

Electric vehicle market penetration in Switzerland by 2020

We cannot forecast the future but we can prepare for it



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Atel & EOS join 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 reducing greenhouse gas (GHG) emissions.

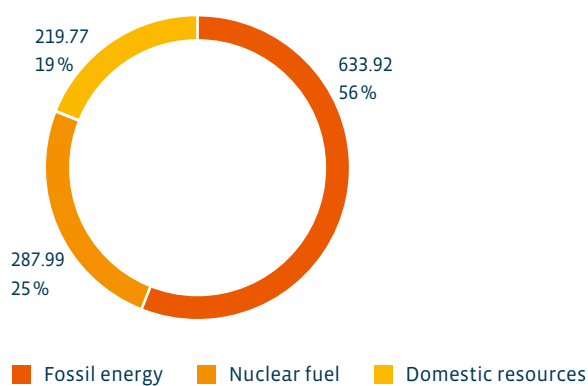
- Present in 30 European countries
- Cumulated turnover of CHF 15.8 billion in 2008
- Workforce of more than 10,000 employees (in Switzerland > 5,000)



- Power generation
- Energy services
- Sales & trading

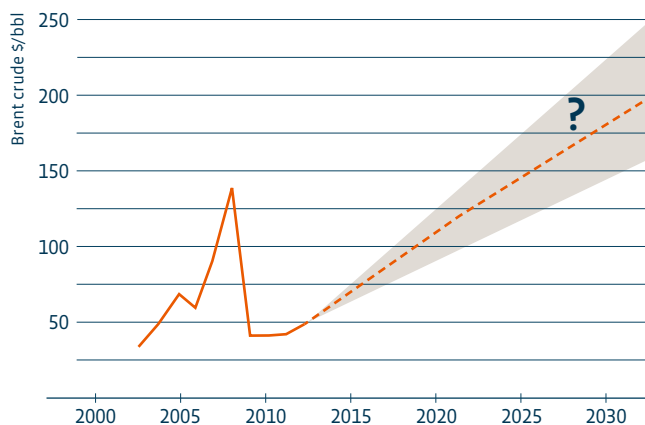
2. Switzerland's energy challenges and objectives

Chart 1: Primary energy balance sheet



Source: Swiss energy statistics 2007, SFOE

Chart 2: Crude oil prices



2.1 High dependence on fossil energy

Switzerland is highly dependent on fossil energy imports. Foreign oil and gas currently account for 56% of the country's primary energy consumption. Domestic energy resources are limited to 19% of national use, of which hydroelectricity resources are predominant with 11.5%.

2.2 Latent risk with fossil energy imports

After the dramatic surge of crude oil prices in the summer of 2008, the global recession caused oil prices to plunge to \$40/bbl. But prices will doubtlessly increase rapidly again once the economy recovers. Some experts¹ forecast a price of \$200/bbl by 2030.

In the long term, once peak oil is passed there will ensue an inevitable and irreversible cost increase of petrol-based fuels. This rise will last several decades before oil finally runs out completely.

¹ See IEA World Energy Outlook 2008

2.3 Switzerland's energy strategy

The energy challenges to be met by Switzerland are twofold:

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

The Swiss government accordingly published its energy strategy at the beginning of 2007, based on four pillars:

- Increased energy efficiency and control of growth in energy demand
- Increased share of renewable energy
- Construction of large electricity generation plants to replace aging nuclear plants and construction of combined cycle gas turbine (CCGT) plants as a transitory solution
- Strengthening of international collaboration

The Swiss climate strategy will be addressed by Parliament in 2009/2010. The two alternative solutions proposed by the Swiss government consist of 1) an alignment with EU climate policy for a 20% reduction in greenhouse gas (GHG) emissions by 2020, obtained primarily by domestic measures, and 2) a more ambitious reduction of 50% by 2020, mainly through concerted measures at the international level.

Much will therefore depend on the outcomes of the EU Climate and Energy package and the 2009 COP² post-Kyoto Protocol international discussions in Copenhagen. However, the global climate issue is already well known: the prevention of dangerous climate interference requires a reduction in worldwide CO₂ emissions to around 23 billions tons by 2030³, equivalent to the level of 2005 emissions. This is an enormous challenge for which Switzerland will have to do its share.

² Annual Conference of the Parties to the Kyoto Protocol

³ Source: International Panel on Climate Change (IPCC)

3. Alpiq's energy strategy

3.1 Need for a global approach

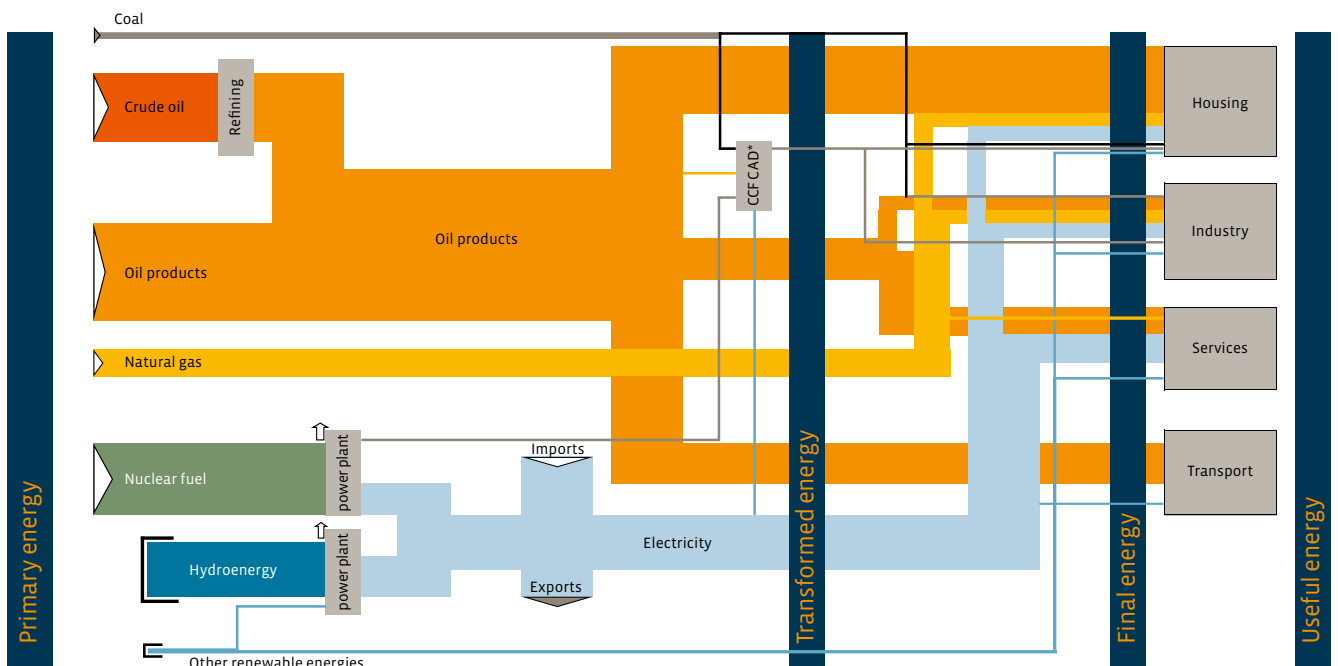
Since constraining energy demand by limiting consumption is socially undesirable and politically difficult to implement, effort must be focused on improving energy efficiency.

This approach is based on Switzerland's "global energy engine" where, from primary energy resources⁴, every

economic agent is supplied with the energy⁵ required, when, where, in the form and in the amount needed. Reducing Switzerland's dependence on fossil energy is a challenge of major importance.

Increasing energy efficiency correlates to the lowering of transformation losses from primary energy to useful energy.

Chart 3: Switzerland's global energy system



* CHP-Long-Distance Heating

⁴ For example: oil, natural gas, coal, uranium (nuclear), wind, solar, geothermal, hydro

⁵ For example: dwelling and office heat & light, transportation

3.2 The role of electricity

Electricity can provide a new solution for securing competitive energy in a fossil fuel and carbon-constrained world, especially in Switzerland where electricity generation is almost free of CO₂.

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

Electrifying the economy in an intelligent manner holds great potential for energy savings through superior efficiency in the transformation of primary energy into useful energy.

Indeed, very substantial progress in terms of energy efficiency, CO₂ emissions and reducing oil and gas dependency can be achieved through the intelligent electrification of the Swiss economy, particularly in two areas:

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

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

Alpiq's strategy is aimed at securing Switzerland's electricity supply and maintaining domestic low-carbon electricity generation in a diversified mix, using all available options:

- Increasing the share of renewables (hydro and other sources)
- Replacing aging nuclear power plants
- Using clean fossil fuel Combined Cycle Gas Turbine (CCGT) plants as a transitory solution.

3.3 Smart grid: potential improvement at hand

The Swiss power network is interconnected to the European grid in a system that, with outstanding efficiency and reliability, is capable of delivering just-in-time energy whenever and wherever it is needed. This fantastic mechanism supplies each household with power 24 hours a day.

The integration of clean, renewable sources of energy like solar, wind and geothermal will require the power grid to develop a more advanced delivery network, with the ability to support a two-way flow of information and electricity.

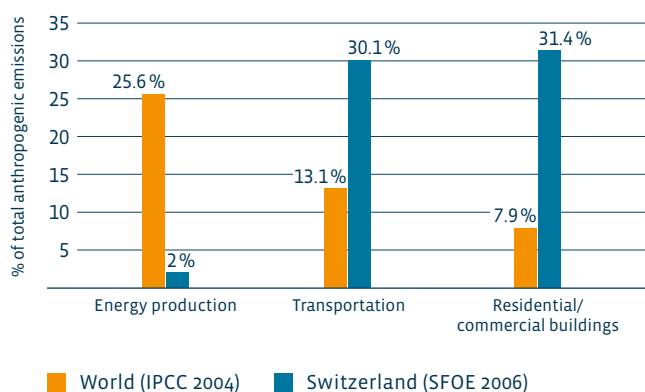
This "smart grid" will incorporate the benefits of distributed intelligence, computing and communication and will facilitate the power balance between supply and demand at the device level. The "smart grid" will also help increase energy efficiency by reducing final energy (commercial energy) needs and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





4. Alpiq supports electric vehicles

Chart 4: Sources of greenhouse gas (GHG) emissions



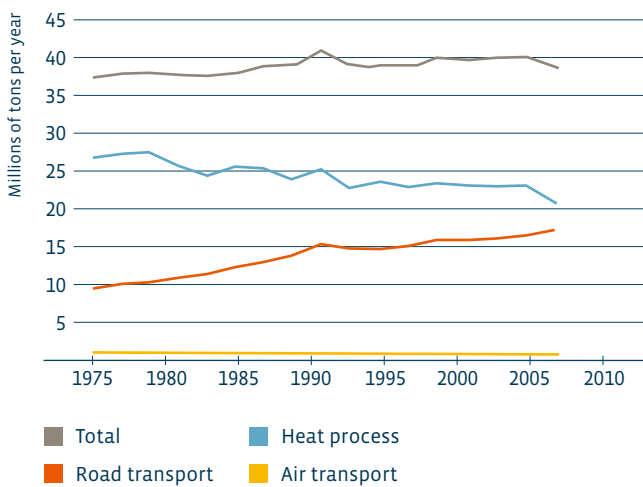
4.1 In Switzerland, electricity is part of the solution, not part of the problem

- Sources of greenhouse gas (GHG) emissions in Switzerland differ considerably from the world situation (chart 4):
- The energy sector is negligible in Switzerland with 2.7 % of GHG emissions, while it is a major component ($\frac{1}{4}$) over the entire world.
- The transport sector accounts for $\frac{1}{3}$ of GHG emissions in Switzerland compared to slightly over $\frac{1}{10}$ worldwide.

This clearly illustrates that the Swiss climate policy should focus on those sectors emitting large amounts of GHG, such as housing and transportation.

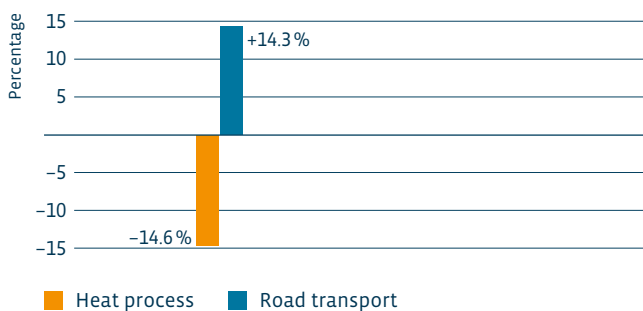
Contrary to the global situation, electricity generation is not a CO₂ issue in Switzerland.

Chart 5: Swiss CO₂ emissions (Energy use)



Source: Ecoplan, “CO₂-Emissionen 2008 – 2012”, Annual report, SFOE September 2008

Chart 6: Variation 1990 – 2007



Source: Ecoplan, “CO₂-Emissionen 2008 – 2012”, Annual report, SFOE September 2008

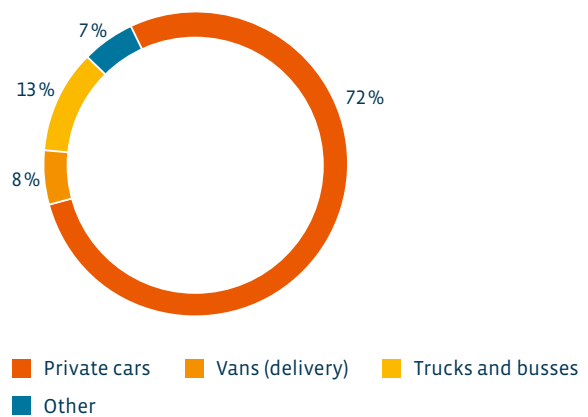
4.2 The problem of increasing road transport CO₂ emissions

In the EU, emissions of CO₂, the most important GHG, have been growing quickly in road transportation, whereas the emissions trend remains steady or is even decreasing in the other sectors.

The situation is similar in Switzerland (chart 5). Since CO₂ emissions in transportation continue to grow (+14.3%, 1990 – 2007), total Swiss emissions of CO₂ from energy use have remained steady at around 39 million tCO₂/year despite a significant reduction in the industrial and residential sectors during the last decade (– 14.6%, 1990 – 2007, chart 6).

Clearly, the focus of the Swiss climate strategy should be set on CO₂ emissions in the road transportation sector (44 % of total Swiss emissions in 2007) and on private cars in particular, the greatest source (72 %) of CO₂ emissions in the sector (chart 7).

Chart 7: Road transport CO₂ emissions (2007)



Source: Metron Ecoplan “Handelbare Verbrauchsgüterschriften für Neuwagen”, Greenpeace CH, January 2009

4.3 The importance of considering the global energy chain

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 (WtW) evaluation 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 (chart 8).

When considering the entire 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 the primary energy. In this particular example, a standard internal combustion engine (ICE) and a battery electric vehicle (BEV) engine will operate from the same primary energy, that is oil. A comparison of the two energy chains shows that the WtW overall electric energy chain is around twice as efficient as the traditional gasoline chain using a combustion engine. This results from the fact that an electric power train is about four times more efficient than a 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, charts 9a – b).

Chart 8: Global energy chain Well-to-Wheel

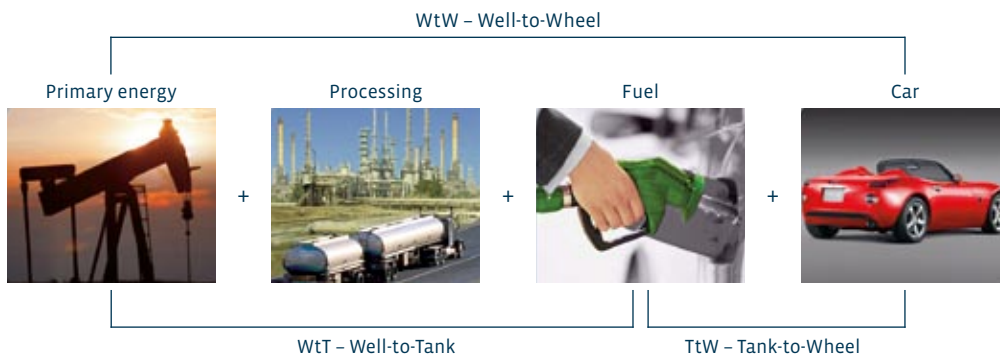


Chart 9 a

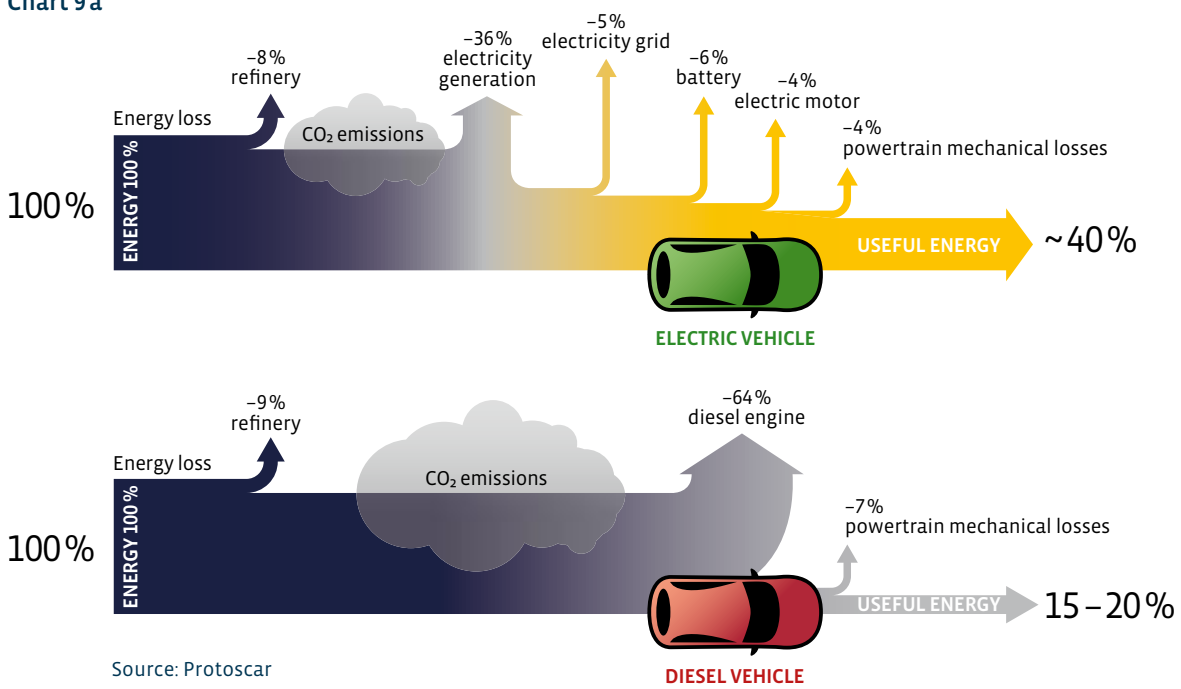
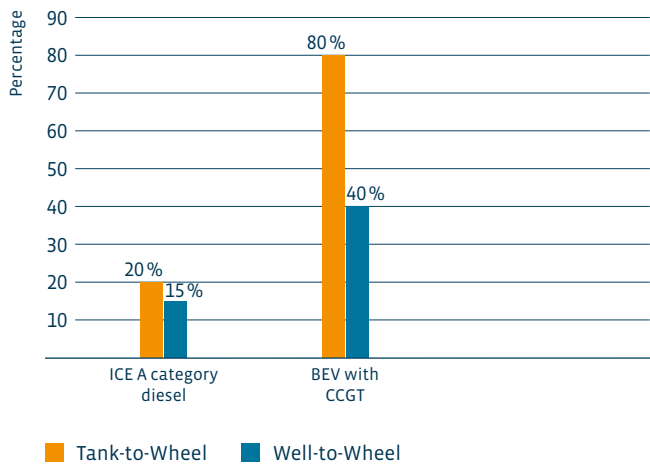
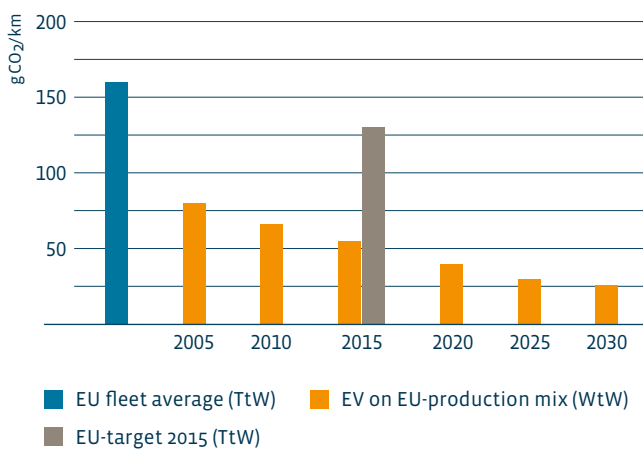


Chart 9 b: Efficiency comparison



Source: Protoscar

Chart 10: CO₂ emissions for private cars in the EU context



Source: Eurelectric

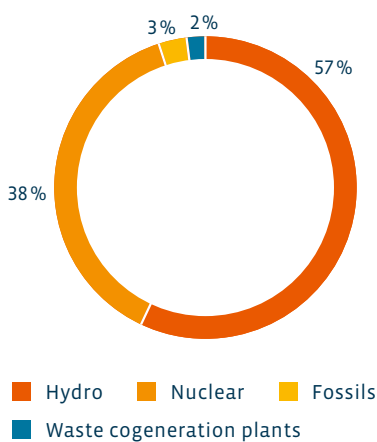
4.4 Carbon intensity of European electricity

The generation fleet of European countries is not only comprised of up-to-date, modern power plants with high efficiency. There are also plants belonging to an older, less efficient generation. The primary energies (coal, gas, hydro, nuclear) used are also different. The share of renewable energies (hydro, wind, solar, etc.) in the generation mix varies much across the continent. Therefore, the specific CO₂ emissions from electricity generation (g CO₂/kWh) differ greatly between European countries.

In 2005, the average EU mix had specific CO₂ emissions of 410 g/kWh. Replacing conventional internal combustion engine vehicles with electric vehicles (EVs) would result in major reductions in CO₂ emissions. With the current carbon intensity of the European electricity production mix, a typical electric car produces CO₂ emissions of around 80g/km. This compares favorably to the current EU market average of CO₂ emissions from passenger cars – about 160 g/km.

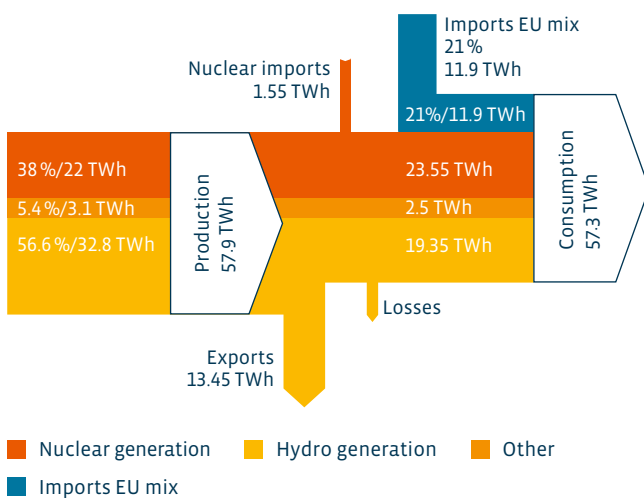
However, the European electricity sector will reduce its carbon intensity over coming years, particularly with increased use of renewables and carbon capture and storage. EURELECTRIC estimates that the carbon intensity of EU electricity in 2030 will diminish to 130g/kWh, resulting in emissions from electric cars of less than 30 g of CO₂ per km (0.18 kWh/km EV consumption, chart 10).

Chart 11: Swiss electricity production mix 2005



Source: Swiss energy statistics 2005, SFOE

Chart 12: Swiss generation and consumption mix (2005)



Source: SFOE, electricity mix, December 2007

4.5 Carbon intensity of Swiss electricity

In Switzerland, the generation mix is practically free of CO₂. Only 5% of electricity generation comes from fossil or waste cogeneration plants. 57% of the Swiss electricity is produced from hydro, while the remaining 38% comes from nuclear plants (chart 11).

The Swiss generation mix will remain CO₂ free since additional capacity will come from renewable sources (hydro, wind, solar, all free of CO₂), combined cycle gas turbine power plants (with an obligatory 100% compensation of CO₂ emissions), or nuclear plants (free of CO₂). Compared to the EU mix, Swiss electricity generation is much cleaner.

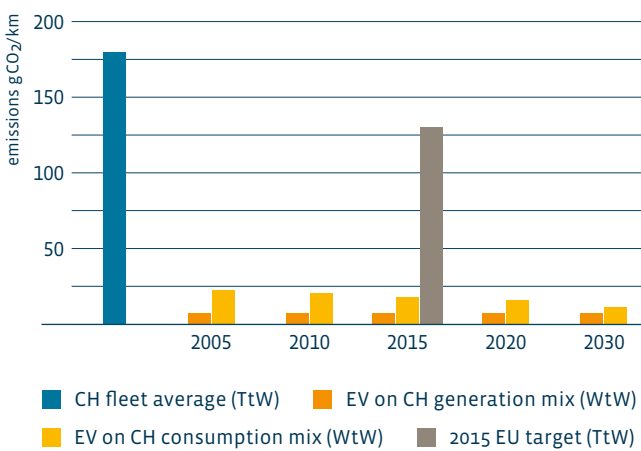
Taking into account imports and exports, the Swiss electricity consumption mix is slightly different, since 21% comes from EU imports (chart 12).

Since the EU generation mix is not CO₂ free, the Swiss consumption mix has a higher CO₂ content than the Swiss generation mix. But the Swiss electricity consumption mix will also benefit from the future decarbonation of the EU mix as follows.

	2005	2010	2020	2030
Electricity	g CO ₂ /kWh	g CO ₂ /kWh	g CO ₂ /kWh	g CO 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 Including fossil and waste cogeneration

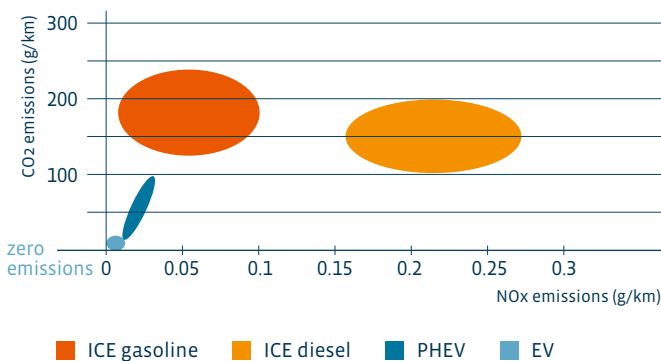
Chart 13: CO₂ emissions of private cars in Switzerland



With the current carbon intensity of Swiss electricity, a typical electric car emits less than 7 g CO₂/km from the generation mix, amounting to 23 g CO₂/km from the consumption mix. This typical electric car engenders global CO₂ emissions savings (Well-to-Wheel) of around 160 g/km compared to the national fleet average in Switzerland today. In 2015, the CO₂ reduction in Switzerland is projected to still remain higher than 100 g/km compared to the 2015 EU target (chart 13).

Even considering the future technology standards required by the 2015 EU Target, Swiss EVs retain a tremendous comparative advantage with respect to internal combustion engine vehicles thanks to the high quality of Swiss electricity.

Chart 14: Local air pollutant emissions (TtW), average European private car



4.6 Reduced city pollution

Using electricity as an alternative fuel for the transport sector would result as well in drastic reductions in local air pollutants (CO₂, NO_x, small particulates) emitted in cities (chart 14).

4.7 A diversified supply

The use of electricity also ensures maintaining a diversified supply of energy for road transport, since:

- Electricity is not a primary energy
- Electricity can be generated from different primary energy sources (renewable, oil and gas, coal, nuclear)







5. Vision 2020 for future clean mobility

A massive adoption of EVs in the Swiss fleet of private cars would significantly help to reach the ambitious goals of Switzerland's climate and energy policy, whereas a limited EV market penetration has only marginal interest for its environmental strategy.

A massive switch to EVs will not be sufficient by itself however to meet the goals of Switzerland's climate and energy policy. Several other measures are necessary for this purpose, such as improving public transportation in cities, upgrading town and country planning, facilitating transport mode changes (e. g. parking lots near railway stations), etc.

Biofuels and hydrogen are possible alternatives to fossil fuels like gasoline, diesel or compressed natural gas (CNG), but these substitute energy carriers have not yet reached sufficient maturity. Biofuels can substitute traditional fuels only in limited quantities because only secondary vegetal material can be taken into account (in order to avoid competition for food production), whereas hydrogen has still to overcome the main hurdle, the installation of a brand new distribution network. In contrast, a sufficient electric network infrastructure already exists in all developed countries.

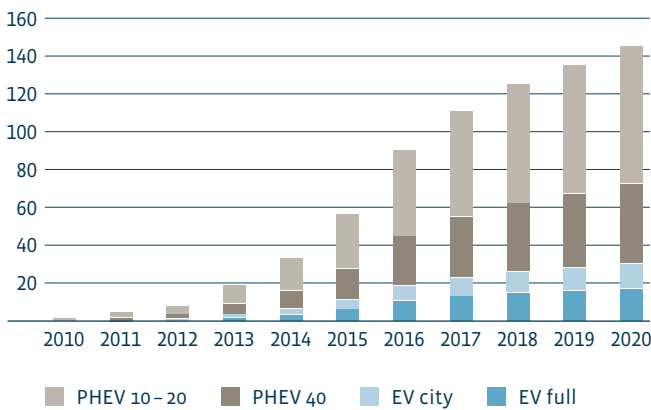
For private cars, it appears that a path towards total electrification is unavoidable simply because it represents the best solution from a global energy efficiency point of view and because no viable alternatives exist. In the long term (2050?) nearly all new cars will therefore be powered by electricity. Even the hydrogen for fuel cell vehicles may be produced primarily by electricity, since generating hydrogen by electrolysis is both more efficient and more environmentally friendly than reforming natural gas.

The penetration of EVs in the Swiss national car fleet should meet the following conditions:

- The business framework is that of a free market with competition as the main driver.
- Within this context, all services and goods are fully paid by the beneficiary.
- Internalization of external costs could become governmental policy but should remain neutral from a fiscal point of view.
- Clean electric cars must be able to offer sufficient performance so as to meet market requirements. This also means that the total cost of ownership (TCO) will have to be competitive.
- Original Equipment Manufacturers (OEMs) must be able to supply enough pluggable cars – i. e. battery electric vehicle (BEVs) and plug-in hybrids (PHEVs) – to satisfy the Swiss market.

Chart 15 a: New cars according to VISION 2020

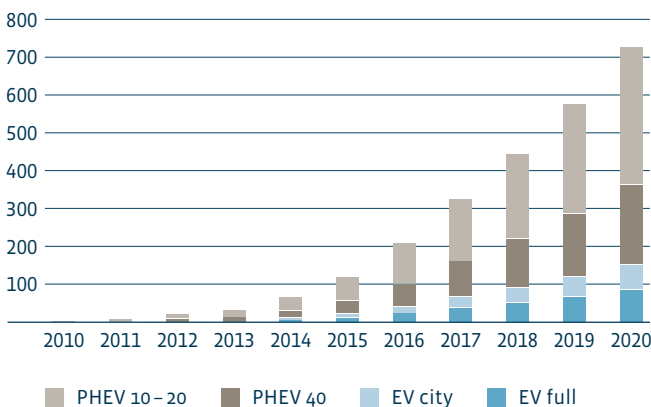
(in thousands)



Source: Protoscar

Chart 15 b: Cumulative cars according to VISION 2020

(in thousands)



Source: Protoscar

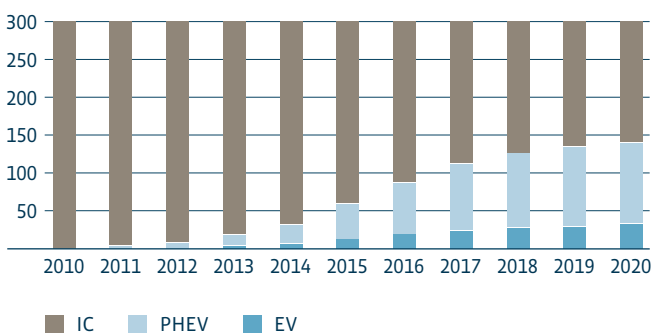
5.1 Our vision

By 2020, the Swiss national car fleet will comprise 720,000 electric pluggable cars (PHEVs and BEVs), roughly 15% of the total. To realize this goal of 15% EV penetration by 2020, important EV-related promotional measures are necessary on both the supply and demand sides.

Average market penetration for the 2011 – 2020 period should therefore be around 70,000 clean EVs per year. The buildup should progress incrementally, starting with 2% in 2011 and attaining 50% by 2020. Assuming 300,000 new registrations per year, the yearly share of new EVs should grow to around 100,000 clean EV cars entering the fleet by 2020 (charts 15 a – b).

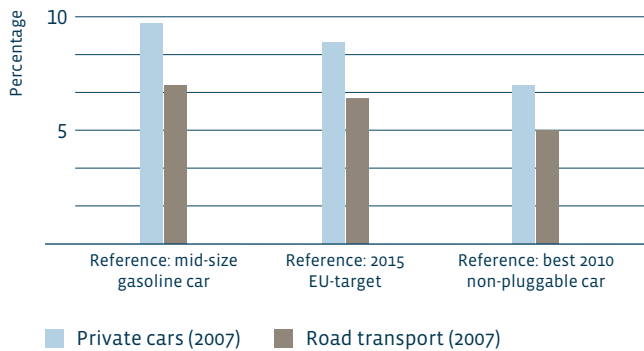
According to research by Protoscar, the supply of all types of EVs by OEMs would suffice to satisfy the Swiss market, provided OEMs consider Switzerland to be of strategic interest.

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



Source: Protoscar

Chart 17: Reduction of CO₂ emissions



After validating the feasibility of VISION 2020 based on sales estimates from both a “demand” and an “offer” point of view, the study by Protoscar resulted in the conclusions seen at left (chart 16).

5.2 Climate and Energy Impact of Vision 2020

The realization of a 15% EV penetration under the Protoscar scenario by 2020 would result in:

- a significant reduction⁶ of 1.2 million t CO₂/year when compared to a benchmark mid-size gasoline car, of 1.1 million t CO₂/year when compared to the 2015 target (130g/km TTW), and 0.86 million t CO₂/year when compared to the best “non-pluggable” technology (reference: mid-size DICI DPF⁷ hybrid, chart 17)
- a reduction of 1.2 million t CO₂/year corresponds to a 9.7% reduction in CO₂ emissions by private cars in Switzerland in 2007
- considerable savings in fossil fuels, amounting to 550 million liters of gasoline compared to a mid-size gasoline car and 420 million liters of gasoline compared to the best “non-pluggable” technology (reference: mid-size DICI DPF hybrid)
- correspondingly important savings on gasoline expenditures
- a small increase of 1.2 TWh in electricity consumption, equal to only 1.8% of the 2007 Swiss electricity generation of 65.9 TWh⁶. This figure would increase to 1.7 TWh (2.6%) if every PHEV (a conservative assumption) was driven 100% of the time on electric power alone
- a required power supply of 1.3 GW during off-peak hours, assuming conservatively that up to 50% of the fleet recharges simultaneously and that there would be no attenuation due to the new features of the “smart grid”

⁶ Assumptions: EV consumption TTW=18 kWh/100km, 12,800 km/year average European mileage, PHEV40 driven 80% electric while PHEV10 – 20 only 50%, Swiss generation mix.

⁷ Direct injection compression ignition diesel particle filter (DICI DPF).

6. Meeting Vision 2020

6.1 Establish Switzerland as a showcase for EVs in the EU

Switzerland could play a pioneering role in the development of electric individual mobility.

Switzerland has one of the largest numbers of cars per household in the world and uses more fuel and emits more CO₂ per vehicle than the EU average, at 180 g CO₂/km compared to 160 g CO₂/km in the EU.

Swiss incomes, living standards and willingness to spend on car expenditures are high. At the same time, public environmental sensibility is widespread and plays a major role in the national political agenda.

As electricity in Switzerland is practically free of CO₂ and will remain so, the country has maximal leverage for climate improvement. Since Switzerland has no fossil energy resources (coal, oil, or natural gas), there is no national “preference” for a given fossil primary energy that could induce a political bias. Switzerland represents one of the best initial test markets for EVs/PHEVs due to:

- Its “car neutrality” (no national manufacturer, three distinct cultural areas)
- Its indirect participation in the EU with its car-related rules
- Its particular geographic situation in central Europe
- Its relatively high income level

6.2 Why a strong strategy is needed

Despite Switzerland possessing all the intrinsic characteristics of an ideal pilot country, the analysis of the unsuccessful first generation of EVs and the results of the

pilot projects show that to meet VISION 2020 a strong strategy must be implemented.

To rely only on the market or to implement a simple strategy based on creating economic and mobility advantages for EVs/PHEVs together with establishing a recharging infrastructure is not enough, because:

- There are many emotional aspects and psychological barriers to overcome, such as apprehension, skepticism, feelings of lost freedom (due to the limited range and the long recharging times for EVs), etc.
- The lack of a public charging infrastructure increases all these anxieties.
- EVs/PHEVs are perceived as revolutionary objects in the very conservative car world (on both demand and supply sides) and will continue to be so perceived in the next few years at least, thus the conditions to allow their acceptance must be prepared.
- The commercialization of clean cars has met with little success to date: dealers must act more like consultants to promote these vehicles.
- The EVs/PHEVs for sale should be desired by the public; economic advantages could make them affordable but people must also wish to have them.
- There are complicated and diversified cantonal road tax systems.
- In past years OEMs have created some skepticism about their will to manufacture clean cars.

These topics show that the strategy to be implemented must necessarily be based on a multidimensional approach that involves not only the vehicle itself but also everything around it.

6.3 A multidimensional approach

A multidimensional approach means that the strategy should aim for three main goals:

- to create an EV culture, i.e. present the emotional and rational knowledge and experience accumulated so far in order to break down the psychological barriers blocking acceptance of EVs/PHEVs due to their “revolutionary” perception: this involves much more than creating a simple interest;
- to create favorable framework conditions; a vehicle must insert itself within the general road transportation structure, with its infrastructure, political guidelines (taxation) and so on. These external conditions must be planned and implemented so as to benefit EVs;
- to have high quality and emotionally appealing vehicles that people want to own and can afford, i. e. set up economic advantages for EVs/PHEVs.

These goals are strongly interconnected as they mutually influence each other and require diversified measures and increased numbers of stakeholders for implementation.

6.4 Implementing the strategy

In order to implement the strategy, the measures required for reaching the goals must first be defined.

The measures for developing an EV culture must focus on:

- education
- PR/communication
- research
- network building

The EV culture should not only be directed at potential customers, but at society in general. It is very important for car dealers to maintain their specific activities, as without their support the EVs/PHEVs cannot be successful.

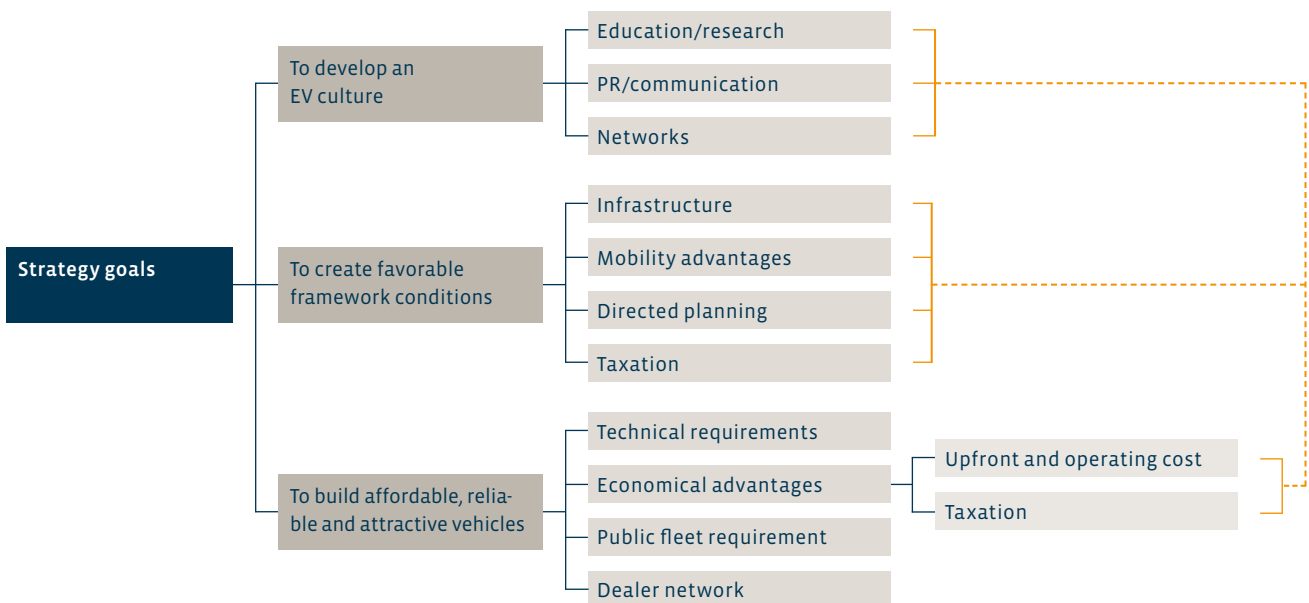
Besides the development of an “EV culture”, encouraging academic and private research in EVs/PHEVs will have other beneficial effects, such as new business creation and solutions for building better and more attractive EVs. A network must be established amongst all the organizations involved or potentially interested in EVs/PHEVs so as to create a strong EVs/PHEVs community with greater influence on society’s general strategic choices.

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

- Implementing a recharging infrastructure;
- Establishing transport policies that favor EVs/PHEVs;
- City transport planning that takes into consideration the requirements of EVs/PHEVs regarding space and infrastructure;
- Implementing a tax system based on emissions and energy consumption.

To obtain high quality and emotionally appealing vehicles that people want to own and can afford to buy, the measures must focus on:

- Establishing economic advantages with respect to upfront costs and taxation;
- Establishing economic advantages with respect to operational costs;
- Defining technical requirements for building high quality vehicles;
- Building a specialized, multi-brand dealership network and providing support for OEMs without a Swiss network;
- Obliging public fleet operators to adopt a determined quota of EVs/PHEVs.



These measures are aimed in various directions that can be summarized as follows:

- Legislation and policy
- Technical
- Economic/financial
- PR/communication
- Education/research

The wide range of these measures implies the participation of different stakeholders:

- Private partners involved in technical measures;
- OEMs involved in technical, economic/financial, PR/communication and education/research measures;
- Electricity concerns involved in technical, economic/financial, PR/communication and education/research measures;
- Political and public bodies issuing rules and regulations (the Swiss Confederation, cantons, and municipalities/cities) involved in legislative measures;
- Academic/training entities involved in education/research measures.

	Legislation and policy	Technical	Business development	PR and communication	Education and research
Private companies		X	X	X	
OEMs		X	X	X	X
Electric utilities		X	X	X	X
Political and governing bodies	X				X
Universities		X			X

7. Next steps

7.1 Establish Switzerland as a showcase for EVs in the EU and communicate VISION 2020

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

- Unify existing EV promoters
- Rally new supporters

To that end, Alpiq will introduce a web page dedicated to “green” electric cars and VISION 2020 on its web site, www.electricitepourdomain.ch and www.immergenug-strom.ch, in order to receive suggestions, comments and working proposals.

7.2 Pre-competitive 2020 Coalition of Interest

There is a great need to standardize the recharging infrastructure and interface equipment in this field. New standards must in any case be internationally defined to accommodate the Japanese, American and European markets. These standards must be open and non-proprietary to allow rapid acceptance of EVs, both internationally and in Switzerland. This normalization must be done at the international level, as 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 stakeholders involved is therefore essential in this framework of multidimensional actors that must be inserted into the global picture.

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

This broad coalition of interest is pre-competitive and non-exclusive in an initial step. Alpiq recognizes however that, in a second phase, competitive industrial partnerships for the 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 the others with ensuing synergies.

7.3 Joining the 2020 Coalition of Interest

Alpiq is sending out a call to join the 2020 Coalition of Interest to every interested party who believes that:

- Individual mobility should remain a basic freedom but its impact in terms of emissions and fossil energy dependency must be reduced and the Well-to-Wheel efficiency improved.
- The electrification of vehicle powertrains is an irreversible trend.
- Any discussion regarding energy efficiency and vehicle emissions must be done on a Well-to-Wheel basis instead of a Tank-to-Wheel basis.
- It is better to lead the trend instead of being a follower.
- Switzerland, being a neutral, multicultural and wealthy nation, is the right place to begin EV/PHEV promotion.
- Switzerland should be the leader in encouraging and promoting this trend by playing a pioneering role in the development of individual electric transportation.
- This long-term project must start now to be effective in 2020.
- The realization of this vision requires a multidimensional approach. All the different aspects have equal importance and must be pursued with the same amount of effort.
- The multidimensional approach requires the collaboration of a variety of stakeholders. Building a Swiss pre-competitive coalition of interest with all parties involved is therefore essential.

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