweden, including a rate of 38.5% of clean cars and vans in calls for tender between 2021 and 2026 and the same rate of 38.5% of clean cars and vans for the period from 2026 to 2030. However, in view of the initiatives already taken by the government and as the 38.5% rate was actually exceeded in 2018 and 2019, it is likely that the targets set by the Directive can be achieved.

3.2.3.3. '*Clever fueren, Sue spueren*' purchase bonuses

As described in Section 3.1.9, the Grand-Ducal Regulation of 7 March 2019 introduced financial aid for the promotion of zero or low CO_2 emission road vehicles. Financial aid of €5,000 was introduced for BEV cars and vans first registered in 2019. This was coupled with financial aid of €2,500 for PHEV cars and vans with CO_2 emissions of up to 50 g/km and bonuses of up to €500 for the following BEV: quadricycle, motorcycle, light motorcycle (125 cm^3) and moped (scooter and pedelec45). All these purchase bonuses have been extended for vehicles first registered in 2020 (see Section 3.1.11).

A new national advertising campaign entitled '*Clever fueren, Sue spueren*' ('Drive smart, save money') has been run to inform the public about the new purchase bonuses for new vehicles. Full information on

[26] Directive (EU) 2019/1161 of the European Parliament and of the Council of 20 June 2019 amending Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles https://eur-lex.europa.eu/legal-content/en/TXT/HTML/?uri=CELEX:32019L1161&from=EN

the new purchase bonuses and their eligibility conditions is available on a dedicated website ([27]). A poster for the €5,000 bonus for BEV cars or vans is shown in Annex 8.

3.2.4. Research, technological development and demonstration (RTD&D)

Among the various research, technological development and demonstration projects that are currently being conducted in the field of alternative fuels in Luxembourg (Tableau 3-1), there are, in particular, projects initiated by various research institutes, such as the University of Luxembourg or the Luxembourg Institute of Science and Technology (LIST), which are being funded either by the Luxembourg National Research Fund (FNR – *Fonds national de la recherche*) or by the European Regional Development Fund (ERDF).

Table 3-1: RTD&D investment programmes

No	Name	Description	Total Budget (k€)	Start	End
2	MERLIN	Multimodal electrified infrastructure planning	900	2018	2022
3	eCoBus	Electrified Cooperative Bus System	900	2017	2020
4	PorSi3DLIB	Porous Silicon 3D Lithium-ion Battery	399	2019	
4	IDACS	ID & Data Collection for Sustainable fuels in Europe	205	2019	2021

The University of Luxembourg's MERLIN ([28]) project, which is funded by the ERDF, aims to develop a platform for assessing the impact of the country's various mobility solutions. This platform will act as an aid to decision-making that can make suggestions about how to modify the public transport network, taking into account the urban dynamic as well as any major infrastructure changes that are planned. This support tool will also indicate where to replace conventionally powered public transport services with electrified transport services, as well as the optimum location for recharging points.

The eCoBus ([29]) project, funded by the FNR, is a University of Luxembourg project that is being conducted in partnership with Volvo Buses, Sales-Lentz, PTV Group, KU Leuven and the University of

[27] http://www.cleverfueren.lu/

[28] https://mobilab.lu/merlin/

[29] https://ecobus.lu/

Cádiz. Its aim is to develop a cooperative and integrated intelligent transport system (ITS), which will coordinate electric buses, recharging infrastructure and traffic management. The purpose of this C-ITS is to reduce total energy consumption and improve the integration of electric buses in public transport operations as well as in subsequent developments.

PorSi3DLIB is a public-private cooperation project conducted by the LIST and funded by the FNR. This project is focusing on developing new Li-ion 3D batteries that are based on permeable silicone membranes and that offer better performance in terms of energy density (at least 800 Wh.L-1) and also safety, as the battery should not stop working if it suffers local mechanical damage. The membranes will be filled with the substances in situ by atomic layer deposition techniques and/or electrochemical techniques in order to achieve the maximum density of pores per surface area.

Another very important technological development project involving alternative fuels infrastructure is the European IDACS project (ID and Data Collection for Sustainable fuels in Europe), in which Luxembourg is participating with 14 other Member States of the European Union (see Section 3.2.4).

3.3. Information and educational measures

3.3.1. 'Modu 2.0' mobility strategy

In May 2018 the MDDI's Department of Transport published the new national mobility strategy entitled 'Modu 2.0'. This document was designed to raise public awareness of mobility and its associated challenges, and also to inform municipalities, employers and citizens about the wealth of measures, both large and small, that everyone can take now to ensure more sustainable mobility in Luxembourg. Section 3 of the 'Modu 2.0' document therefore illustrates the mobility 'toolbox', i.e. around 50 concrete measures that the four mobility stakeholders – the State, municipalities, employers and citizens – can take. One category of this toolbox comprises alternative fuel measures. It is therefore recommended that individuals opt for a vehicle with zero or low emissions when purchasing a new car, which will allow them to benefit from the current incentives. Municipalities and companies are informed that additional 'Chargy OK' stations can be added to the 1,600 'Chargy' recharging points planned for 2020.

The 'Modu 2.0' national mobility strategy was published in French, German and Luxemburgish and can be downloaded from the dedicated website ([30]). Extracts from the alternative fuels section of the 'Modu 2.0' document can be found in Annex 10.

[30] 'Modu 2.0' national mobility strategy, www.modu2.lu

3.3.2. '*Comment charger votre voiture électrique*' brochure

Myenergy is the national structure for promoting a sustainable energy transition. Supported by the State of the Grand Duchy of Luxembourg, represented by the Ministry of Energy and Spatial Planning, the Ministry of the Environment, Climate and Sustainable Development and the Ministry of Housing, and in collaboration with the Chamber of Trades (*Chambre des Métiers*) and the Association of Architects and Consulting Engineers (*Ordre des Architectes et Ingénieurs-conseils*), its task is to be the reference partner and public facilitator in encouraging and supporting the transition of Luxembourg society to rational and sustainable energy use.

The activities of myenergy are focused on reducing energy consumption, promoting renewable energy and ensuring sustainable construction and housing. Since 2018, basic advice on sustainable mobility, including electric mobility in particular, has been part of myenergy's offer. It acts as a partner to all energy consumers in order to support their efforts to transition to rational and sustainable energy use. It also acts as a facilitator for those sectors concerned with energy, in order to help find appropriate solutions that always ensure more rational and sustainable energy use.

With regard to information for the general public on electric mobility, myenergy has published a brochure in French and German entitled '*Comment charger votre voiture électrique ?*' ([31]) ('How to charge your electric car'), which provides basic information on electric mobility, such as the existing recharging infrastructure and incentives for the purchase of a plug-in electric car. The brochure particularly explains about 'private' charging (at home and at work) and about the steps to be taken to install a private recharging station. The brochure was drawn up in collaboration with all the state stakeholders, as well as other relevant stakeholders such as the DSOs, the *Groupement des syndics professionnels du Luxembourg* (Luxembourg Association of Professional Property Managers), representatives of the motor vehicle industry and the *Fédération des Artisans* (Craft Federation).

Extracts from the '*Comment charger votre voiture électrique ?*' brochure can be found in Annex 11.

3.4. Cooperation with other Member States

As Member States must comply with a common framework and minimum requirements for the deployment of a continued network of alternative fuels infrastructure, Article 3(4) of Directive 2014/94/EU lays down that, where necessary, Member States must cooperate, by means of consultations or joint policy frameworks, to ensure that the measures required to achieve the objectives of the Directive are coherent and coordinated.

[31] Myenergy brochure, French version https://www.myenergy.lu/fr/mediatheque/telechargements/telecharger/1011

In terms of the need for regional cooperation, the Grand Duchy of Luxembourg focuses on cooperating with the Benelux countries. Taking into account Benelux Recommendation M(2015)10 on cooperation in the field of the deployment of alternative fuels infrastructure ([32]), signed in October 2015 by the three Benelux countries, the aim of this cooperation is to increase the sharing of knowledge and best practice as regards the local deployment of alternative fuels infrastructure by ensuring minimum coverage by the end of 2020, 2025 and 2030.

This Benelux Recommendation focuses in particular on the cross-border aspects of infrastructure deployment. In addition, initiatives relating to infrastructure concessions may require neighbouring countries to cooperate to ensure the coordinated development of sustainable infrastructure, in particular in border regions. Finally, the interoperability of systems and the exchange of information between systems and with citizens in the case of cross-border journeys should also be taken into account.

Furthermore, a political declaration (Annex 12) was signed in December 2017 by the Benelux countries in order to promote unhindered cross-border access to e-mobility services throughout the Benelux. This entails improved interoperability between existing and planned services and the adoption of common standards. At the same time, a letter of intent in the same spirit was signed by the representatives of Luxembourg's e-mobility operators. The aim was to introduce centralised management of recharging station identifiers and non-discriminatory access to these stations (Annex 13).

These two initiatives have made a significant contribution to the European IDACS project, which involves 15 Member States and which has the main objectives of developing a common approach with regard to recharging station identifiers and e-mobility operators, and also providing seamless information on the existence and availability of alternative fuels infrastructure.

Bearing in mind that Benelux cooperation is coordinated by a working group with the support of the Benelux General Secretariat, any opportunity to establish a link with other neighbouring regional projects and to act as facilitator is welcomed. Bringing together various expert networks, legislative incentives and funding opportunities represents a major asset at European level in terms of guaranteeing that strategies are implemented and clean energy is provided for all types of transport.

Table 3-2: Cross-border cooperation

	Electricity	CNG	LNG	Hydrogen	Other

[32] Recommendation of the Benelux Committee of Ministers on cooperation in the field of the deployment of alternative fuels infrastructure – M (2015)10 http://www.benelux.int/files/4814/4896/9787/Bulletin_2015-5_FR.pdf

Belgium & the Netherlands	Benelux Recommendation M(2015)10 on cooperation in the field of the deployment of alternative fuels infrastructure
15 Member States	European IDACS project (ID and Data Collection for Sustainable fuels in Europe)

4. Measures to encourage and facilitate the deployment of recharging points not accessible to the public

The Grand-Ducal Regulation of 7 March 2019 amending the amended Grand-Ducal Regulation of 30 November 2007 on the energy performance of residential buildings and the amended Grand-Ducal Regulation of 31 August 2010 on the energy performance of functional buildings (see Chapter 3.1.10) introduce obligations to equip functional and residential buildings in particular with recharging points for plug-in electric cars (EV) that are not accessible to the public. This was not previously a requirement as equipping existing buildings is often difficult and involves significant installation costs. The situation is particularly problematic with multi-family homes, as the agreement of half of the owners is needed to equip a space with a charging device. The new regulations lay down the following requirements for all new buildings and for the conversion of buildings: for single-family and multi-family homes, indoor parking spaces and covered outdoor spaces must be designed and equipped in such a way that they can subsequently accommodate a charging device for plug-in hybrid or electric vehicles. Where homes only have uncovered outdoor spaces, at least one of these spaces must be designed and equipped in this way. Each parking space must have appropriate pre-cabling or two ducts depending on the proposed cabling concept. One of these ducts must be able to subsequently accommodate an electrical cable leading to the main consumer unit and the other duct must be able to accommodate a data transmission cable leading to the meter cabinet or location of the charging power management system. For multi-family homes, pre-cabling or an additional duct for a data transmission cable must be provided between the termination point of a public communications network operator and the main consumer unit or location of the charging power management system. Depending on the cabling concept chosen, the main consumer unit or, where applicable, the individual consumer units must have a free space so that they can subsequently accommodate additional fuses for the connection of charging devices.

For functional buildings, indoor parking spaces and outdoor spaces must be designed and equipped in such a way that they can subsequently accommodate a charging device for plug-in hybrid or electric vehicles. One in four parking spaces, but at least one parking space if the number of spaces is less than four, must have appropriate pre-cabling or two ducts depending on the proposed cabling concept. One of these ducts must be able to subsequently accommodate an electrical cable leading to the main consumer unit and the other duct must be able to accommodate a data transmission cable leading to the meter cabinet or location of the charging power management system. Pre-cabling or an additional duct for a data transmission cable must be provided between the termination point of a public communications network operator and the main consumer unit or location of the charging power management system. Depending on the cabling concept chosen, the main consumer unit or, where applicable, the individual consumer units must have a free space so that they can subsequently accommodate additional fuses for the connection of charging devices.

5. Measures to promote the deployment of alternative fuels infrastructure for public road transport

In Luxembourg, road-based public transport is essentially split between four main operators. *Autobus de la Ville de Luxembourg* (AVL) operates public transport within the capital city area, with around 30 bus routes. AVL started operating PHEV buses in 2017. These are recharged via a pantograph at the bus terminals. So far, AVL has only operated plug-in hybrid electric buses.

In the south of the country, *Transport Intercommunal de Personnes dans le Canton d'Esch-sur-Alzette* (TICE) operates road transport services between the nine municipalities that form TICE (Dudelange, Differdange, Esch-sur-Alzette, Käerjeng, Kayl, Pétange, Rumelange, Schifflange, Sanem) by means of 17 scheduled bus routes. TICE currently operates a fleet of 55 CNG buses that are refuelled at a CNG station located at the central depot.

Across the rest of the country and along certain cross-border routes, *Régime Général des Transports Routiers* (RGTR) operates a network of around 300 bus routes. Unlike their urban counterparts, most RGTR bus routes involve long journeys between the various regions of Luxembourg. For that reason, the operators of the RGTR network have for a long time used only hybrid buses. Since early 2017, plug-in hybrid buses have been operated on suburban routes in Luxembourg ([33]) and the first BEV buses were introduced in early 2018 ([34]) ([35]). These plug-in electric buses are all quickly recharged via pantographs, either after each journey at the bus terminals or after 1-3 journeys at the depots. In mid-2018, the first 'overnight charging' electric buses were introduced ([36]). These vehicles, whose battery capacity is sufficient to operate the buses throughout the day without needing recharging, have the advantage of their operation being less constrained, such as by the need to recharge between journeys.

A few other municipalities also operate their own bus routes. Some of these municipalities have already started electrifying their vehicles. Since 2017, the four bus routes in the town of Differdange ([37]) have been exclusively served by electric buses that are recharged via pantographs at the bus terminals. Other municipal BEV bus initiatives include the minibuses in the municipality of Mamer, the Citybus in the town of Echternach and the electric school buses in the municipality of Bissen.

Due to all these pilot projects and initiatives by various bus operators and also municipalities, the number of alternative fuel buses, including plug-in electric vehicles, has increased considerably since

[33] https://gouvernement.lu/fr/actualites/toutes_actualites/communiques/2016/12-decembre/20-bausch-station.html

[34] https://gouvernement.lu/fr/actualites/toutes_actualites/communiques/2018/02-fevrier/08-bausch-rgtr.html

[35] https://gouvernement.lu/fr/actualites/toutes_actualites/communiques/2018/10-octobre/01-electrification-rgtr512.html

[36] https://gouvernement.lu/fr/actualites/toutes_actualites/communiques/2018/06-juin/26-bausch-voyagesecker.html

[37] Diffbus https://www.differdange.lu/residents/mobilite/bus/

2016. The bus and coach fleet registered in Luxembourg at the end of 2019 included a large number of alternative fuel buses. Accordingly, around 10% of the 2,186 buses and coaches (categories M2 and M3) registered in Luxembourg, including vehicles not used for public transport, are powered by alternative fuels.

Table 5-1: Registered alternative fuel buses and coaches

	2016	2017	2018	2019
Electric buses and coaches (BEV + PHEV)	**2**	**19**	**55**	**131**
• BEV buses and coaches	2	7	33	108
• PHEV buses and coaches	0	12	22	23
CNG buses and coaches	44	52	52	55
LNG buses and coaches	0	0	0	0
FCEV buses and coaches	0	0	0	0

5.1. Measures for alternative fuels infrastructure for public transport

In order to provide the various PHEV or BEV bus routes, an appropriate recharging infrastructure has had to be installed to ensure that these plug-in electric buses can operate correctly. In particular, recharging points with CCS-type connectors have been installed at bus depots by the bus operators or by the operators of the RGTR network. In order to be able to operate PHEV buses in electric mode or recharge BEV buses after 1-3 journeys, pantographs made by various manufacturers have been installed at bus terminals. This has been done by the Bridges and Roads Agency (*Administration des Ponts et Chaussées*) for RGTR routes, by the City of Luxembourg for AVL routes, and by the town of Differdange for the Diffbus.

The various bus operators allow each other to use the various recharging pantographs so that better use is made of the infrastructure. In particular, at the new transfer points that are currently either under construction or in planning and that are served by the various bus operators, joint operation of the recharging infrastructure is recommended.

5.2. National public transport targets

The operator AVL plans to purchase 17 to 25 BEV buses in 2020. This would mean that 25-30% of the AVL fleet would be BEV or PHEV buses.

In the south of the country, the bus operator TICE plans to gradually expand its CNG bus fleet. It is therefore expected that the number of biogas-powered buses will increase from 55 currently to 60 by 2025.

Unlike their urban counterparts, most RGTR bus routes involve long journeys between the various regions of Luxembourg. For that reason, the operators of the RGTR network have for a long time used only hybrid buses. Since early 2017, plug-in hybrid buses have been operated on suburban routes in Luxembourg and the first BEV buses were introduced in early 2018.

As regards the bus fleet decarbonisation objectives of the operator RGTR, using all types of electric bus (PHEV, BEV with fast-charging pantograph, BEV with overnight charging) and a range of recharging infrastructure has enabled it to better identify the type of bus and the type of recharging infrastructure that are most suited to the various bus routes in the RGTR network. The RGTR has set itself the target of electrifying (BEV, PHEV or FCEV) all the buses and coaches in its fleet by 2030.

Given the initiatives of the various bus operators and the municipalities, ambitious estimates have been made of the number of alternative fuel buses and coaches by 2020, 2025 and 2030.

Table 5-2: Estimated number of alternative fuel buses and coaches

	2020	2025	2030
Electric buses and coaches (BEV + PHEV)	**150**	**750**	**1,500**
• BEV buses and coaches	125	700	1,400
• PHEV buses and coaches	25	50	100
CNG buses and coaches	55	60	65
LNG buses and coaches	0	0	0
FCEV buses and coaches	*	*	*

* Hydrogen is not included in the national policy framework.

In any event, Directive (EU) 2019/1161 of the European Parliament and of the Council of 20 June 2019 amending Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles (38) sets targets for Luxembourg for the deployment of clean buses in public transport. The

[38] Directive (EU) 2019/1161 of the European Parliament and of the Council of 20 June 2019 amending Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles https://eur-lex.europa.eu/legal-content/en/TXT/HTML/?uri=CELEX:32019L1161&from=EN

highest targets are therefore set for Luxembourg, and also Sweden and Denmark, including a rate of 45% of clean buses in calls for tender between 2021 and 2026 and a rate of 65% of clean buses for the period from 2026 to 2030. However, in view of the initiatives already taken by the various operators and the targets that they have announced, the first steps already seem to have been taken to achieve these targets set by the Directive.

Annex 1: General installation plan – Table of park-and-ride facilities where recharging stations are to be installed

Annexe 1: Répartition des bornes de charge publiques pour les parkings relais

Corridor	Localisation du P+R	Ceinture	Rabattement	Interlocuteurs		Nombre bornes de charge
				Responsable Site	Gestionnaire du réseau de distribution (GRD)	
A	Echternach	Frontalière	Bus	Echternach	Creos	7
	Junglinster-Contournement	Régionale	Bus	APC	Creos	3
						10
B	Wasserbillig-Gare	Frontalière	Train	CFL	Creos	5
	Mesenich-Frontière	Frontalière	Bus	APC	Creos	21
	Grevenmacher	Frontalière	Bus	Grevenmacher	Creos	1
	Wecker	Régionale	Train	CFL	Creos	1
	Roodt-Syre	Régionale	Train	CFL	Creos	1
	Munsbach	Régionale	Train	CFL	Creos	1
	Höhenhof	Citadine	Bus/Tram	APC	Creos	55
	Kirchberg	Citadine	Bus	FUAK	Creos	7
						92
C	Oetrange	Régionale	Train	CFL	Creos	1
	Sandweiler/Contern	Régionale	Train	CFL	Creos	1
						2
D	Frisange-Est	Frontalière	Bus	APC	Creos	4
	Frisange-Ouest	Frontalière	Bus	APC	Creos	7
						11
E	Dudelange-Usines	Frontalière	Train	CFL	Creos	1
	Dudelange-Centre	Frontalière	Train	Dudelange	Creos	2
	Dudelange-Ville	Frontalière	Train	CFL	Creos	2
	Rumelange	Frontalière	Train	CFL	Creos	2
	Kayl	Frontalière	Train	CFL	Creos	1
	Bettembourg	Régionale	Train	CFL	Creos	15
	Berchem	Régionale	Train	CFL	Creos	2
	Kockelscheuer	Citadine	Bus	VDL	Creos	8
	Howald-Sud	Citadine	Bus	VDL	Creos	12
	Howald-Fourrière	Citadine	Bus	APC	Creos	15
						60
F	Belval-Université	Frontalière	Train	CFL	Creos	33
	Schifflange	Régionale	Train	CFL	Creos	2
	Cloche d'Or	Citadine	Bus/Tram	APC	Creos	28
	Bouillon	Citadine	Bus	Luxembourg	Creos	34
						97
G	Differdange	Frontalière	Train	Differdange	Creos	4
	Rodange	Frontalière	Train	CFL	Creos	22
	Pétange-Nord	Frontalière	Train	CFL	Creos	4
	Pétange-Sud	Frontalière	Train	Pétange	Creos	1
	Bascharage-Sanem	Régionale	Train	CFL	Creos	3
	Dippach-Reckange	Régionale	Train	CFL	Creos	7
	Leudelange-Gare	Régionale	Train	CFL	Creos	1
						42
H	Steinfort	Frontalière	Bus	APC	Creos	3
	Kleinbettingen	Frontalière	Train	CFL	Creos	2
	Windhof	Frontalière	Train	APC	Creos	7
	Capellen	Régionale	Train	CFL	Creos	1
	Mamer-A6	Régionale	Bus	APC	Creos	7
	Mamer-Gare	Régionale	Train	CFL	Creos	1
	Bertrange-Strassen	Citadine	Train	CFL	Creos	1
						22
I	Schwebach-Pont	Régionale	Bus	APC	Creos	2
	Quatre-Vents	Régionale	Bus	APC	Creos	2
						4
J	Troisvierges	Frontalière	Train	CFL	Creos	3
	Clervaux	Régionale	Train	CFL	Creos	4
	Wilwerwiltz	Régionale	Train	CFL	Creos	1
	Wiltz	Régionale	Train	CFL	Creos	3
	Kautenbach	Régionale	Train	CFL	Creos	1
	Diekirch	Régionale	Train	CFL / Diekirch	Ville de Diekirch	5
	Ettelbruck	Régionale	Train	APC	Ville d'Ettelbruck	7
	Schieren	Régionale	Train	CFL	Creos	1
	Colmar-Berg	Régionale	Train	CFL	Creos	10
	Mersch-Gare	Régionale	Train	CFL	Electris	5
	Mersch-Impasse Kayser	Régionale	Train	APC	Electris	2
	Mersch-Rond-Point	Régionale	Train	APC	Electris	1
	Lintgen	Régionale	Train	CFL	Creos	2
	Lorentzweiler	Régionale	Train	CFL	Creos	2
	Walferdange	Citadine	Train	CFL	Creos	1
	Beggen	Citadine	Bus	VDL	Creos	2
	Dommeldange	Citadine	Train	CFL	Creos	1
	Gare Centrale	Citadine	Train	CFL	Creos	9
						60
	TOTAL PAYS					400

[Key to above table:]

Annexe 1: Répartition des bornes de charge publiques pour les parkings relais	Annex 1: Distribution of public recharging stations at park-and-ride facilities
Corridor	Corridor
Localisation du P+R	Location of P+R
Ceinture	Belt
Rabattement	Mode transfer
Interlocuteurs	Partners
Responsable Site	Site manager
Gestionnaire du réseau de distribution (GRD)	Distribution system operator (DSO)
Nombre bornes de charge	Number of recharging stations
Frontalière	Border
Régionale	Regional
Citadine	Urban
TOTAL PAYS	COUNTRY TOTAL

Annex 2: General installation plan – Table of electric recharging stations at public parking spaces by municipality

Annexe 2: Répartition des bornes de charge publiques pour les parkings publics et les emplacements de stationnement publics communaux

Région de développement		Commune	Gestionnaire du réseau de distribution (GRD)	Nombre de bornes de charge
DICI VDL		Luxembourg	Creos	102
		Hesperange	Creos	10
		Strassen	Creos	7
		Bertrange	Creos	7
		Leudelange	Creos	4
				130
REGION SUD		Käerjeng	Creos	6
		*Belval**	*Creos/Sudstroum*	10
		Bettembourg	Creos	6
		Differdange	Creos	8
		Dudelange	Creos	10
		Esch-sur-Alzette	Sudstroum	17
		Kayl	Creos	3
		Mondercange	Creos	5
		Pétange	Creos	9
		Rumelange	Creos	2
		Sanem	Creos	9
		Schifflange	Creos	5
				90
NORDSTAD		Bettendorf	Creos	1
		Colmar-Berg	Creos	3
		Diekirch	Ville de Diekirch	4
		Erpeldange-sur-Sûre	Creos	2
		Ettelbruck	Ville d'Ettelbruck	5
		Schieren	Creos	1
				16
VALLEE DE L'ALZETTE		Lintgen	Creos	1
		Lorentzweiler	Creos	2
		Mersch	Electris	5
		Steinsel	Creos	3
		Walferdange	Creos	4
				15
AIRREGIOUN		Contern	Creos	4
		Niederanven	Creos	8
		Sandweiler	Creos	4
		Schuttrange	Creos	4
				20
Reste du pays	Mamer Steinfort	Dippach	Creos	3
		Hobscheid	Creos	2
		Kehlen	Creos	4
		Koerich	Creos	2
		Kopstal	Creos	2
		Septfontaines	Creos	1
		Steinfort	Creos	3
		Garnich	Creos	1
		Mamer	Creos	7
		Reckange-sur-Mess	Creos	2
				27
	Clervaux	Clervaux	Creos	3
		Parc Hosingen	Creos	2
		Troisvierges	Creos	2
		Weiswampach	Creos	1
		Wincrange	Creos	3
				11
	Echternach	Beaufort	Creos	1
		Bech	Creos	1
		Berdorf	Creos	1
		Consdorf	Creos	1
		Echternach	Creos	4
		Mompach	Creos	1
		Rosport	Creos	1
		Waldbillig	Creos	1
				11
	Grevenmacher	Betzdorf	Creos	3
		Biwer	Creos	1
		Flaxweiler	Creos	1
		Grevenmacher	Creos	4
		Manternach	Creos	1
		Mertert	Creos	3
		Wormeldange	Creos	2
				15
	Junglinster	Junglinster	Creos	3
		Fischbach	Creos	1
		Heffingen	Creos	1
		Larochette	Creos	1
		Nommern	Creos	1
				7

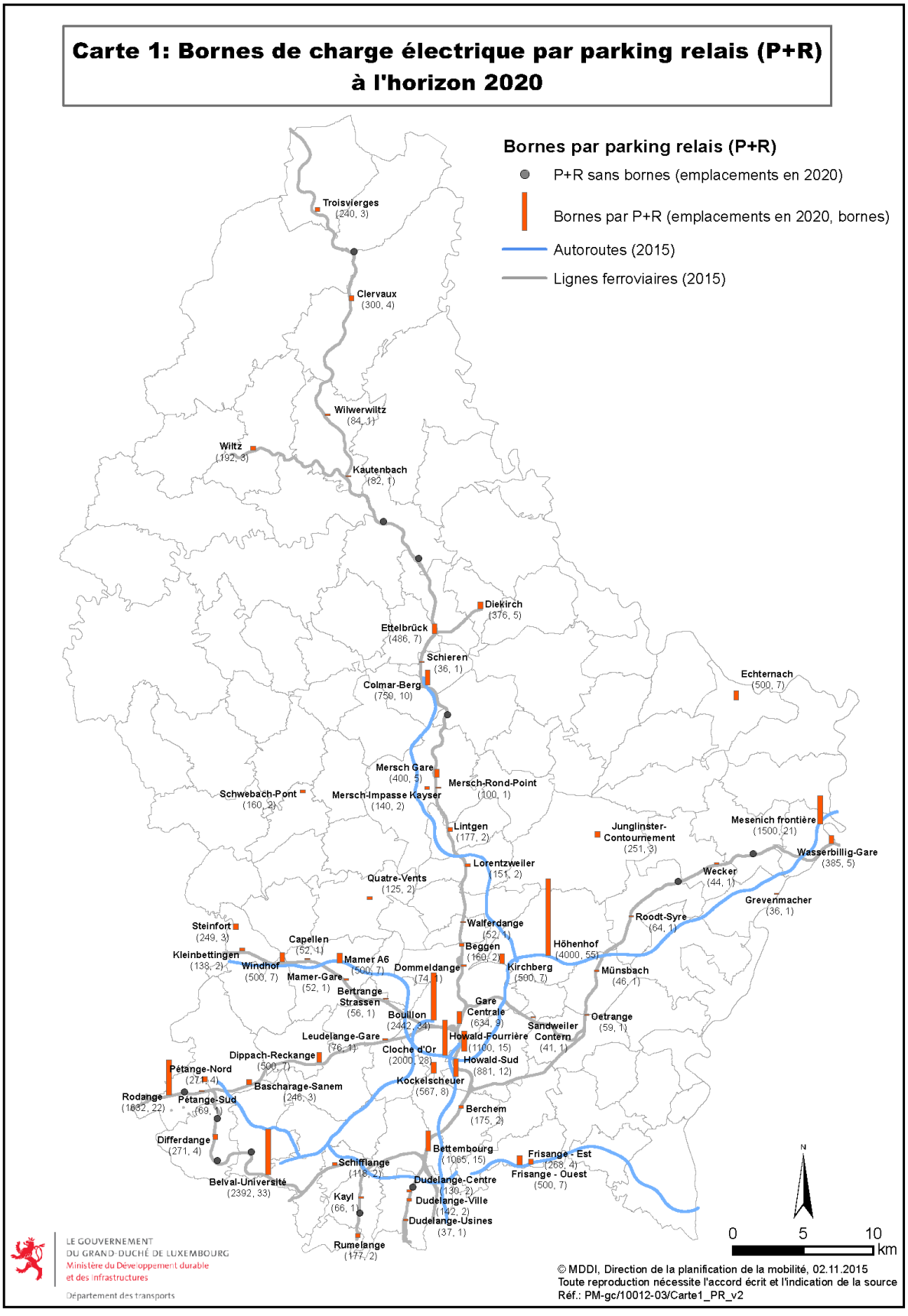
Région de développement		Commune	Gestionnaire du réseau de distribution (GRD)	Nombre de bornes de charge
Reste du pays	Redange	Beckerich	Creos	2
		Ell	Creos	1
		Grosbous	Creos	1
		Préizerdaul	Creos	1
		Rambrouch	Creos	3
		Redange-sur-Attert	Creos	1
		Saeul	Creos	1
		Useldange	Creos	1
		Vichten	Creos	1
		Wahl	Creos	1
		Bissen	Creos	2
		Boevange-sur-Attert	Creos	1
		Tuntange	Creos	1
				17
	Remich Mondorf-les-Bains	Bous	Creos	1
		Dalheim	Creos	1
		Lenningen	Creos	1
		Frisange	Creos	3
		Roeser	Creos	4
		Weiler-la-Tour	Creos	1
		Mondorf-les-Bains	Creos	3
		Remich	Creos	3
		Schengen	Creos	3
		Stadtbredimus	Creos	1
		Waldbredimus	Creos	1
				22
	Wiltz	Boulaide	Creos	1
		Esch-sur-Sûre	Creos	2
		Goesdorf	Creos	1
		Kiischpelt	Creos	1
		Lac de la Haute-Sûre	Creos	1
		Wiltz	Creos	3
		Winseler	Creos	1
		Mertzig	Creos	1
		Bourscheid	Creos	1
		Feulen	Creos	1
				13
	Vianden	Putscheid	Creos	1
		Tandel	Creos	1
		Vianden	Creos	1
		Reisdorf	Creos	1
		Vallée de l'Ernz	Creos	2
				6
TOTAL PAYS				**400**

* Le site de Belval est considéré comme entité à part des communes de Sanem et d'Esch-sur-Alzette.

[Key to above table:]

Annexe 2: Répartition des bornes de charge publiques pour les parkings publics et les emplacements de stationnement publics communaux	Annex 2: Distribution of public recharging stations at public car parks and public parking spaces in municipalities
Région de développement	Development region
Commune	Municipality
Gestionnaire du réseau de distribution (GRD)	Distribution system operator (DSO)
Nombre de bornes de charge	Number of recharging stations
RÉGION SUD	SOUTHERN REGION
Ville de …	Town of …
Reste du pays	Rest of the country
TOTAL PAYS	COUNTRY TOTAL
* Le site de Belval …	* The Belval site is regarded as separate from the municipalities of Sanem and Esch-sur-Alzette.

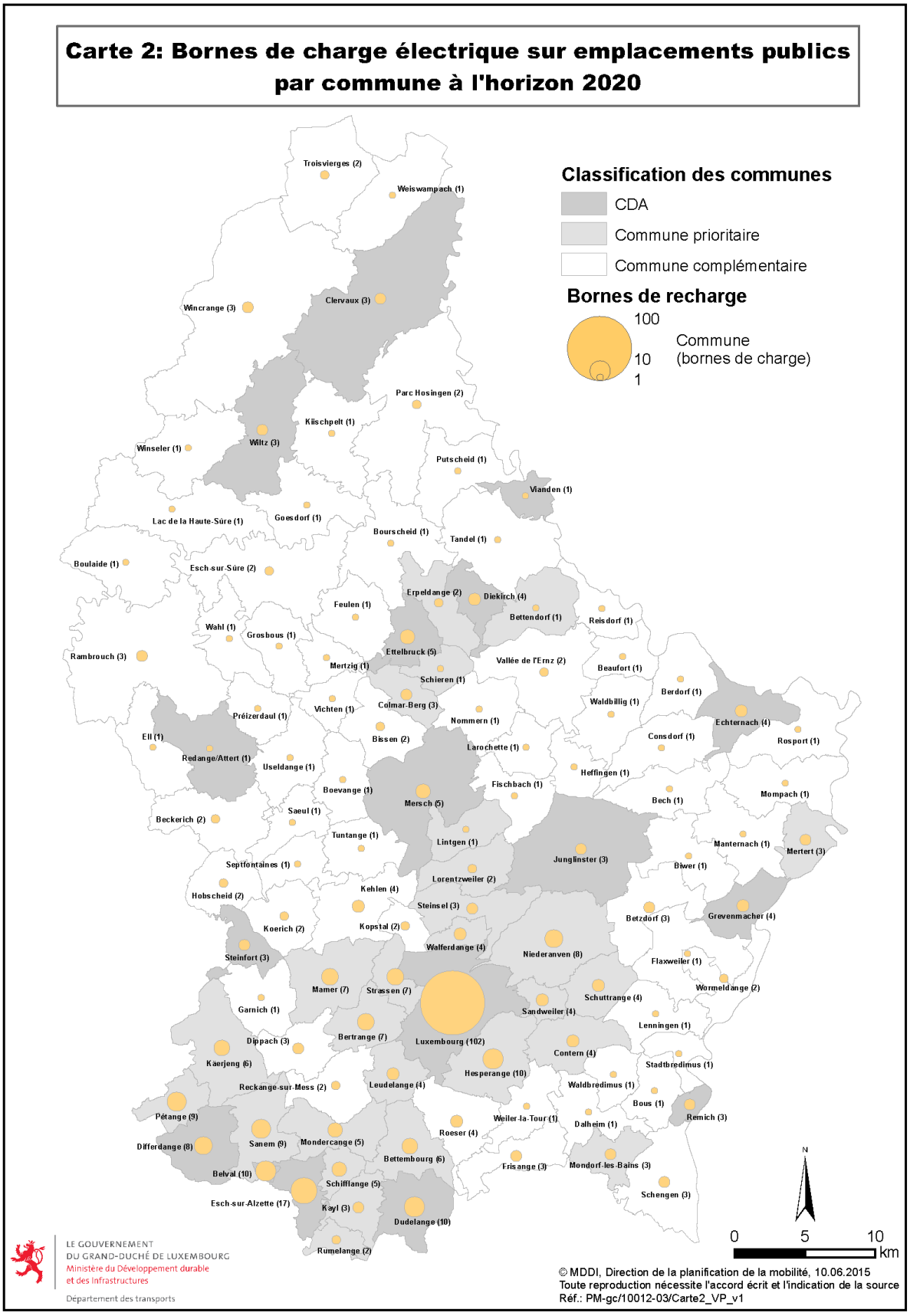
Annex 3: General installation plan – Map of park-and-ride facilities where recharging stations are to be installed



[Key to above map:]

Carte 1: Bornes de charge électrique par parking relais (P+R) à l'horizon 2020	Map 1: Electric recharging stations per park-and-ride facility (P+R) by 2020
Bornes par parking relais (P+R)	Stations per park-and-ride facility (P+R)
P+R sans bornes (emplacements en 2020)	P+R without stations (spaces in 2020)
Bornes par P+R (emplacements en 2020, bornes)	Stations per P+R (spaces in 2020, stations)
Autoroutes	Motorways
Lignes ferroviaires	Railway lines
LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG	THE GOVERNMENT OF THE GRAND DUCHY OF LUXEMBOURG
Ministère du Développement durable et des Infrastructures	Ministry of Sustainable Development and Infrastructure
Département des transports	Department of Transport
MDDI, Direction de la planification de la mobilité	Ministry of Sustainable Development and Infrastructure, Mobility Planning Directorate
Toute reproduction nécessite l'accord écrit et l'indication de la source	Written agreement and an indication of the source is required for any reproduction
Réf.	Reference

Annex 4: General installation plan – Map of electric recharging stations at public parking spaces by municipality



[Key to above map:]

Carte 2: Bornes de charge électrique sur emplacements publics par commune à l'horizon 2020	Map 2: Electric recharging stations at public parking spaces per municipality by 2020
Classification des communes	Classification of municipalities
CDA	Centre of Development and Attraction
Commune prioritaire	Priority municipality
Commune complémentaire	Complementary municipality
Bornes de recharge	Recharging stations
Commune (bornes de charge)	Municipality (recharging stations)
LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG	THE GOVERNMENT OF THE GRAND DUCHY OF LUXEMBOURG
Ministère du Développement durable et des Infrastructures	Ministry of Sustainable Development and Infrastructure
Département des transports	Department of Transport
MDDI, Direction de la planification de la mobilité	Ministry of Sustainable Development and Infrastructure, Mobility Planning Directorate
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Réf.	Reference

Annex 5: Brochure on the application of the new WLTP standard in Luxembourg

POUR MIEUX ÉVALUER LA CONSOMMATION ET LES ÉMISSIONS DE VOTRE VÉHICULE AUTOMOBILE

Le cycle d'essai actuel «Nouveau cycle européen de conduite» (NEDC) avait été conçu dans les années 80 pour déterminer les émissions des véhicules routiers. Étant donné les évolutions en matière de technologie, les conditions de conduite et l'observation d'une discordance croissante entre les émissions réelles mesurées et les émissions déterminées par le cycle d'essai, ce dernier sera remplacé par la World Harmonised Light Vehicle Test Procedure (WLTP) ainsi que par des essais sur route (Real driving emission - RDE).

LA WLTP – C'EST QUOI ?

La WLTP est une nouvelle norme et comprend un cycle de tests internationaux permettant de mesurer avec plus de précision la consommation, les émissions de CO_2, NOx, de particules fines et d'hydrocarbures de votre véhicule automobile. Il s'agit surtout de tenir compte des conditions de conduite plus réalistes et des spécificités du véhicule ; il s'agit donc de considérer autant l'équipement et les accessoires du véhicule ayant un impact sur sa consommation que de tenir compte du fait de la conduite en ville, à la campagne ou sur l'autoroute. La procédure **WLTP** fournit ainsi en combinaison avec les essais de vérification sur route **(RDE)**, des références de mesure plus proches de la réalité par rapport à l'ancien cycle d'essai **NEDC**.

PASSAGE DU NEDC À LA WLTP

À partir du 1er mars 2020, les seuils d'émissions CO_2 en application de la procédure d'essai **WLTP** serviront de base au Luxembourg pour définir les taxes. Cette mise en application se fera de façon transparente et sans pénalisation rétroactive du propriétaire d'un véhicule.

DATES CLÉS

- Pour tous les véhicules dont la 1ère mise en circulation se fait **avant le 1er mars 2020,** la valeur **NEDC** continuera à être appliquée jusqu'à la mise hors circulation définitive du véhicule. Une mise en application des valeurs **WLTP** de manière rétroactive pour ces véhicules n'est **pas** prévue.
- Pour tous les véhicules dont la 1ère mise en circulation se fait **à partir du 1er mars 2020**, la valeur **WLTP** est appliquée.

INCIDENCE SUR LE CALCUL DE LA TAXE SUR LES VÉHICULES ROUTIERS

Pour tout véhicule dont la 1ère mise en circulation est faite **à partir du 1er mars 2020,** le calcul de la taxe sur les véhicules routiers sera basé sur sa consommation et ses émissions mesurées selon la norme **WLTP**. La formule de calcul pour cette taxe reste inchangée. Ainsi la taxe d'une voiture diesel à 120g CO_2 en **WLTP** restera la même que celle pour une voiture diesel à 120g CO_2 en **NEDC**.

INCIDENCE SUR LE CALCUL DE L'AVANTAGE EN NATURE (ATN)

L'avantage en nature **(ATN)** des véhicules de sociétés de catégorie M1 continuera à être déterminé en fonction de la motorisation et des émissions de CO_2 du véhicule. Pour les contrats existants ou signés **jusqu'au 31 décembre 2019** (1ère mise en circulation du véhicule durant l'année 2020), l'**ATN** continuera à être calculé avec les valeurs **NEDC**.
Pour les voitures immatriculées **durant l'année 2020** (sans contrat signé jusqu'au 31 décembre 2019), l'**ATN** sera calculé en 2020 avec les valeurs **NEDC** et à partir de 2021 avec les valeurs **WLTP**.
Pour toutes les voitures immatriculées **à partir du 1er janvier 2021**, l'**ATN** sera calculé en fonction des valeurs **WLTP**.

CLEVER FUEREN Sue spueren

INCIDENCE SUR LES PRIMES POUR VÉHICULES À FAIBLES ÉMISSIONS DE CO_2

Afin qu'un véhicule **Plug-in hybride** soit éligible pour la **prime d'achat** de 2.500€, il faut que ses émissions de CO_2 soient inférieures ou égales à 50g/km. Si la 1ère mise en circulation du véhicule a été faite **avant le 1er juin 2020,** la valeur **NEDC** sera utilisée comme référence pour évaluer si la prime d'achat peut être accordée. Les véhicules Plug-in hybrides qui sont immatriculés **à partir du 1er juin 2020** seront exclusivement évalués en fonction de la norme **WLTP**. L'obtention de la prime d'achat sera toujours soumise au critère des émissions de CO_2 devant être inférieures ou égales à 50g/km, mais mesurées maintenant sur base de la norme **WLTP**.

POUR PLUS D'INFORMATIONS

- Pour plus d'informations sur la nouvelle norme WLTP, veuillez consulter le site **www.wltp.lu**
- Découvrez toutes les informations sur les primes pour une mobilité durable sur **www.cleverfueren.lu**

LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de la Mobilité et des Travaux publics

www.wltp.lu

[Key to above graphic:]

IMPROVING THE MEASUREMENT OF YOUR VEHICLE'S CONSUMPTION AND EMISSIONS

The current test cycle – the New European Driving Cycle (NEDC) – was developed in the 1980s to measure the emissions of road vehicles. Given developments in technology, current driving conditions and an increasing divergence between real-world emissions and emissions measured by the test cycle, this will be replaced by the Worldwide Harmonised Light Vehicle Test Procedure (WLTP) and road tests (Real Driving Emissions – RDE).

WHAT IS THE WLTP?

The WLTP is a new standard consisting of a cycle of international tests allowing the consumption and the CO_2, NO_x, fine particle and hydrocarbon emissions of your motor vehicle to be measured more accurately. It is in particular based on more realistic driving conditions and the specific features of vehicles. As a result, the equipment and accessories of vehicles that have an impact on consumption are taken into account just as much as the way in which vehicles are driven in town, in the countryside and on motorways. In combination with the RDE road tests, the WLTP therefore provides measurements that are closer to reality than the former NEDC test cycle.

TRANSITION FROM THE NEDC TO THE WLTP

From 1 March 2020, the CO_2 emission thresholds under the WLTP will be used in Luxembourg to calculate the taxes due. This system will be applied transparently and without retroactively penalising vehicle owners.

KEY DATES

- For all vehicles that first enter into service **before 1 March 2020**, the **NEDC** value will continue to be applied until the vehicle is scrapped. It is not planned to retroactively apply the **WLTP** values to such vehicles.
- For all vehicles that first enter into service **on or after 1 March 2020**, the **WLTP** value will be applied.

EFFECT ON THE CALCULATION OF ROAD VEHICLE TAX

For any vehicle that first enters into service **on or after 1 March 2020**, road vehicle tax will be calculated based on its consumption and emissions measured according to the **WLTP** standard. The calculation formula for this tax will not change. As a result, the tax for a diesel car with 120 g CO_2 under **WLTP** will remain the same as that for a diesel car with 120 g CO_2 under **NEDC**.

EFFECT ON THE CALCULATION OF BENEFIT IN KIND (BIK)

Benefit in kind (**BIK**) for category M1 company vehicles will continue to be based on the engine and CO_2 emissions of the vehicle. For existing contracts or contracts signed up to **31 December 2019** (first entry into service of the vehicle in 2020), **BIK** will continue to be calculated using the **NEDC** values.

For cars registered in **2020** (contract not signed until after 31 December 2019), **BIK** will be calculated in 2020 using the **NEDC** values and from 2021 using the **WLTP** values.

For all cars registered **on or after 1 January 2021**, **BIK** will be calculated using the **WLTP** values.

CLEVER FUEREN

Sue spueren
(DRIVE SMART, Save money)

EFFECT ON BONUSES FOR LOW CO_2 EMISSION VEHICLES

In order for a **Plug-in Hybrid Electric Vehicle** to be eligible for the **purchase bonus** of €2,500, its CO_2 emissions must be 50 g/km or less. If the vehicle first enters into service **before 1 June 2020**, the **NEDC** value will be used to assess whether the purchase bonus can be granted. Plug-in Hybrid Electric Vehicles that are registered **on or after 1 June 2020** will be assessed according to the **WLTP** standard only. In all cases, the purchase bonus will only be granted if the CO_2 emissions are 50 g/km or less, but in the future these will be measured based on the **WLTP** standard.

FOR MORE INFORMATION

- For more information on the new WLTP standard, go to www.wltp.lu
- Find out all about the sustainable mobility bonuses at www.cleverfueren.lu

THE GOVERNMENT OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of Mobility and Public Works

Annex 6: Overview of tax allowances introduced in 2017/2018 to promote zero or low emission vehicles

[Key to above graphic:]

TAX REFORM 2017/18	***For sustainable transport***

TAX REFORM FOR SUSTAINABLE MOBILITY

In 2018 an allowance for private plug-in hybrid electric vehicles with ≤ 50 g CO_2/km will be added to the tax measures introduced for private battery electric vehicles, bicycles and pedelecs25 (e-bikes).

€5,000 **BATTERY ELECTRIC VEHICLE**	**NEW!** **€2,500** **PLUG-IN HYBRID ELECTRIC VEHICLE** **≤ 50 g CO_2/KM** **FROM 01/01/18**	**€300** **BICYCLES AND PEDELECS25**

- The allowances of €5,000 for private battery electric cars and €2,500 for private plug-in hybrid electric cars cannot be combined.
- Only one of these allowances (€5,000 or €2,500) can be combined with an allowance of €300 for a bicycle or a pedelec25.

AT THE SAME TIME

800 stations with 1,600 recharging points accessible to the public for battery electric vehicles and plug-in hybrid electric vehicles will be installed by the end of 2020.

For more information: www.chargy.lu

Annex 7: Assessment grid for calculating benefit in kind for company cars

STEIERREFORM 2017/18 *Fir nohaltegen Transport*

UNE RÉFORME FISCALE POUR UNE MOBILITÉ DURABLE

Réévaluation de l'avantage en nature forfaitaire pour les voitures, vélos et pedelecs25 de fonction.

VOITURE DE FONCTION

CATÉGORIES D'ÉMISSIONS DE CO_2	Pourcentage de la valeur du véhicule (neuf TVA comprise)/véhicules de la catégorie M1		
	Véhicule sans motorisation Diesel	Véhicule avec motorisation Diesel	Véhicule 100% électrique
0 g/km			0,5
> 0-50 g/km	0,8	1,0	
> 50-110 g/km	1,0	1,2	
> 110-150 g/km	1,3	1,5	
> 150 g/km	1,7	1,8	

VÉLO ET PEDELEC25 DE FONCTION

L'avantage en nature d'un cycle au sens du code de la route (vélos et pedelecs25) est non imposable.

· La mise à disposition par l'employeur d'un vélo ou d'un pedelec25 de fonction avec celle d'une voiture de fonction est possible.

[Key to above graphic:]

TAX REFORM 2017/18		***For sustainable transport***	
TAX REFORM FOR SUSTAINABLE MOBILITY Reassessment of flat-rate benefit in kind for company cars, bicycles and pedelecs25.			
LEASING COMPANY CAR			
CO_2 EMISSION CATEGORIES			
	Percentage of the vehicle's value (new including VAT) for category M1 vehicles		
	Vehicle without diesel engine	Vehicle with diesel engine	Battery electric vehicle
0 g/km			0.5
> 0-50 g/km	0.8	1.0	
> 50-110 g/km	1.0	1.2	
> 110-150 g/km	1.3	1.5	
> 150 g/km	1.7	1.8	
LEASING COMPANY BICYCLES AND PEDELECS25			
Benefit in kind for a cycle within the meaning of the Highway Code (bicycles and pedelecs25) is not taxable.			
- The employer can provide a company bicycle or pedelec25 together with a company car.			

Annex 8: Poster for the new purchase bonus for BEV cars

PROLONGATION

PRIMES POUR VÉHICULES ÉLECTRIQUES

5.000 €

POUR TOUTE NOUVELLE VOITURE/CAMIONNETTE
100% ÉLECTRIQUE*

2.500 €

POUR TOUTE NOUVELLE VOITURE/CAMIONNETTE
PLUG-IN HYBRIDE
(≤ 50 G CO_2/KM)**

Conditions d'éligibilité :

- sont éligibles les personnes physiques et les personnes morales de droit privé ;
- la prime est accordée au propriétaire de la voiture ;
- en cas de leasing, la prime peut être accordée au détenteur ;
- véhicule mis en circulation pour la première fois entre le 1er janvier 2019 et le 31 décembre 2020 et pas encore immatriculé à l'étranger ;
- durée de détention minimale du véhicule de 7 mois au Grand-Duché par le requérant ;
- cette prime est cumulable avec d'autres primes.

* Conformément à l'approche neutre du point de vue technologique du gouvernement en matière de véhicules à zéro émissions de roulement, les voitures et camionnettes à pile à combustible à hydrogène sont aussi éligibles pour la prime de 5.000 euros.

** Pour les véhicules hybrides «plug-in» mis en circulation pour la première fois à partir du 1er juin 2020, ce sont les valeurs combinées des émissions de CO_2 du cycle d'essai WLTP qui sont prises en compte.

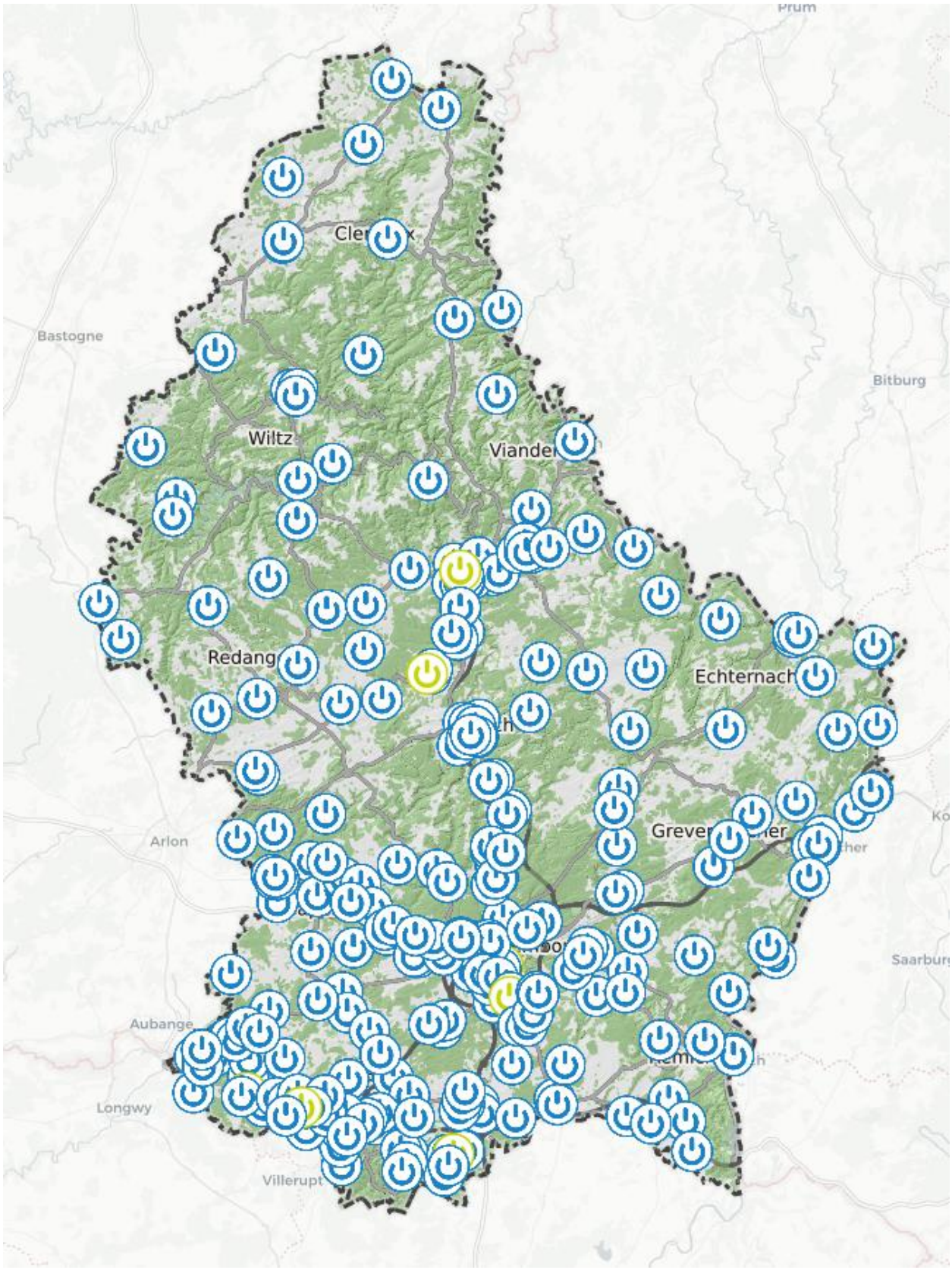
Plus d'informations et autres conditions sur
www.clever-fueren.lu

LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Environnement, du Climat
et du Développement durable

[Key to above graphic:]

CLEVER FUEREN ***Sue spueren*** **(DRIVE SMART, Save money)**	
EXTENSION **BONUSES FOR ELECTRIC VEHICLES**	
€5,000 **FOR ANY NEW BATTERY ELECTRIC* CAR/VAN**	**€2,500** **FOR ANY NEW PLUG-IN HYBRID ELECTRIC CAR/VAN** **(≤ 50 G CO_2/KM)****
Eligibility conditions: • Individuals and private companies are eligible. • The bonus is granted to the car owner. • In the case of leasing, the bonus can be granted to the vehicle keeper. • Vehicles that first enter into service between 1 January 2019 and 31 December 2020 and are not registered abroad. • The applicant must keep the vehicle in the Grand Duchy for at least 7 months. • This bonus can be combined with other bonuses. * In line with the government's technologically neutral approach to zero emission vehicles, fuel cell electric cars and vans are also eligible for the €5,000 bonus. ** For plug-in hybrid electric vehicles that first enter into service on or after 1 June 2020, the combined CO_2 emission values of the WLTP test cycle will be used.	
For more information and other conditions: **www.clever-fueren.lu**	THE GOVERNMENT OF THE GRAND DUCHY OF LUXEMBOURG Ministry of the Environment, Climate and Sustainable Development

Annex 9: 'CHARGY' and 'CHARGY OK' recharging stations available in 2019



Annex 10: Extracts on alternative fuels from the Modu 2.0 mobility strategy

LES CARBURANTS ALTERNATIFS

Le Grand-Duché entame sa transition vers un parc automobile à zéro ou à faibles émissions de roulement.

Véhicules privés, de leasing et d'entreprise
Pour les particuliers, le gouvernement a mis en place un abattement fiscal de 5 000 € pour véhicules à zéro émissions de roulement (voiture électrique et voiture à pile à combustible à hydrogène), de 2 500 € pour les voitures plug-in hybrides à moins de 50 g de CO_2/km et de 300 € pour les vélos et pedelecs25. L'imposition des véhicules de leasing et des voitures d'entreprise privilégie également les carburants alternatifs.

www.clever-fueren.lu

Infrastructure publique à recharge électrique
Jusqu'en 2020, un réseau national de 1 600 points de charge « Chargy » pour les voitures électriques et plug-in hybrides sera mis en place par les gestionnaires de réseaux de distribution. Les points de charge sont uniquement alimentés par de l'électricité générée exclusivement à partir d'énergies renouvelables. Ils sont équipés de prises Type 2 et ont une puissance de charge pouvant atteindre 22 kW.

www.chargy.lu

Emplacements de stationnement avec borne « Chargy » (MDDI)

Taxis et bus
A la suite de la réforme sur le marché des taxis en 2016, seuls les véhicules à zéro émission de roulement sont éligibles pour obtenir des licences supplémentaires. Fin 2017, 38 taxis électriques étaient immatriculés (7,4 % de la flotte). Cette mesure contribue à atteindre les objectifs en matière d'émissions de NO_x en milieu urbain imposés par l'Union européenne. Il en est de même pour les projets pilotes avec des bus plug-in hybrides et électriques qui ont été initiés en 2017 par le RGTR et les Villes de Luxembourg, de Differdange et d'Echternach.

Voitures de l'Etat
Une flotte d'environ 2 000 véhicules est opérée directement par les ministères et les administrations. En 2017, un projet-pilote a été initié pour recourir davantage à des voitures électriques. A partir de 2018, toutes les nouvelles voitures de l'Etat doivent être électriques ou plug-in hybrides, sauf dérogation justifiée.

« AVEC AU MOINS DEUX POINTS DE CHARGE PAR COMMUNE ET PLUS DE 800 POINTS DE CHARGE AUX PARK AND RIDE, LE LUXEMBOURG POSSÉDERA EN 2020 LE RÉSEAU DE POINTS DE CHARGE ACCESSIBLES AU PUBLIC LE PLUS DENSE DE L'UNION EUROPÉENNE. »

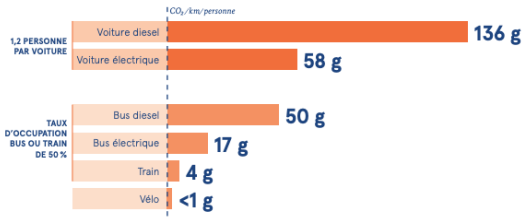
Bus électrique de la Ville de Luxembourg (MDDI)

« Sur un cycle de vie complet de 200 000 km, une voiture électrique (remplacement des batteries inclus) produit moins de la moitié du CO_2 émis par une voiture diesel. Cet écart s'accentuera avec l'essor des énergies renouvelables. »

Une politique technologiquement neutre

Le gouvernement ne favorise pas un seul carburant alternatif, en l'occurrence l'électromobilité. Dès lors, d'autres carburants alternatifs pourront aussi contribuer à rendre le transport routier plus propre. Par exemple, si la production d'hydrogène par électrolyse avec de l'électricité générée exclusivement à partir d'énergies renouvelables devenait compétitive, des véhicules avec pile à combustible à hydrogène pourraient jouer un rôle important.

Emissions de CO_2 par personne transportée pour un cycle de vie complet de 200 000 km par véhicule motorisé
(Mobitool.ch et Transport & Environment, 2017)



« Well-to-Tank »

Il s'agit des émissions occasionnées avant même le déplacement du véhicule pour produire (« well ») et acheminer le carburant jusque dans le réservoir (« tank »). Toute production de carburant, même celle d'électricité à partir d'énergies renouvelables, donne lieu à des émissions « well-to-tank ».

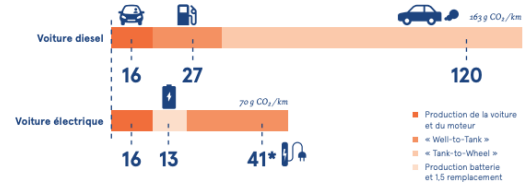
Pour comparer les émissions de CO_2 pour un cycle de vie complet de deux véhicules différents, il faut également prendre en compte les émissions dues à la production de la voiture elle-même et, dans le cas des voitures électriques, celles dues à la production de la batterie, voire des batteries de remplacement.

Pas de pot d'échappement (MDDI)

« Tank-to-Wheel »

Il s'agit des émissions produites localement par le moteur du véhicule pour transférer une partie de l'énergie contenue dans la batterie ou le réservoir (« tank ») aux roues (« wheel »). Les voitures électriques et celles à pile à combustible à hydrogène, caractérisées par l'absence de pot d'échappement, ont l'avantage de ne pas produire d'émissions locales « tank-to-wheel » de polluants atmosphériques liées à la combustion (CO_2, NO_x, SO_x, particules fines, etc.). Elles émettent uniquement le tiers des particules fines qui est dû à l'abrasion des freins et des pneus.

Emissions de CO_2 pour un cycle de vie complet du véhicule de 200 000 km
(Transport & Environment, 2017)



** 203 g CO_2/kWh pour l'électricité consommée au Luxembourg (ILR, 2016). Les émissions de CO_2 « well-to-tank » pour une voiture électrique avec une consommation de 20 kWh/100 km s'élèvent alors à 40,6 g/km.*

[Key to above graphics:]

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ALTERNATIVE FUELS *The Grand Duchy is starting the switch to zero or low emission vehicles*	
Private, lease and company vehicles For individuals, the government has introduced a tax allowance of €5,000 for zero emission vehicles (battery electric cars and fuel cell electric cars), €2,500 for plug-in hybrid electric cars with less than 50 g CO_2/km, and €300 for bicycles and pedelecs25. The taxation of lease vehicles and company cars also favours alternative fuels. **www.clever-fueren.lu**	**Public electric recharging infrastructure** By the end of 2020, a national network of 1,600 'Chargy' recharging points for battery electric and plug-in hybrid electric cars will have been installed by distribution system operators. The recharging points will only be supplied with electricity generated from renewable energy. They will be equipped with Type 2 connectors and have a recharging power of up to 22 kW. **ww.chargy.lu**
CLEVER FUEREN *Steire spueren* (DRIVE SMART, Save tax)	*Parking spaces with 'Chargy' station (Ministry of Sustainable Development and Infrastructure)*

[Top right side of page]

Taxis and buses Following the reform of the taxi market in 2016, only zero emission vehicles are eligible to obtain additional licences. At the end of 2017, 38 electric taxis were registered (7.4% of the fleet). This measure will help to achieve NO_x emission targets in urban environments, as imposed by the European Union. The same is true of the pilot projects involving plug-in hybrid electric and battery electric buses that were initiated in 2017 by the RGTR and the Cities of Luxembourg, Differdange and Echternach.	**Government cars** A fleet of around 2,000 vehicles is operated directly by the ministries and authorities. In 2017, a pilot project was initiated to use more electric vehicles. Since 2018, all new government cars must be battery electric or plug-in hybrid electric, except where an exemption is justified.
'WITH AT LEAST TWO RECHARGING POINTS PER MUNICIPALITY AND OVER 800 RECHARGING POINTS AT PARK-AND-RIDE FACILITIES, LUXEMBOURG WILL HAVE THE HIGHEST DENSITY NETWORK OF PUBLICLY ACCESSIBLE RECHARGING POINTS IN THE EUROPEAN UNION IN 2020.'	*Electric bus in the City of Luxembourg (Ministry of Sustainable Development and Infrastructure)*

[Bottom left side of page]

'In a complete lifecycle of 200,000 km, an electric car (even including the replacement of batteries) produces less than half of the CO_2 emitted by a diesel car. This difference will increase with the growth in renewable energy.'	**A technologically neutral policy** The government is not favouring just one alternative fuel, i.e. electromobility. Other alternative fuels can therefore help to make road transport cleaner. For example, if the production of hydrogen by electrolysis using electricity generated solely from renewable energy becomes competitive, fuel cell electric vehicles could play a major role.

CO_2 emissions per person transported for a complete lifecycle of 200,000 km per motor vehicle
(Mobitool.ch and Transport & Environment, 2017)

		CO_2/km/person
1.2 PERSONS PER CAR	Diesel car	
	Electric car	
50% OCCUPANCY RATE OF BUS OR TRAIN	Diesel bus	
	Electric bus	
	Train	
	Bicycle	

[Bottom right side of page]

'Well-to-Tank' These are emissions generated even before the vehicle moves in order to produce ('well') and transport the fuel to the vehicle's tank ('tank'). Any production of fuel, even electricity from renewable energy, generates 'well-to-tank' emissions. In order to compare CO_2 emissions for a complete lifecycle of two different vehicles, the emissions due to the production of the car itself and, in the case of electric cars, those due to the production of the battery and also replacement batteries must also be taken into account.	*No exhaust pipe (Ministry of Sustainable Development and Infrastructure)*
	'Tank-to-Wheel' These are emissions generated locally by the vehicle's engine in order to transfer part of the energy contained in the battery or tank ('tank') to the wheels ('wheel'). Battery electric and fuel cell electric cars, which are characterised by the absence of an exhaust pipe, have the advantage of producing no 'tank-to-wheel' local emissions of air pollutants connected with combustion (CO_2, NO_x, SO_x, fine particles, etc.). They emit only one-third of the fine particles, which are due to the abrasion of the brakes and tyres.
CO_2 emissions for a complete vehicle lifecycle of 200,00 km	

(Transport & Environment, 2017)

Diesel car
Electric car

- Production of the car and engine
- 'Well-to-Tank'
- 'Tank-to-Wheel'
- Production of battery and 1.5 replacements

** 203 g CO_2/kWh for electricity consumed in Luxembourg (ILR, 2016). 'Well-to-tank' CO_2 emissions for an electric car with a consumption of 20 kWh/100 km are therefore 40.6 g/km.*

Annex 11: Extracts from the myenergy brochure '*Comment charger votre voiture électrique*'

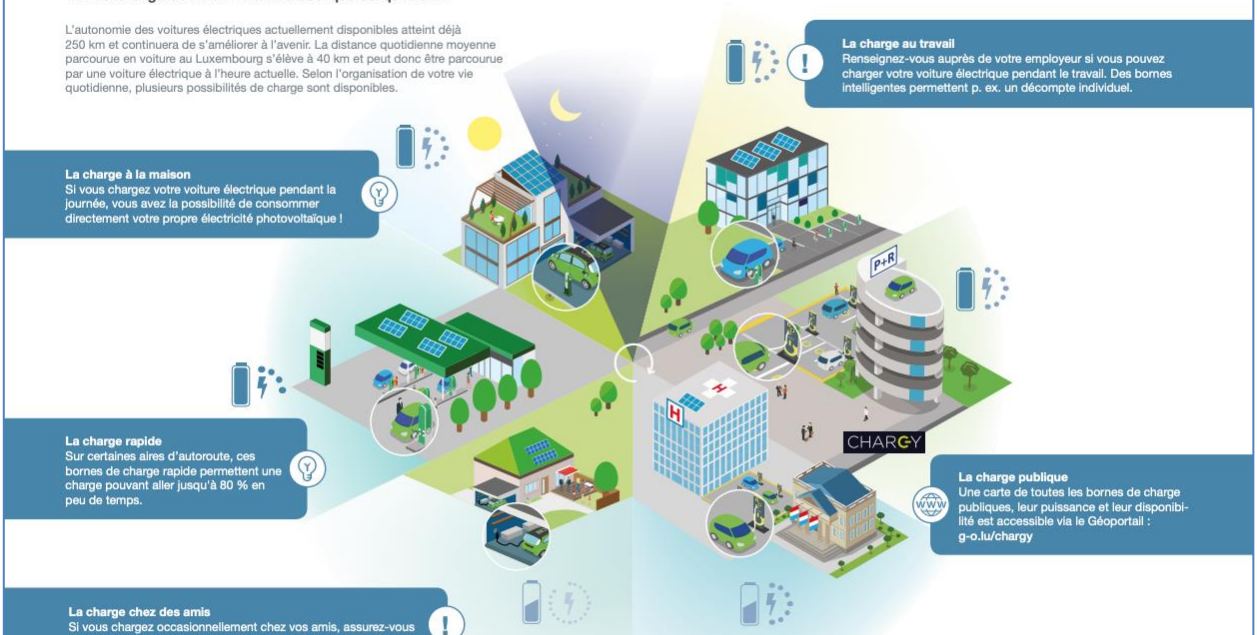
Comment charger votre voiture électrique ?

1.1. La charge de votre voiture électrique au quotidien

L'autonomie des voitures électriques actuellement disponibles atteint déjà 250 km et continuera de s'améliorer à l'avenir. La distance quotidienne moyenne parcourue en voiture au Luxembourg s'élève à 40 km et peut donc être parcourue par une voiture électrique à l'heure actuelle. Selon l'organisation de votre vie quotidienne, plusieurs possibilités de charge sont disponibles.

La charge au travail
Renseignez-vous auprès de votre employeur si vous pouvez charger votre voiture électrique pendant le travail. Des bornes intelligentes permettent p. ex. un décompte individuel.

La charge à la maison
Si vous chargez votre voiture électrique pendant la journée, vous avez la possibilité de consommer directement votre propre électricité photovoltaïque !



La charge rapide
Sur certaines aires d'autoroute, ces bornes de charge rapide permettent une charge pouvant aller jusqu'à 80 % en peu de temps.

La charge publique
Une carte de toutes les bornes de charge publiques, leur puissance et leur disponibilité est accessible via le Géoportail : g-o.lu/chargy

La charge chez des amis
Si vous chargez occasionnellement chez vos amis, assurez-vous que la prise peut supporter la charge de votre voiture électrique.

2. Recommandations pour l'installation d'une borne de charge murale à domicile

Pour des raisons de confort et de sécurité, il est recommandé d'installer une borne de charge murale pour votre usage privé dans votre maison lors de l'acquisition d'une voiture électrique. Une protection contre les surcharges et un maniement confortable sont ainsi garantis. De plus, la borne de charge murale permet l'utilisation future de fonctionnalités supplémentaires, p. ex. la consommation de votre propre électricité photovoltaïque ou une charge décalée dans le temps.

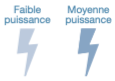
2.1. Aspects légaux et adaptations constructives

En raison de l'importance de la charge à domicile, un cadre légal est en train d'être élaboré pour harmoniser l'infrastructure de charge « privée » afin de faciliter l'accès à une borne de charge à un grand nombre de propriétaires et de locataires. Ce cadre se réfère surtout à la création de conduits vides, ainsi qu'au câblage de la borne vers le compteur intelligent (smart meter). Pour plus de détails sur les procédures d'installation d'une borne de charge murale, merci de vous référer aux pages 16 à 19.

Selon les conditions de raccordement des gestionnaires de réseau, tous les travaux d'installation doivent être réalisés par un électricien qualifié qui peut vous conseiller pour déterminer la solution la plus adaptée à votre cas.

2.2. Recommandations techniques

– La puissance de charge maximale résulte de la puissance de votre raccordement domestique et devrait être adaptée à vos besoins. Dans le cas d'un raccordement domestique habituel (maison unifamiliale) avec 27 kW (40 ampères), une puissance de charge maximale de 11 kW est recommandée. Une puissance de charge plus forte nécessite une augmentation de la puissance payante de votre raccordement domestique.



– La borne doit posséder une jonction ou un relais en amont permettant un câblage vers le compteur intelligent (smart meter). À partir d'une puissance de 7 kW, cette connexion est une exigence du gestionnaire de réseau, afin que ce dernier puisse temporairement réduire la puissance ou débrancher la borne en cas de panne de réseau pour éviter des dommages (p. ex. défaillance d'infrastructures sensibles telles que les congélateurs).

– Pour permettre l'utilisation de fonctionnalités supplémentaires comme p. ex. une charge décalée dans le temps, il convient de veiller à la disponibilité de la connexion internet avec la borne de charge murale par téléphonie mobile (en cas de réseau mobile) ou (W)LAN.

Si un décompte des charges est nécessaire (p. ex. sur le lieu de travail ou dans une résidence), la borne doit posséder une connexion mobile.

[Key to above graphics:]

How to charge your electric car **1.1. Charging your electric car on a daily basis** The range of the electric cars that are currently available is already 250 km and will continue to improve in the future. The average daily distance travelled in a car in Luxembourg is 40 km, which is therefore within the range of current electric cars. Depending on how your daily life is organised, several charging possibilities are available. **Charging at home** If you charge your electric car during the daytime, you can directly use your own photovoltaic electricity! **Fast/rapid charging** At certain motorway service areas, these fast/rapid recharging stations allow electric cars to be charged up to 80% in a short space of time. **Charging at friends' houses** If you occasionally charge your electric car at your friends' houses, check that the socket can cope with charging your car.	**Charging at work** Check with your employer if you can charge your electric car during worktime. Smart stations enable individual metering for example. **Public charging** The Geoportal **g-o.lu/chargy** has a map of all public recharging stations, their power and their availability.				
	Full charge	Short charge	Low power	Medium power	High power
How to charge your electric car					

2. Recommendations for installing a wall-mounted recharging station at home For reasons of convenience and security, it is recommended that you install a wall-mounted recharging station at home, for your private use, when you purchase an electric car. Surge protection and ease of use are therefore guaranteed. In addition, the wall-mounted recharging station will allow the future use of additional functions, such as the consumption of your own photovoltaic electricity or time-delayed charging. **2.1. Legal aspects and structural changes** Due to the importance of home charging, a legal framework is currently being drawn up to standardise 'private' recharging infrastructure so that as many owners and tenants as possible can easily access a recharging station. In particular this framework covers the installation of empty ducts and the cabling of the station to the smart meter. For more details on installation procedures for a wall-mounted recharging station, please refer to pages 16 to 19. Depending on the connection conditions of system operators, all installation work must be carried out by a qualified electrician who can advise you on the most appropriate solution in your case.	**2.2. Technical recommendations** - The maximum charging power is determined by the power of your domestic connection and should be suited to your needs. In the case of a standard domestic connection (single-family house) at 27 kW (40 amps), a maximum charging power of 11 kW is recommended. A higher charging power needs an increase in the chargeable power of your domestic connection. Low power Medium power - The station must have an upstream junction or relay allowing for cabling to the smart meter. Above a power of 7 kW, this connection is a requirement of the system operator so that the latter can temporarily reduce the power or disconnect the station in the event of a power failure in order to prevent damage (e.g. failure of sensitive equipment such as freezers). - To allow the use of additional functions such as time-delayed charging, the wall-mounted recharging station should be connectable to the internet via mobile telephony (in the case of a mobile network) or (W)LAN. If the consumption needs to be metered (e.g. at the workplace or in a residence), the station must have a mobile connection.
Recommendations for installing a wall-mounted recharging station at home	

Annex 12: Political declaration on borderless access to e-mobility services within the Benelux

POLITICAL DECLARATION ON BORDERLESS ACCESS TO E-MOBILITY SERVICES WITHIN THE BENELUX

Considering:

- The 2030 EU climate and energy framework, which sets three key targets for the year 2030: at least 40% cuts in greenhouse gas emissions (from 1990 levels), at least 27% share for renewable energy and at least 27% improvement in energy efficiency;
- The European Commission's Communication "Towards the broadest use of alternative fuels – an Action Plan on Alternative Fuels Infrastructure" of 8 November 2017, supporting collaboration between public and private actors regarding access to timely, reliable information about the location and availability of recharging or refueling points, as well as seamless and interoperable payment services;
- The European Commission's Communication "An agenda for a socially fair transition towards clean, competitive and connected mobility for all" of 31 May 2017, according to which the deployment of a network of recharging points covering evenly the whole EU road network, represents another key enabling condition for zero- emission mobility;
- The European Commission's Communication "A European Strategy for Low-Emission Mobility" of 20 July 2016, according to which further effort should be made to foster the creation of an EU-wide e-mobility services market, such as the cross-border interoperability of payments and the provision of real-time information on charging points;
- The outcome of the Paris Conference of Parties in December 2015, and in particular the adoption of a new legally-binding climate Agreement with the aim of holding global warming well below 2°C and of pursuing efforts to limit it to 1.5°C;
- Recommendation M(2015)10 of the Benelux Committee of Ministers of 19 October 2015 on cooperation in the field of the deployment of alternative fuels infrastructure;
- Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure;
- The European Commission's Communication "Clean Power for Transport: A European alternative fuels strategy" of 24 January 2013, aiming to facilitate the development of a single market for alternative fuels for transport in Europe.

Taking into account:

- Electricity has the potential to increase the energy efficiency of road vehicles and to contribute to a CO_2 reduction in transport and improve air quality;
- The development of electric vehicles (EV) is correlated to the access to charging infrastructure and services;
- The Benelux-region counts in June 2017 a quarter of all registered plug-in hybrid/battery electric passenger cars and almost a third of EV charging points in the EU-28;

1/3

- The e-mobility market of services provides the EV-driver with solutions for locating and accessing EV charging points, user-identification and payment;
- The importance of regional cooperation for the deployment of alternative fuels infrastructure;
- The potential of the Benelux region as frontrunners in the cross-border deployment of e-mobility market of services.

Recognizing:

- The recommendations of the report of the Sustainable Transport Forum's sub-group to foster the creation of an electromobility market of services (SGEMS);
- The national policy frameworks of the Benelux countries, which underline the need for regional cooperation in the Benelux context.

THE BENELUX GOVERNMENTS,

Set as an ambition:

- That publicly accessible charging infrastructure in the Benelux is easily accessible for all EV drivers within the Benelux, in a non-discriminatory way;
- That EV drivers are able to pay for charging sessions on ad hoc basis or by using their own e-mobility service contract;
- That charging tariffs are transparent and fair for all consumers.

And express their dedication to:

- Support the relevant players in their efforts to interconnect the public charging infrastructure in the Benelux countries and to make it easily accessible for all EV drivers within the Benelux, by providing these players with a platform for harmonization and cooperation;
- Encourage the publication of real-time information on location, specifications and status of EV charging points in openly available and re-useable datasets;
- Facilitate cross-border deployment of e-mobility services, in particular user-identification and payment solutions;
- Encourage the adoption and further development by the relevant players of common - and preferably open and standardized – communication protocols for the connection of e-mobility services and charging infrastructure;
- Follow the key principles of price transparency, cost effectiveness (avoiding unnecessary costs) and non-discriminatory accessibility, and to foster interoperability, open communication standards and open market models when stimulating the deployment of charging infrastructure and the e-mobility market of (charging) services;

- Work together at EU-level, for example by coordinated implementation of EU Directives on the deployment of charging infrastructure, and to support a European plan of action regarding the guarantee of cross-border access to charging infrastructure and the e-mobility market of services;

- Use the Benelux Union to identify joint actions to contribute to the above-mentioned objectives.

Nature of the Political Declaration

This document records a political intent alone. It is not intended to establish any legal commitments.

Signatories

For Belgium

For Luxembourg

For The Netherlands

Annex 13: Letter of Intent (LOI) regarding borderless access to e-mobility services in the Benelux region

Letter of Intent (LOI)

Regarding borderless access to e-mobility services in the Benelux region

With this Letter of Intent, Open Chargepoint (BE), eVolin (NL) and Chargy (LU) declare to work together towards borderless e-mobility access services between the Benelux region.

Cross-border cooperation ensures a huge growth of mutual interoperability. By enabling to charge everywhere with clear information about location, availability and price of charging stations, roaming costs are minimized and EV drivers can get maximum benefit and access to added services.

Open Chargepoint, eVolin and Chargy will contribute to the efforts to interconnect the public charging infrastructure in the Benelux region and to make it easily accessible for all EV drivers within the Benelux.

Close cooperation will be established in the following areas:

1. The issuing of ID's by a centralized organization in order to identify electric vehicle charging points and identify tokens;
2. A single set of minimum requirements regarding the use of charging stations (e.g. time, price transparency and usage);
3. A single set of minimum requirements and code of conduct regarding technological equipment's (e.g. RFID card reader and charging points specifications);
4. The set-up of easily accessible public charging infrastructure in the Benelux for all EV drivers within the Benelux, in a non-discriminatory way, using their own e-mobility service contract.

The successful cross-border cooperation between Belgium, the Netherlands and Luxembourg is further fostered and expanded by assuring e-mobility access services within a dense region. In June 2017, the Benelux-countries represented a quarter of plug-in-hybrid/battery electric vehicles and almost a third of EV charging positions in the EU-28.

The Hague, 7 December 2017	The Hague, 7 December 2017	The Hague, 7 December 2017
Stefan Meers, Open Chargepoint	Jurjen de Jong, eVolin	Alex Michels, Chargy

About Open Chargepoint Belgium
Open Chargepoint Belgium (OCP.BE) is the sectorial organisation which was founded by six Chargepoint Operators (CPO) in 2016.
OCP.BE members are committed to active contribution to open and user-friendly access to publicly accessible charging points for all electric vehicles in Belgium.

Active members:

- Allego
- Blue Corner
- EVBox
- Eneco
- EV-Point
- NEWMOTION
- MOBILITYPLUS

More information on: www.openchargepoint.be

About eViolin
eViolin is responsible for ensuring national roaming in The Netherlands. At this moment eViolin manages the roaming for over 140.000 EV cards/tokens, 40.000 charge stations and 23 charge point operators and mobility service providers. eViolin is also responsible for the issuing of IDs for these organizations, which makes eViolin crucial in the EV ecosystem to support exchange of data and roaming.

Active members:

- Alfen
- Allego
- ANWB
- Blue Corner
- Blue Current
- BMW
- EVnetNL
- Eneco
- EVBox
- Fastned
- FLOW Charging
- Green Flux
- LastMileSolutions
- Movenience
- MultiTankcard
- NewMotion
- Nuon
- Optimile
- Plugsurfing
- ServiceHouse
- Travelcard
- Vandebron
- VitaeMobility

More information on: www.eviolin.nl

About Chargy
Chargy, the first network of public charging stations in Luxemburg, is a joint venture between the five grid operators. Chargy will implement 800 stations, that means 1'600 charging points by 2020. At least one station will be installed in each municipality of Luxembourg, in order to guarantee a national network coverage. Thereupon Chargy will also integrate other private charging stations becoming Chargy Ok. Finally, the Chargy network will count more than 1'600 charging points in Luxemburg.

Partners:

- Sudstroum
- Electris
- Ville d'Ettelbruck
- Ville de Diekirch
- Creos Luxembourg

More information on: www.chargy.lu