ALPIQ

Electrical vehicle market penetration in Switzerland by 2020

It is not possible to forecast the future but we can prepare it

Index

Atel & EOS join their forces to create Alpiq, a new energy leader for Switzerland and Europe. We combine power generation, transmission, sales & trading and energy services into a comprehensive offering of energy solutions.

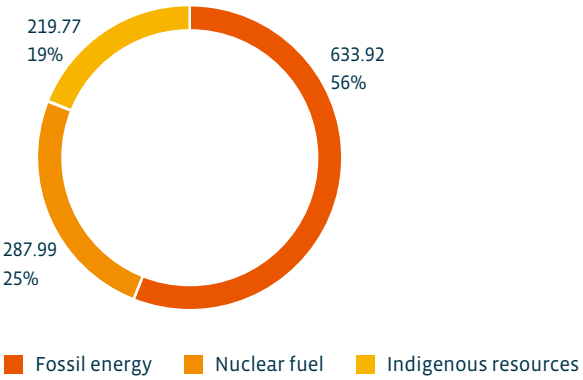
1. Alpiq. A new energy leader

As a leading national energy company, Alpiq is ready to play an important proactive role in providing economically feasible solutions for ensuring security of energy supply and achieving reduction in Greenhouse Gas (GHG) emissions.

- Present in 29 European countries
- Cumulated turnover of CHF 16 billion
- Workforce of more than 10,000
  (in Switzerland > 5,000)

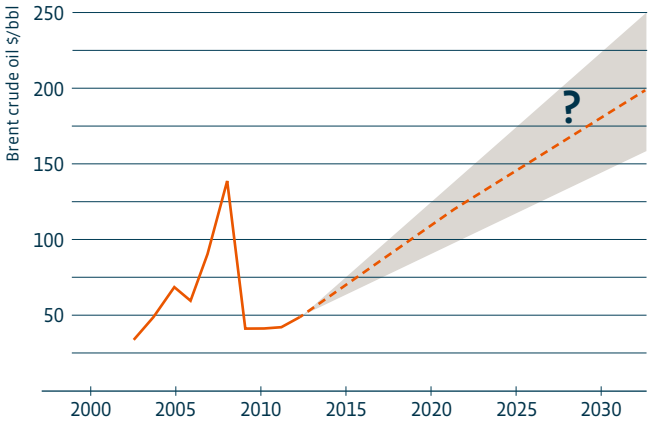
2. Swiss energy challenges and objectives

Figure 1: Primary energy balance sheet for Switzerland 2007



Source: Statistiques suisses de l'énergie 2007, OFEN

Figure 2: Crude oil price



2.1 High dependence on fossil energy

Switzerland is highly dependent on fossil energy imports. Foreign oil and gas account actually for 56% of its primary energy use. National energy resources are limited to 19%, of which hydroelectricity resources are predominant with 11.5%.

2.2 Latent risk on fossil energy imports

After the dramatical surge of crude oil price in summer 2008, the recession of the global economy has made the oil price plunge to the 40 $/bbl level. But no doubt about it, with the recovery of the economy, oil price will again increase rapidly. Actually, several experts[1] see its price reaching 200 $/bbl by 2030.

In the long term, the overtake of the oil-peak will determine an irreversible and inevitable cost increase of petrol based fuels. This price increase will last several decades, before the oil finally runs out at all.

[1] See by example IEA World Energy Outlook 2008

2.3 Swiss energy strategy

The energy challenges to be met by Switzerland are twofold:

- Mitigation of the threat of peak oil and following drastic price increase by reducing the dependency of Switzerland on oil & gas
- Meeting the climate challenge by reducing significantly nation GHG emissions

The Swiss Government has accordingly published his energy strategy beginning 2008, based on four pillars:

- Increase in energy efficiency and control of the energy demand increase
- Increase of the share of renewable energy
- Construction of large electric generation plants, that is replacement of aging nuclear plants and construction of combined cycle gas turbines (CCGT) as transitory solution
- Strengthening of international collaboration

The Swiss climate strategy will be discussed by the Parliament in 2009/2010. The two solutions proposed by the Swiss Government concern i) an alignment on the EU Climate policy with a 20% reduction of Greenhouse Gas (GHG) emissions by 2020 obtained primarily by domestic measures ii) a more ambitious reduction of 50% by 2020, in majority thanks to foreign mitigation measures.

Much will therefore depend on the outcome of the Climate and Energy package of the EU and of the issue of the COP[2] 2009 international discussions in Copenhagen on the post Kyoto Protocol. But the global climate issue is already well-known: preventing dangerous interferences with the climate requires CO_2 emissions to be reduced worldwide to around 23 billions tons in 2030[3], a reduction of the same order of magnitude as the world 2005 global emissions. This is a huge challenge and Switzerland will have to do its share.

[2] Annual Conference of Kyoto Protocol Parties
[3] Source: International Panel on Climate Change (IPCC)

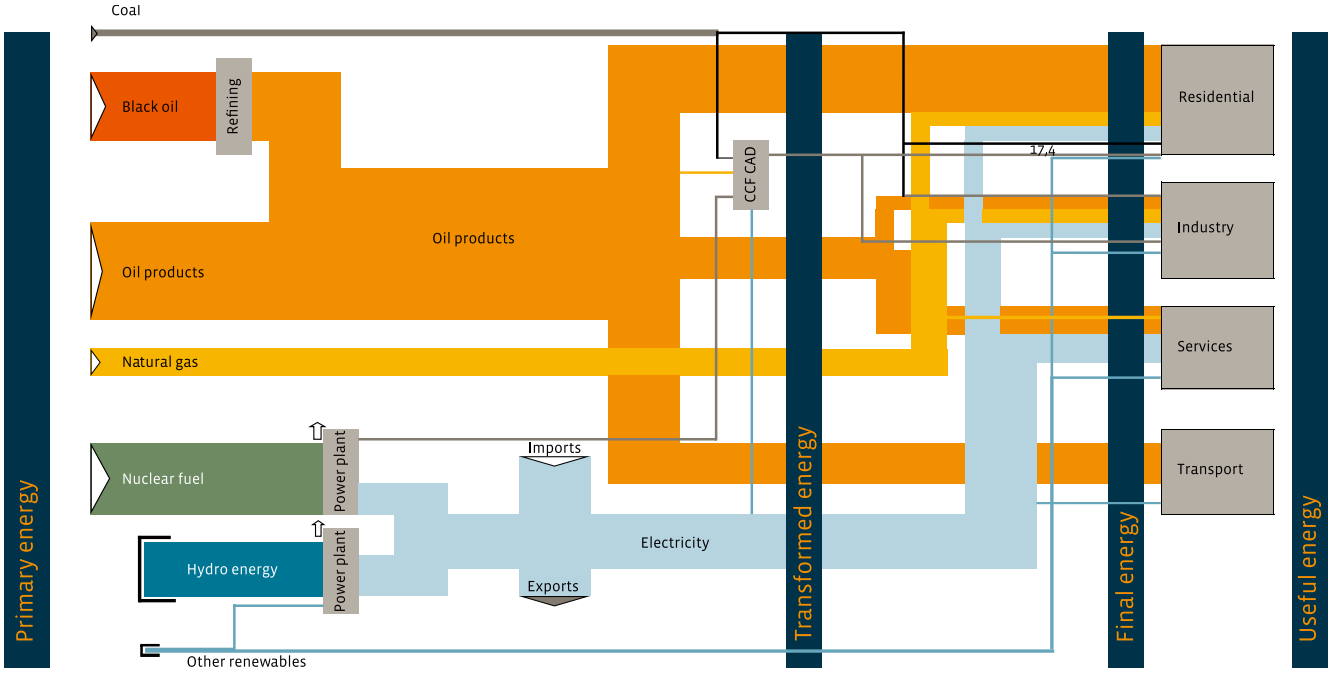
3. Alpiq energy strategy

3.1 A global approach is needed.
Since constraining the energy demand by putting an upper limit to energy usage is a measure socially undesirable and politically difficult to enforce, the focus must be set on increasing the energy efficiency.

The playground is here the Swiss "global energy engine" which, from primary energy resources[4], brings to every economic agent the useful energy[5] when, where, in the form and in the amount needed. The diminution of the Swiss dependence to fossil energy is a challenge of major importance.

Increasing energy efficiency means reducing the transformation losses from primary energy to useful energy.

Figure 3: Swiss global energy engine



[4] By example: oil, natural gas, coal, uranium, wind, solar irradiation, geothermal flux
[5] By example: dwelling and office heat & light, transportation mechanical movement

3.2 The role of electricity

Electricity can provide a new path to secure competitive energy in a fossil-constrained and carbon-constrained world, especially in Switzerland where the electricity generation is almost free of CO_2.

Electricity, which is not a primary energy but a transformed energy, can be produced from nearly all primary sources. Electricity can therefore integrate most of the renewable energy sources and gradually contribute to the greening of the global energy engine.

The intelligent electrification of the economy will provide a great potential of energy savings, through the increased efficiency of transformation of primary energy into useful energy.

Indeed, very substantial progress in terms of energy efficiency, CO_2 emission limitations and reduction of oil and gas dependency are possible by an intelligent electrification of the Swiss economy, in particular in two areas:

- Heating and cooling through the use of heat pumps in the residential sector
- Pluggable electric cars for the private road transport

The replacement of less efficient electro-technologies (incandescent lightning, direct electric heating, standby power, etc.) must also be accelerated by more efficient electro-technologies.

Alpiqs strategy is aimed to secure the electricity supply in Switzerland and to maintain national low-carbon electricity generation in a diversified mix using all available options:

- Increase renewable share (hydro and other sources)
- Replacement of aging nuclear generation plant
- Clean-fossil Combined Cycle Gas Turbine (CCGT) as transitory solution

3.3 Smart grid: potential improvement at hand

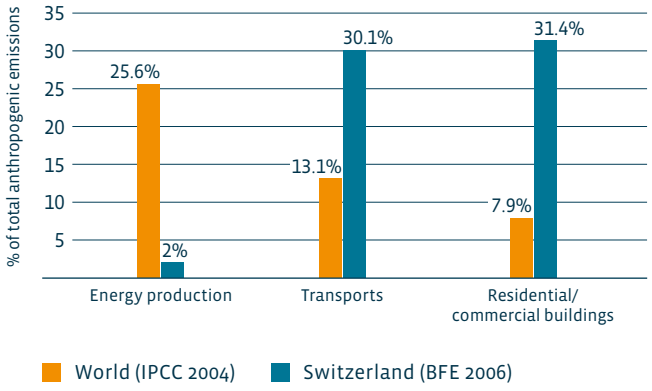
The Swiss power network is interconnected to the European grid in a system capable to deliver just-in-time energy where and when it is needed with an outstanding efficiency and reliability. This fantastic machine irrigates each household day and night.

The integration of clean renewable sources of energy like photovoltaic solar, wind and geothermy will need the power grid to evolve towards a more distributed delivery network, capable of a two-way flow of information and electricity.

This “smart grid” will incorporate the benefits of distributed intelligence, computing and communication and will facilitate the power balance between supply and demand at the device level. The “smart grid” will also contribute to increase the energy efficiency by reducing the final energy (commercial energy) needs and expenses of all economic agents.

4. Alpiq supports electrical vehicles

Figure 4: Sources of greenhouse gas (GHG) emissions



4.1 In Switzerland, electricity is part of the solution, not part of the problem.

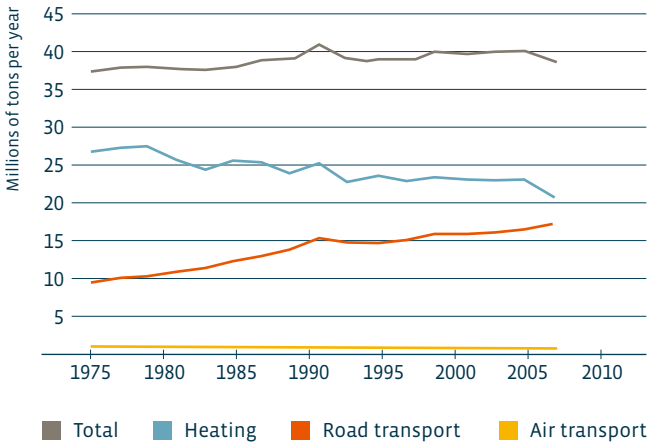
The Swiss sources of greenhouse gas (GHG) emissions differ much from the world situation (figure 4):

- The Swiss share of the energy sector is negligible with 2.7% when it is a major component (¼) for the entire world.
- The GHG emissions of the transport sector account for ⅓ in Switzerland when this percentage is slightly over 1/10 worldwide.

This shows clearly that the Swiss Climate policy must focus on sectors emitting large amounts of GHG like residential and transports sectors.

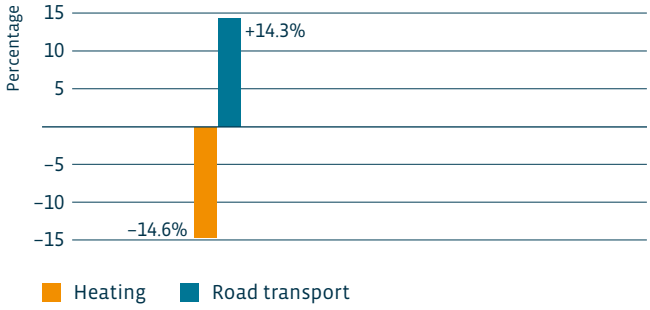
In Switzerland, contrary to the worldwide situation, energy for electricity generation is not a CO_2 issue.

Figure 5: Swiss CO_2 emissions



Source: Ecoplan, „CO_2-Emissionen 2008–2012“, Schlussbericht, BFE September 2008

Figure 6: Variation 1990–2007



Source: Ecoplan, „CO_2-Emissionen 2008–2012“, Schlussbericht, BFE September 2008

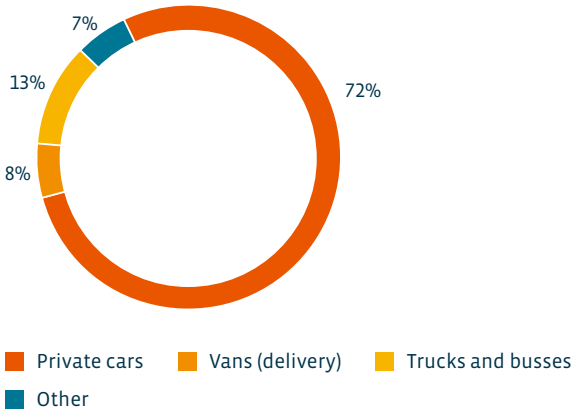
4.2 Increasing CO_2 emissions of the road transportation is a problem

In EU, emissions of CO_2, the most important GHG, have been growing fast in the road transportation, where at the contrary the emission trend is steady or decreasing in the other sectors (figure 5).

The situation is similar in Switzerland. Since CO_2 emissions of the transportation keep on growing (+14.3%, 1990–2007), the total Swiss emissions of CO_2 have remained steady at around 39 millions tCO_2/year despite a significant reduction in the industrial and residential sectors during the last decade (–14.6%, 1990–2007, figure 6).

Clearly, the focus of the Swiss Climate strategy should be set on the CO_2 emissions of the road transportation sector (44% of total Swiss emissions 2007), and in particular in the private car transport, the greatest source (72%) of the CO_2 emission within it (figure 7).

Figure 7: Road transport CO_2 emissions (2007)



Source: Metron Ecoplan „Handelbare Vebrauchsgutschriften für Neuwagen“, Greenpeace CH, Januar 2009

4.3 Necessity to consider global energy chains

In order to evaluate and compare the environmental impact of a vehicle concept, energy consumption and emission intensity must be considered from the source of the primary energy carrier (well) to the end user (wheel of the vehicle).

The Well-to-Wheel evaluation (WtW) is the sum of the Well-to-Tank (energy expended and the associated greenhouse gas (GHG) emitted in the steps required to deliver the finished fuel into the onboard tank of the vehicle) and the Tank-to-Wheel (energy expended and the associated GHG emitted by the vehicle/fuel combination) values (figure 8).

When considering the whole energy chain (Well-to-Wheel), the overall energy efficiency depends on the electricity generation mode, i. e. the type of generation plant and source of primary energy used for electricity generation.

To simplify the comparison, assume that electricity is produced in a modern power plant (CCGT) with oil as primary energy. In this particular example, a standard internal combustion engine (ICE) and a battery electric engine (BEV) will run on the same primary energy, that is oil. The comparison of the two energy chains shows the overall electric energy chain (Well-to-Wheel) is around twice more efficient than the traditional gasoline chain with combustion engine. This results from the fact that an electric power train is about four times more efficient than a combustion engine (Tank-to-Wheel, figures 9a–b).

Figure 8: Global energy chain Well-to-Wheel

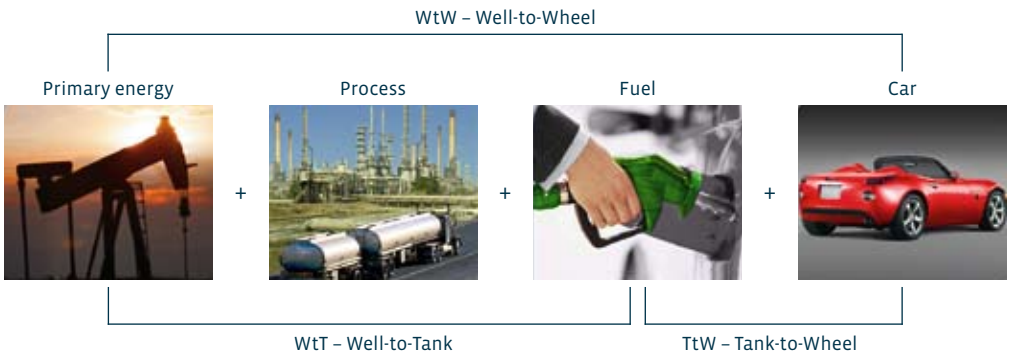
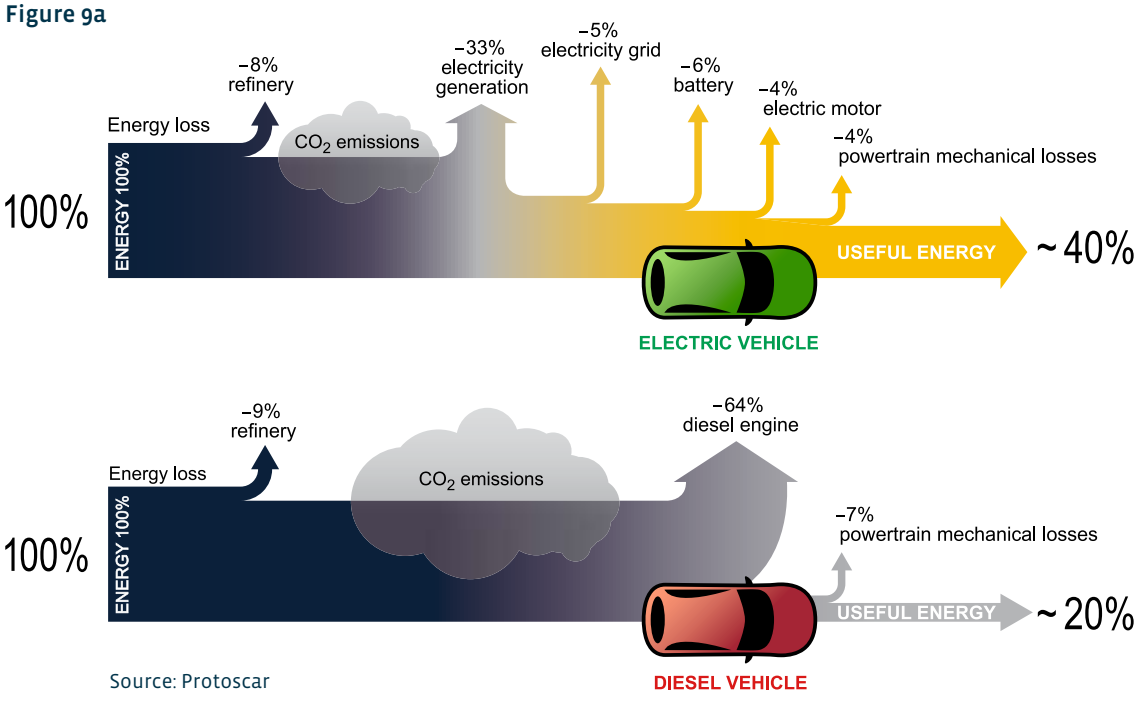
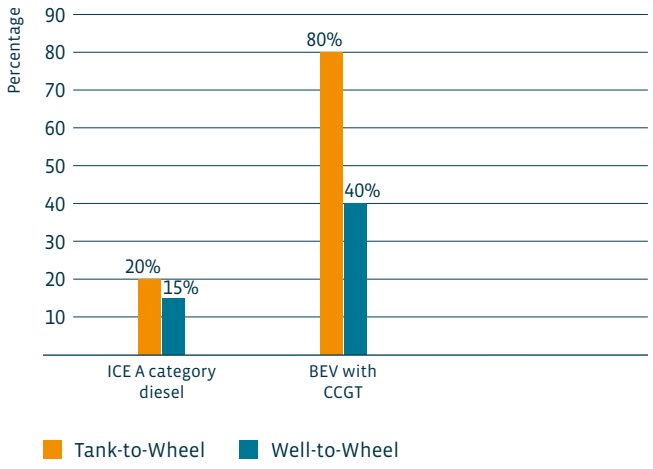


Figure 9a



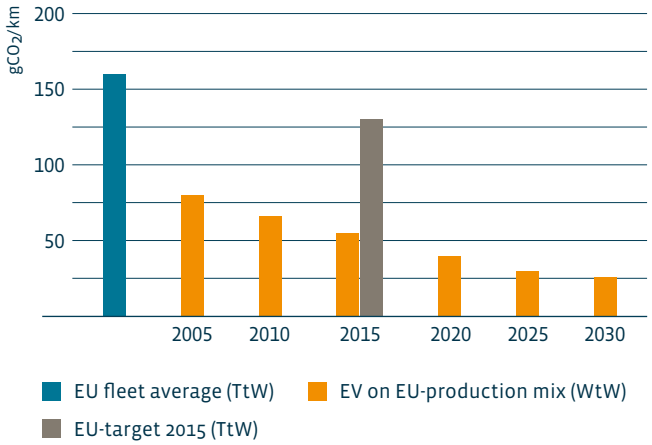
Source: Protoscar

Figure 9b: Efficiency comparison



Source: Protoscar

Figure 10: CO_2 emissions for private cars in the EU context



Source: Eurelectric

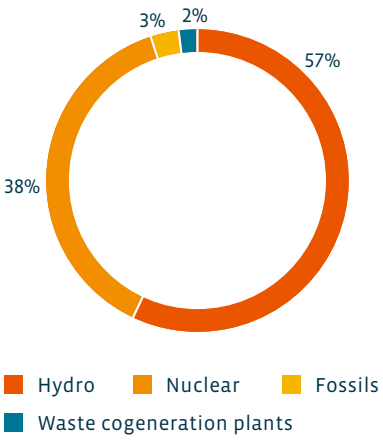
4.4 Carbon intensity of European electricity

The generation fleet of European countries is not only comprised of up-to-date modern power plants with high efficiency. Several plants belong to an older generation with lower efficiency. Primary energies (coal, gas, hydro, nuclear) used are also different. Share of renewable (hydro, wind, solar, etc.) in the generation mix varies much across the continent. Therefore, the specific CO_2 emission of electricity (gCO_2/kWh) differs much between European countries.

In 2005, the average EU mix had a specific CO_2 emission of 410 g/kWh. Replacing conventional internal combustion engine with electric vehicles (EVs) would result in major reductions in CO_2 emissions. With the current carbon intensity of the European electricity production mix, a typical electric car results in CO_2 emissions of around 80 g/km. This compares favorably to the current EU market average of CO_2 emissions from passenger cars – about 160 g/km.

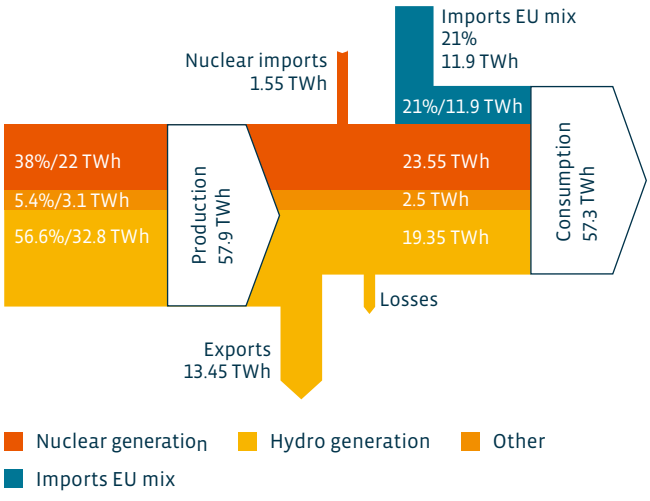
However, the European electricity sector will reduce in carbon intensity over the coming years, particularly with increased use of renewables and carbon capture and storage. EURELECTRIC estimates that the carbon intensity of EU electricity in 2030 will diminish to 130 g/kWh, which results in emissions from electric cars of less than 30 g of CO_2 per km (0.18 kWh/km EV consumption, figure 10).

Figure 11: Swiss electricity production mix 2005



Source: Statistique Suisse de l'énergie 2005, OFEN

Figure 12: Swiss generation and consumption mix (2005)



Source: OFEN, Strommix-Kennzeichnung, December 2007

4.5 Swiss electricity Carbon intensity

In Switzerland, the generation mix is practically free of CO_2. Only 5% of the electricity generation comes from fossil or waste cogeneration plants. Actually 57% of the Swiss electricity is produced from hydro, while the remaining 38% comes from nuclear plants (figure 11).

The Swiss generation mix will remain CO_2 free since additional capacity will be renewable (hydro, wind solar, all CO_2 free), combined cycle gas turbine power stations (with an obligation of 100% CO_2 emissions compensation), or nuclear (free of CO_2). Compared to the EU mix, the Swiss electricity generation is much cleaner.

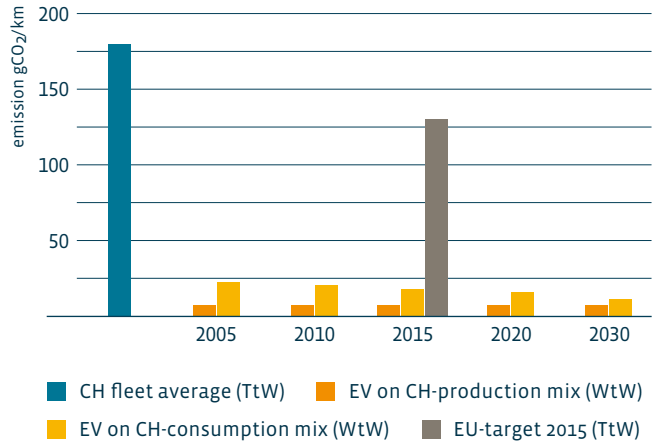
Taking into account imports and exports, the Swiss electricity consumption mix is slightly different, since 21% comes from EU imports (figure 12).

Since the EU generation mix is not CO_2 free, the Swiss consumption mix has a higher CO_2 content than the Swiss generation mix. But the Swiss electricity consumption mix will also beneficiate from the future decarbonatation of the EU mix as follows.

	2005	2010	2020	2030
Electricity	gCO_2/kWh	gCO_2/kWh	gCO_2/kWh	gCO_2/kWh
EU production mix	407	351.6	240.8	130
Swiss production mix[1]	34.4	34.4	34.4	34.4
Swiss consumption mix	112	100.6	77.6	54.7

[1] Included fossil and waste cogeneration

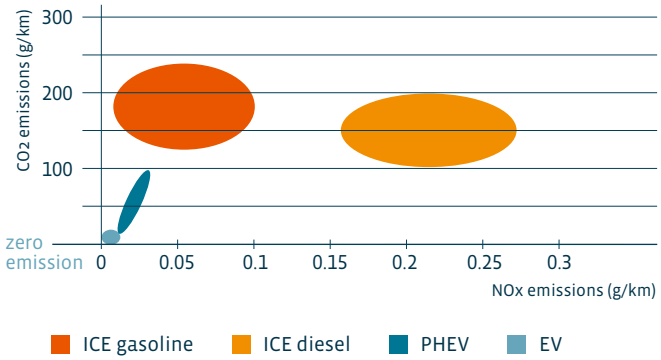
Figure 13: CO_2 emissions of private cars in Swiss context



With the current carbon intensity of the Swiss electricity, a typical electric car emits less than 7 gCO_2/km (generation mix), respectively 23 gCO_2/km (consumption mix). A typical electric car results in global CO_2 emissions savings (Well-to-Wheel) of around 160 g/km (compared to today CH fleet average). In 2015, the CO_2 reduction is still more than 100 g/km compared to EU-target 2015 (figure 13).

Even compared to the futures standards technologies required by the Eu Target 2015, Swiss EVs have a tremendous comparative advantage on internal combustion engines thanks to the quality of Swiss electricity.

Figure 14: Local air pollutant emissions (TtW) middle european class private car



4.6 No pollution in cities

Electricity as an alternative fuel for the mobility sector results also in drastic reduction of local air pollutant (CO_2, NOx, small particulates), emitted in cities (figure 14).

4.7 A diversified supply

Electricity also ensures a diversified supply of primary energy for the road transportation, since :

- Electricity is not a primary energy
- Can be generated from different primary energy sources (renewable, oil and gas, coal, nuclear)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5. Vision 2020 of future clean mobility

A massive uptake of EVs in the Swiss fleet of private cars would significantly help to reach the ambitious goals of Swiss climate and energy policy. A confidential penetration of EVs has only a marginal interest for the Swiss climate and energy strategy.

Massive penetration of EVs will however not be sufficient by itself to meet the goals of Swiss climate & energy policy. Several other measures are necessary, among them improvement of public transportation in cities, improvement of territory organization, facilitation of transportation modal change (car parking lots near public transportation stations), etc.

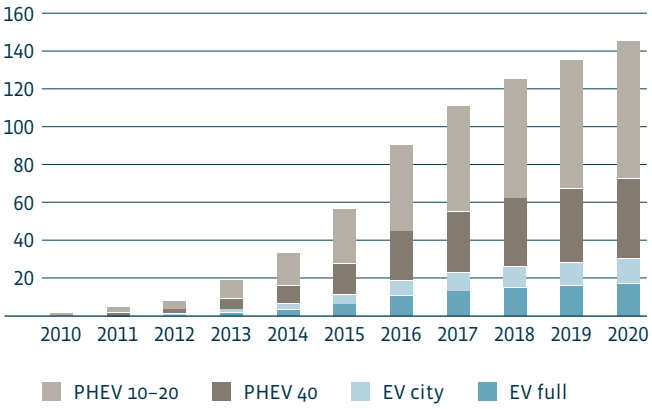
Bio fuels, hydrogen are alternatives to fossil fuels like gasoline, diesel or compressed natural gas (CNG), but will not show up automatically. Biofuels can substitute traditional fuels only in a limited quantity because only limited secondary vegetal material can be taken into account (in order to avoid competition for food production), hydrogen has still to overcome at least the main hurdle, which is the installation of a brand new distribution network. On the contrary, a sufficient electric network infrastructure exists already in all developed countries.

For private cars, an increasing total electrification seems therefore unavoidable simply because this represents the best solution from a global energy efficiency point of view and simply because no viable alternatives exist. On the long term (2050?) nearly all new cars will therefore be powered by electricity. Even hydrogen for fuel-cell cars may primarily be produced by electricity, since the hydrogen production via electrolyzing is both more efficient and more environmental friendly than natural gas reforming.

The penetration of EVs in the Swiss fleet of private car shall meet the following boundary conditions:

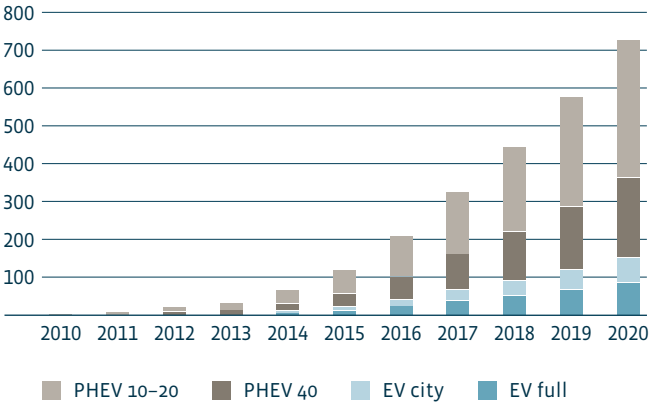
- The frame of business is a free market in which competition is the main driver.
- Within this situation all services and goods are fully paid by the beneficiary.
- Internalization of external costs could become a governmental policy but shall remain neutral from a fiscal point of view.
- Clean electrical cars must be able to offer sufficient mobility performances to meet the market requirements. This also means that the total cost of ownership (TCO) will have to be competitive.
- Original Equipment Manufacturers (OEM's) supply sufficient pluggable cars – that is battery electrical vehicle (BEVs) and plug-in hybrids (PHEVs) – to the Swiss market.

Figure 15a: New cars according to VISION 2020
(in thousands)



Source: Protoscar

Figure 15b: Cumulative cars according to VISION 2020
(in thousands)



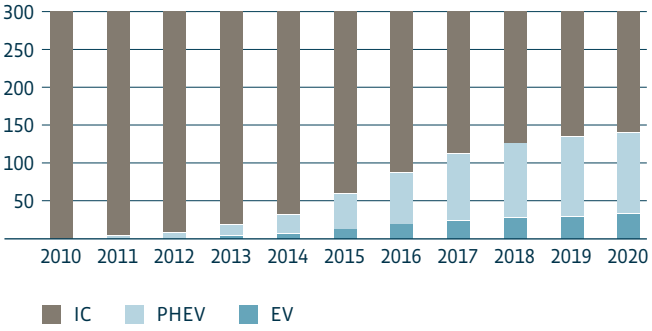
Source: Protoscar

5.1 Our vision

By 2020 the Swiss car fleet comprises 720,000 electric pluggable cars (PHEVs and BEVs), that is roughly 15% of the total. To materialize this goal of 15% EVs penetration in the 2020 Swiss car fleet, important EV related promoting measures are necessary on both the supply and demand sides.

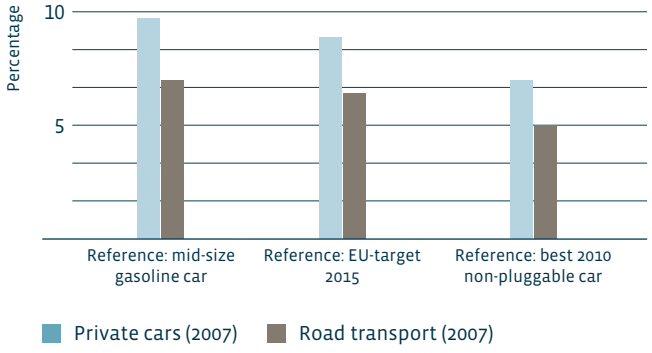
The average market penetration in the period 2011–2020 shall therefore be around 70,000 clean EVs cars yearly. The roadmap for this penetration is incremental starting with 2% in 2011 and ending up with 50% in 2020. Assuming 300,000 matriculations per year, the yearly share of new EVs has to grow to nearly 100,000 new Clean EV cars entering the fleet by 2020 (figures 15a–b).

Figure 16: New EV/PHEV 2010–2020 (in thousands)



Source: Protoscar

Figure 17: Reduction of CO_2 emissions



According to research by Protoscar, the supply of all EVs types by OEMs to the Swiss market would be sufficient, provided OEMs consider the Swiss market of strategic interest.

After validation of the feasibility of the VISION 2020 based on the sales estimations both from a "demand" and from an "offer" point of view, Protoscar's study results in the figure seen to the left (figure 16).

5.2 Climate and Energy Impact of Vision 2020 realization

The realization of the 15% EVs vision under Protoscar scenario would result by 2020 in:

- a significant reduction[6] of 1.2 millions tCO_2/year if compared to a reference mid-size gasoline car, of 1.1 if compared to the target 2015 (130 g/km TTW) and 0.86 if compared to the best "not pluggable" technology (reference mid-size DICI DPF[7] hybrid, figure 17).
- a reduction of 1.2 millions tCO_2/year corresponds to a reduction of 9.7% of the 2007 CO_2 emissions of the Swiss fleet of private cars.
- an important saving on fossil fuel amounting to 550 millions liters of gasoline (compared to a mid-size gasoline car) and 420 compared to the best "not pluggable" technology (reference mid-size DICI DPF hybrid).
- important corresponding savings on gasoline expenditures.
- a small increase of 1.2 TWh of electricity consumption, that is only 1.8% of the Swiss 2007 production of 65.9 TWh[6]. The increase would increase to 1.7 TWh (2.6%) if every PHEV (conservative assumption) would drive 100% electric.
- a required power of 1.3 GW during the off-peak hours with the very conservative assumption that up to 50% of the fleet recharge simultaneously and that there is no attenuation with the "smart grid" new functionalities.

[6] Assumptions: EV consumption TTW=18 kWh/100km, 12,800 km/year average European mileage, PHEV40 drive 80% electric while PHEV10–20 only 50%, Swiss production mix.
[7] Direct injection compression ignition diesel particle filter (DICI DPF).

6. Meeting the 2020 vision

6.1 Establish Switzerland as a show case for EVs in EU
Switzerland could play a pioneering role in the development of electric individual mobility.

The Swiss car-fleet is one of the most dense worldwide, uses more fuel per vehicle and emits more CO_2 that the EU average. (CH fleet average 180 gCO_2/km compared to EU fleet average 160 gCO_2/km).

The income, the living standard and the willingness to pay for car expenditures are high. At the same time, the ecological sensibility is widespread in the public and plays a major role in the national politic agenda.

Swiss electricity is practically free of CO_2 (and will remain so), the leverage on climate improvement is therefore maximal. Since Switzerland has no fossil energy resources (no coal, no oil, no natural gas), there is no national "preference" of a given fossil primary energy which could induce a political bias.

Switzerland represents one of the best initial test markets for EVs/PHEVs due to:
- Its "car neutrality" (no national manufacture, three distinct cultural areas)
- Its indirect participation to the EU and its car related rules
- Its particular geographic situation central Europe
- And to the relatively high income level

6.2 Why a strong strategy is needed
Despite Switzerland has all the intrinsic characteristics a pilot country should have, the analysis of the unsuccessful first generation EVs and the result of the pilot projects show that to meet the 2020 vision it is necessary to implement a strong strategy.

To rely only on the market laws or to implement a simple strategy based on a creation of economical and mobility advantages for EVs/PHEVs together with the implementation of the recharging infrastructure is not enough, because:
- There are a lot of emotional aspects, or psychological barriers, like fears, skepticism, feeling to lost the freedom (due to the limited range and the long recharging times) etc. to overcome.
- The lack of a public charging infrastructure increases all these fears.
- EVs/PHEVs are perceived and will continue to be, at least in the next years, as revolutionary objects in the very conservative car world (both on demand and supply sides), thus the conditions to allow their acceptance must be prepared.
- The commercialization experience of clean cars remains poor: the dealers must act also more as consultants than dealers to push the clean car.
- The EVs/PHEVs on the market should be required by the people; with the economical advantages they could become affordable but the people must wish them.
- There are complicated and diversified cantonal road tax systems.
- In the past years OEMs have created a lot of skepticism around their will to manufacture clean cars.

These topics show that the strategy necessarily must be based on a multi-dimensional approach which involves not only the vehicle itself but also everything is around it.

6.3 The multidimensional approach

The multi-dimensional approach of the strategy means that its goals go in three main directions:

- to create an EV culture, i.e. to set up all the emotional and rational knowledge and experiences allowing to break down the psychological barriers and to let EVs/PHEVs be accepted despite their "revolutionary" perception: this is much more than to create a simple interest;
- to create favorable boundary conditions; a vehicle must interface itself with the general mobility, with the external infrastructures, with the political guidelines (taxation) and so on: these external conditions must be planned and implemented to give benefits to the EVs;
- to have good and emotional vehicles the people wish and can afford, i.e. to set up economical advantages for EVs/PHEVs.

These goals are strongly interconnected, since they mutually influence each other and moreover they require much diversified measures and stakeholders for the implementation.

6.4 Implementation of the strategy

The implementation of the strategy means to define the measures allowing reaching the goals.
To create an EV culture the measures must focus on:

- education
- PR/communication
- research
- creation of a networking

The EV culture is not only oriented on the possible customers, but it must be oriented on the overall society.
It is very important to target specific activities on the car dealers, as without their support the EVs/PHEVs cannot be successful at all.

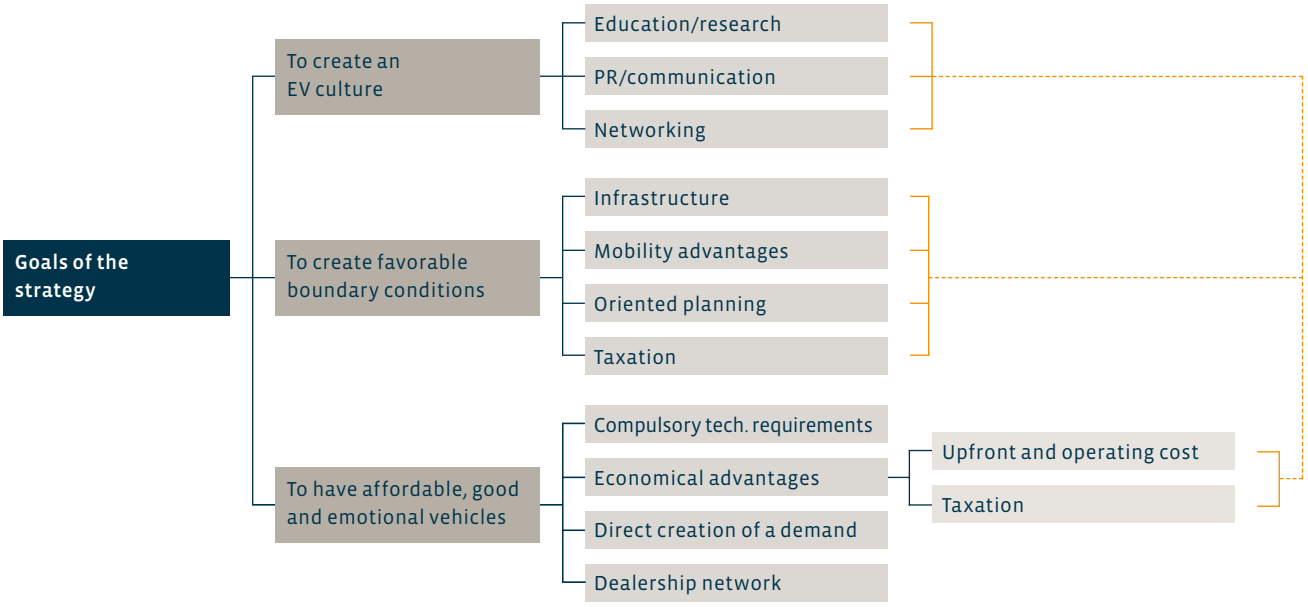
Pushing the research (academic and private) in the EVs/PHEVs direction has also other effects besides the creation of the "culture": the creation of the basis for possible future businesses and to give solutions to have better and more attractive EVs. The networking is the cooperation with all the organizations involved or potentially interested in EVs/PHEVs to create a strong EVs/PHEVs community to have more influence on the general strategic choices of the society.

To create favorable boundary conditions, the measures must focus on:

- The implementation of a recharging infrastructure
- The implementation of general mobility politics giving advantages to the EVs/PHEVs
- A general planning of the cities and mobility considering the requirements of the EVs/PHEVs in terms of space and infrastructure
- The implementation of taxation system based on the emissions and energy consumption

To have good and emotional vehicles the people wish and can afford, the measures must focus on:

- The creation of economical advantages which influence the upfront cost and the taxation
- The creation of economical advantages influencing the operational costs
- The definition of the technical requirements to have good vehicles
- The creation of a specialized multi-brand dealership network and the support to the OEMS which does not have a network in Switzerland
- The creation of a direct demand forcing the public fleet to adopt a certain number of EVs/PHEVs



These measures point in several directions which can be summarized in:

- Legislation and policy oriented
- Technical oriented
- Economical/financial oriented
- PR/communication oriented
- Educational/research oriented

Considering the wide range of the measures, several stakeholders are called to implement them:

- Private partners involved in technical measures
- OEMs involved in technical, economical/financial, PR/communication and educational/research measures
- Electricity concerns; involved in technical, economical/financial, PR/communication and educational/research measures
- Politics and public bodies issuing rules and regulations (at the three levels of Confederation, cantons, municipalities/cities) involved in legislative measures
- Academic/training world involved in education/research measures

	Legislation and policy	Technical	Business Dev.	PR and communication	Education research
Private companies		X	X	X	
OEMs		X	X	X	X
Electric utilities		X	X	X	X
Politic & Gov. bodies	X				X
Universities		X			X

7. Next steps

7.1 Establish Switzerland as a show case for EVs in EU and communicate the 2020 vision

Communicating and sharing the 2020 vision is of the utmost importance in order to:

- Unify existing EVs promoters
- Rally new supporters

Alpiq will introduce for that purpose a webpage dedicated to the Green electric cars and the 2020 vision on his web site www.electricitepourdemain.ch and www.immergenugstrom.ch in order to get suggestions, comments and integration proposals.

7.2 Pre-competitive 2020 Coalition of interest

There is an extremely high requirement for standardization of recharging infrastructures and interface equipments. New standards must anyway be defined internationally to accommodate the Japanese, American and European markets boundary conditions. These standards must be open and non-proprietary to allow a fast uptake of EVs, internationally and also in Switzerland. This normalization must be done internationally, since OEMs are global players. Switzerland must by all means avoid creating its own indigenous rules.

Building a Swiss pre-competitive coalition of interest with all involved stakeholders is therefore essential, in this multi-dimensional and multi-actors national framework that has to be inserted in a global picture.

Alpiq is active in this field and has agreed already on non-exclusive partnerships with several OEMs to create the bases of an open pre-competitive coalition of interest.

This broad coalition of interest is pre-competitive and non-exclusive in a first step. Alpiq recognizes however that, in a second step, industrial competitive partnerships for promotion of EVs will emerge based on proprietary business models. If these competitive partnerships are based on homogeneous standards, each will benefit from the business implementation of others, with an efficient synergy.

7.3 To join the 2020 Coalition of interest

Alpiq calls to join the 2020 Coalition of interest every stakeholder believing that:

- The individual mobility shall remain a basic freedom but its impact in term of emission, Well-to-Wheel efficiency and fossil energy dependency must be reduced.
- The electrification of the car power trains is an irreversible trend.
- Any discussion about the energy efficiency and emission of the vehicle must be done on Well-to-Wheel basis instead that on Tank-to-Wheel basis.
- It is better to lead the trend instead to be a follower.
- Switzerland, being a neutral, multicultural, wealthy nation, is the right place to begin EV/PHEV promotion.
- Switzerland shall be the leader nation to encourage, promote and favor this trend by playing a pioneering role in the development of electric individual mobility.
- This long term project must start now to be effective in 2020.
- The realization of the vision requires a multi-dimensional approach. All aspects have the same importance and must be pursued with the same amount of efforts.
- The multi-dimensional approach requires the collaboration of variety of stakeholders. Building a Swiss pre-competitive coalition of interest with all involved stakeholders is therefore essential.

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