Swiss Power-to-X Collaborative Innovation Network
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Political And Regulatory Framework Conditions For Power-To-X In Switzerland

Peter Metzinger, 26.01.2026

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1. Introduction And Conceptual Framework

Switzerland pursues the long-term objective of defossilizing its energy system, strengthening security of supply, and safeguarding its attractiveness as an industrial and business location. Power-to-X (PtX) – the conversion of renewable electricity into chemical energy carriers such as hydrogen, synthetic hydrocarbons, methanol, synthetic gas, or ammonia – plays a central role in this transformation process.

PtX is particularly relevant in sectors that are technically or economically difficult or impossible to electrify, notably aviation, maritime transport, heavy-duty road transport, the chemical industry, and seasonal long-term energy storage.

Contrary to the prevailing narrative, this also applies to road transport, provided that all factors relevant to the calculation of CO_2 emissions are properly taken into account.

The Swiss Power-to-X Collaborative Innovation Network (SPIN), a network of around 70 stakeholders from industry, science, and the energy sector, has articulated key assessments on the market ramp-up of PtX in Switzerland in several position papers and statements. These assessments, together with practical feedback on the implementation provisions of Article 11a of the CO_2 Act – which regulates the crediting of synthetic fuels in the calculation of vehicle fleet CO_2 emissions – form the basis of this analysis.

The analysis is based on a review of relevant laws, ordinances, explanatory reports, and enforcement regulations, a comparison with regulatory frameworks outside Switzerland, practical experience, presentations, studies, academic publications, media reports, independent assessments, and discussions with investors, project developers, engineers, and other practitioners.

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1.1 Relevant legal framework in Switzerland

The development of PtX is structured by various laws and regulations:

- Bundesgesetz über den Umweltschutz (USG, 814.01): Basic environmental law; defines minimum ecological requirements that flow into the IBTV, the MinÖStG and the CO2 legislation.
- Verordnung über das Inverkehrbringen von erneuerbaren oder emissionsarmen Brenn- und Treibstoffen (IBTV, 814.311.1): Regulates ecological requirements for liquid and gaseous renewable fuels; import requires a permit.
- Mineralölsteuergesetz (MinÖStG, 641.61) and Mineralölsteuerverordnung (MinöStV, 641.611): Define tax exemptions for sustainable fuels in compliance with ecological and social criteria.
- Verordnung des UVEK über den Nachweis der Erfüllung der ökologischen Anforderungen an erneuerbare Treibstoffe (ETrV, 641.611.21): Regulates evidence for the fulfilment of minimum ecological requirements.
- CO_2-Gesetz (641.71): Sets reduction paths; includes Art. 11a zur Anrechenbarkeit synthetischer Treibstoffe In the calculation of the CO2 fleet emissions of vehicle importers.
- Verordnung über die Reduktion der CO2-Emissionen (641.711): Regulates the implementation of the CO2 law.
- Nationale Wasserstoffstrategie (Bundesrat 2024): Defines the expected hydrogen requirement, infrastructure requirements and the role of PtX derivatives for industry, mobility and seasonal storage.
- Bundesgesetz über die sichere Stromversorgung mit erneuerbaren Energien (Revision of the Electricity Supply Act, often referred to as the "Mantelerlass"; StromVG, BBl 2021 1666): Art. 14a StromVG anchors the partial exemption from network usage fees for storage and Power-to-X P+D systems (Art. 14a para. 4 lit. b StromVG)
- Stromversorgungsverordnung (StromVV, SR 734.71): Art. 18 StromVV regulates the formal exemption of the storage without final consumption from the network usage fee, which, depending on the design, also includes Power-to-X systems, provided that they qualify as storage without final consumption.
- CO2-Emissionsvorschriften für Neufahrzeuge

These fundamentals influence the import, production, certification, market access and financeability of PtX in Switzerland. In addition, the Swiss authorities are guided by the applicable laws and regulations of the EU, in particular RED III and its Delegated Acts.

RED III is the current EU directive on the promotion of renewable energies and a central component of the "Fit for 55" package, with which the EU wants to secure its climate goals by 2030 and climate neutrality by 2050. It tightens and replaces the predecessor directive RED II and in particular significantly raises the binding expansion targets for renewables. In doing so, it is strongly oriented towards the All-Electric dogma, which aims to electrify motorised traffic to 100%.

Nevertheless, the Swiss legislator has created a law with Art. 11a of the CO2 Act that deviates from EU legislation on a crucial point and provides Switzerland with a worldwide unique pioneering role in the fight against climate change by giving vehicle importers the freedom to choose whether to reduce their average CO2 fleet emissions by placing on the market of electric vehicles or synthetic fuel. The idea behind it is that CO2 emissions are falling faster if you not only allow one way to avoid emissions, but also others that are complementary and have the same effect.

1.2 Significance of Art. 11a of the CO_2 Act

In Switzerland, importers are subject to CO_2 fleet targets for new vehicles. These are average values for CO_2 emissions per kilometre for passenger cars, vans/light commercial vehicles and, newly, also for heavy commercial vehicles, which must not be exceeded. Exceeding leads to sensitive sanctions.

Current target values from 2025

- New passenger cars, which are registered for the first time in Switzerland, have been allowed since 1. January 2025 in the fleet average maximum CO_2/km (WLTP).
- For new vans and light semi-trailers (up to 3.5 t), a fleet target of 153.9 g CO_2/km applies in the same period.

Heavy commercial vehicles

- Since 2025, CO_2 target values have also been applied for new heavy commercial vehicles (trucks and semi-trailers) for the first time.
- Importers must reduce the average CO_2 emissions of this new vehicle fleet by 15% compared to the EU reference value 2019/2020.

Originally, these fleet emission targets were intended to stimulate the sale of electric vehicles.

However, Art. 11a of the CO_2 Act has now allowed vehicle importers since 2025 to meet CO_2 fleet targets through the use of synthetic fuels. This makes Switzerland a pioneer of technology-open regulation and enables:

- The economic use of all by-products in the production of synthetic kerosine via Fischer-Tropsch synthesis (FT diesel, FT naphtha, FT gasoline),
- Improved investment security,
- A market-based and technology-neutral compensation system in road traffic,
- The continuation of combustion technologies complementary to electrification while at the same time, real reduction or avoidance of fossil CO_2 emissions - something for which a solution has been sought in the EU for a few years.

For producers of synthetic kerosine, a market such as road traffic is essential in order to be able to operate such plants economically, since the production of synthetic kerosine produces technically unavoidable secondary fractions: diesel, gasoline, waxes and other hydrocarbons.

This fact has been overlooked or ignored in EU regulation – with significant investment-inhibiting effects.

2. Strategicly embedding Power-to-X in Swiss energy policy

2.1 PtX in the context of the Energy Strategy 2050+, Energy Perspectives and Hydrogen Strategy

The Energy Strategy 2050+ and the Energy Perspectives 2050+ define PtX as a component of a net-zero system, but without a comprehensive industrial policy funding regime, as is customary in other countries. The national hydrogen strategy complements this with:

- SScenarios for the future Swiss H_2 needs,
- The need for international connecting infrastructure,
- The recognition of synthetic energy sources as a means of diversification and resilience.

However, from SPIN's point of view, there is a lack of a consistent PtX overall strategy that combines clear objectives, supportive regulation, infrastructure, market design, and export/import logict.

2.2 Importance of Art. 11a CO_2 Act for the PtX industry

Art. 11a of the CO_2 Act states the following. If a vehicle importer ensures that a certain amount of synthetic fuel is fed somewhere into the petrol station network, he can have this credited as a reduction compared to fossil fuel when calculating CO_2 fleet emissions. For the exact calculation, there is a formula in the CO_2 Regulation (Annex 4b to Art. 26b):

Calculation of the reduction in passenger cars, vans and light semi-trailers

*RedST = ST * EFref * 1 000 000 / FL g CO2/km*

RedST:	CO_2 reduction by crediting each type of synthetic fuel as a sum in g CO_2/km
ST:	Quantity of the synthetic fuel to be credited according to the assigned certificates of origin in accordance with Article 92c, energy contained in kWh
EFref:	Emission factor of the fossil fuel to be replaced according to Annex 10, converted into t CO_2/kWh
FL:	Average lifetime mileage in km: 175 000 km

This formula is used to calculate how much synthetic fuel must be placed on the market in order to include a vehicle of a certain type with 0 g CO2/km in the calculation of fleet emissions.

With Article 11a of the CO_2 Act, Switzerland has therefore created an internationally regarded instrument that allows the cretability of synthetic fuels to be recognised for fleet emission targets.

Importers are enabled to achieve their CO_2 fleet values both through electromobility and complementary through the use of synfuels in the existing fuel system. This creates the necessary technological openness at the legal level and an internationally unique investment signal.

The mechanism of Art. 11a:

- Enables a market-effective demand for PtX,
- Allows the use of all output fractions of a Fischer-Tropsch system,
- Also allows the construction of production facilities abroad that produce specifically for Switzerland - in regions where large quantities of renewable energy can only be harvested if they are chemically stored (similar to the company HIF with its plant Haru Oni in Chile produces for Porsche in Germany),
- Strengthens the banking capacity of investment projects,
- - unlike the EU - prevents a structural ban on investments for Power-to-Liquid (PtL).

This makes Switzerland a potential “safe haven” for PtX investors. So it is not surprising that SPIN has already received initial inquiries from an export organisation of a foreign state and are among its members with HIF and Parafuels producers from abroad.

3. Regulatory challenges in Switzerland

3.1 CO_2-Ordinances

While the CO_2 law adopted by the parliament specifies the legislative framework, the CO_2 regulation adopted by the Federal Council describes how the law is to be implemented in detail. Due to the complexity of the topic and other factors, there are discrepancies from time to time. For the sake of clarification, we list individual examples from the current CO_2 regulation below that show where there is still a need for improvement in order to enable or facilitate the start-up of Power-to-X.

The emission factor EFref: this is a factor that serves to calculate how much fossil CO2 is avoided by the use of synfuel / eFuels. The higher this factor, the less synfuel must be produced in order to enable a certain emission reduction. This also reduces the cost of avoiding CO2 emissions by synfuels.

The EFref is recognised in the regulation at 73 g CO_2/MJ. The basis is a tank-to-wheel perspective, which means that one only considers the CO_2 emissions that arise during

the combustion of the fuel. Emissions caused by the exploration, transport and processing of crude oil are neglected. Analogously, the assessment of the climate-friendliness of electric vehicles neglects which CO_2 emissions arise during the extraction and processing of raw materials up to vehicle production.

With a holistic, well-to-wheel perspective or life cycle analysis, the EFref would be ~94 g CO_2/MJ. The higher this value, the more expensive it is for importers to reduce their CO_2 emissions using synthetic fuel. As a consequence of this, electric drives are favoured over climate-neutral combustion engines even if they cause higher CO_2 emissions overall. From the point of view of climate protection, this is problematic.

Life cycle analyses in Switzerland are actually generally the basis for legislative processes. The fact that an exception is made when calculating fleet emissions of vehicles is a political decision that is not comprehensible in a purely factual view.

The resulting inconsistency leads to the fact that the import of renewable synfuel is slightly more expensive than paying CO2 sanctions, according to SPIN calculations. This could also be formulated in such a way that indulgence trading is favoured over actual emissions avoidance.

Consequence: synfuels are mathematically belittled and artificially made more expensive.

Life driving performance: Excessive lifetime driving performance recognised in the draft regulation:

- PW: 175,000 km compared to ~165'000 km, as specified by Auto Schweiz
- Truck: also over-high

→ This also increases the necessary synfuel quantity per vehicle and makes sanctions cheaper than synfuels.

Assignment of synthetic fuels to individual vehicles

The crediting of synfuels is done by feeding into the general petrol station network. This is then credited to a vehicle importer when calculating the CO_2 emissions. For a vehicle that is to be included in the calculation of fleet emissions at 0 g CO_2/km, the amount of synfuel must be fed into the distribution network, which this vehicle statistically consumes during its lifetime mileage. The corresponding formula can be found in Annex 4 to Article 26b of the CO_2 Regulation (see above). The higher the lifetime mileage in the formula, the more synfuel is needed and the more expensive

the certified CO_2 avoidance becomes. If the actual average lifetime mileage of passenger cars in Switzerland and an EFref based on an LCA had been correctly taken as a basis, then Switzerland would already be a market for the increase in power-to-liquid production, because the avoidance of CO_2 emissions would then be significantly cheaper than the indulgence trade in CO_2 sanctions.

An assignment to a single vehicle whose fuel requirement of its lifetime mileage has already been fed into the distribution network would be purely mathematical for the reasons mentioned above and it would not matter where and with what the vehicle is specifically refuelled.

Nevertheless, the CO_2 avoidance could be attributed to individual vehicles and they could be neutralised as CO_2-neutral. This would enable a "state-approved" commercialisation of synfuels vehicles, which would allow importers to at least partially refinance. Unfortunately, this is not provided for.

Although vehicle importers could also declare a vehicle as a "synfuels vehicle" with a "note in the glove compartment", it could not be checked whether they would actually only charge the real amount of imported eFuel. Here, an assignment would create clarity and prevent greenwashing.

SPIN therefore calls for:

- Visibility for synfuel zero-emission vehicles,
- Strengthening transparency and consumer acceptance.

CO_2-Sources

For the necessary CO_2, biogenic sources, unavoidable industrial emissions with exit deadlines and direct air capture are defined as permissible, creating a limited and partly only temporarily available CO_2 pool, which significantly influences the planning, investment security and cost structure of many PtX projects.

However, it makes no sense to prohibit the energy-efficient and cost-effective capture of a CO_2 molecule directly from an industrial chimney (CCU = Carbon Capture and Usage), but at the same time to allow the identical molecule to be removed from the atmosphere a few metres away by means of direct air capture (DAC) very energy-intensive.

From a purely physical point of view, the line would have to be drawn where CCU could create an incentive to specifically extract fossil carbon.

This risk must be weighed against the advantage that the recycling of unavoidable CO_2 reduces fossil emissions in traffic in real and immediately, because recycled carbon replaces fossil carbon.

This approach also coincides with the recommendations of the eFuel Alliance (2024), that industrial process CO_2 should remain permissible until 2050, if it would otherwise inevitably be emitted (e.g. Cement/clinker), and when at the same time a path to real biogenic or atmospheric sources is being prepared.

Duration of authorisation and investment barriers

In addition, there is the organisation of the authorisation procedures. Power-to-X systems generally only receive a six-year authorisation and no warranty for renewal, even if nothing changes to the system in the 6 years. Such investments must be amortised in terms of business management over at least 15 years.

Regulation against the will of the legislator

Even where the legislator wants to explicitly support Power-to-X technologies, such as the network fee exemption in Switzerland for pilot and demonstration systems, these are implemented by independent interpretations of the authorities in such a way that technically feasible Power-to-X systems are effectively prevented by regulation.

3.2 Mineral oil tax legislation

Mineral oil tax exemption: synfuels can only be exempted from mineral oil tax with certification based on life cycle analysis according to the Swiss model, but not with European RFNBO certification, even though this is recognised as equivalent to synfuels in terms of emission reduction eligibility. According to the EU definition, RFNBOs are renewable liquid or gaseous fuels (e.g. green hydrogen and eFuels) that are produced from renewable electricity rather than biomass or fossil raw materials and meet strict EU sustainability criteria. The letters RFNBO stand for "Renewable Fuels of Non-Biological Origin".

This makes it considerably more difficult to develop viable business models and thus to implement the will of the legislator (Art. 11a).

On top of that, there is a certain inconsistency in the regulation. While synfuels as such are only recognised on the basis of a life cycle analysis, such an analysis is explicitly rejected for the calculation of CO_2 emissions.

Duration of registration and amortisation: Production facilities are only approved for 6 years. Whether the authorisation will be renewed afterwards, if nothing has changed significantly in the plant in the meantime (but perhaps in the regulation) is open. There is no guarantee of stock (in English: Grandfathering).

However, PtX systems require 15-20 years of regulatory security.

Otherwise:

- No bank financing,
- No investments,
- No production.

3.3 Electricity Supply Act

Electricity supply: The eFuel Alliance criticises that the EU rules on the purchase of electricity for Power-to-X systems hinder the market ramp-up of RFNBOs by too strict requirements on additionality, temporal and geographical correlation.

Additionality: The electricity must come from new or explicitly assigned EE systems (PPA or direct line), with a maximum of 36 months before the electrolyser before the electrolyser. In grid zones with a very high EE content or very low emission intensity, simplified rules are provided for, so that grid power can also be considered fully renewable. The additionality rules also require that the assigned EE facility does not receive any significant state investment or operating subsidies, so that it is clear that it is additionally created precisely by the RFNBO demand.

Temporal correlation: Until the end of 2029, a monthly allocation is usually sufficient: Generation and RFNBO production must take place in the same month. From 2030, in principle, hourly (sometimes even finer) allocation is required, so that RFNBO electricity may only be credited in hours with proven EE generation.

Spatial correlation: Renewable generation plant and electrolyser must be located in the same bidding zone or in directly coupled zones in which electricity is physically available.

Although various studies show that such strict rules are needed to safely prevent the electricity supply of the electrolyser from missing electricity somewhere in the grid, which must then be produced in fossil, these studies do not investigate what happens if everything continues to run as before due to lack of meeting the criteria. The CO_2

emissions, which continue to be generated by the burning of fossil fuel instead of renewable fuels due to inaction, are not part of these studies. Research would still be needed here, not only by comparing the CO_2 emissions of different solutions, but also by making a comparison with the situation due to inaction. Under certain circumstances, there may be an average of fewer CO_2 emissions over a longer period of time if you accept that the operation of electrolysers is not 100% CO_2-neutral than if you let everything continue as before.

These rules would also have to be relaxed in the sense of technological neutrality. Because if they were also allowed to apply to charging stations for electric vehicles, this would also make the politically desired electrification of mobility enormously more expensive to make it impossible.

From this point of view, in particular, the demand for additionality - according to which the electricity comes from new, non- subsidised or only limited EE systems and these must be closely linked to the commissioning of the electrolyser - acts as a massive investment hinderance and makes synfuels quite expensive. The required close temporal correlation (transition from monthly to hourly) also makes it difficult for the electrolysers to operate economically, since the production is then strongly linked to volatile EE feed-in and administratively complex to prove. The Alliance therefore pleads for relaxed rules, such as a postponement of the additionality requirement to 2035 and the maintenance of a monthly time correlation in order not to stifle investments in PtX facilities in Europe.

SPIN therefore demands: no 1:1 takeover of the EU's detailed regulation.

3.4 StromVV (Electricity Supply Ordinances)

Although the legislator in the federal law on the secure electricity supply with renewable energies (revision of the Electricity Supply Act, often called "Mantelerlass") provided for an exemption from Power-to-X systems - until a cumulative installed capacity of 200 MW is reached - from the network fee, this was only partially implemented in the ordinance. The network fee has been divided into its components and only part of it can be refunded.

Another problem in this context arises from the interpretation of this exemption by the Federal Office of Energy in connection with the Climate Protection and Innovation Act (KIG).

Grid-operated storage and power-to-x systems can flatten load peaks, reduce bottlenecks, and absorb excess power, reducing the need for grid expansion and reserve capacity. The refund or According to the legislator, exemption from the network usage fee (Art. 14a StromVG) is intended to specifically exempt from the levy those quantities that are stored after network purchase and returned to the grid or to other energy sources in order to honour these system-using services. In the opinion of the legislator, this is not a subsidy. However, when the first call for funding from the KIG was made, many projects that had submitted a pre-proposal had to do without a proposal because they were told by the BFE that the network fee exemption was a subsidy and that either one had to opt for it or for a KIF subsidy, but not both could be obtained. Without the exemption, however, the first demonstration and pilot installations are not possible even with KIG funding.

3.5 Banking Regulation

Without wanting (and being able to) go into detail, we would like to refer at this point to statements by experts.

A member of SPIN was promised the promotion of a pilot plant by the federal government. As is customary with the funding practice in Switzerland, however, the money only flows when the plant is built. The company therefore needs a bridging loan from a bank. However, no bank was willing to guarantee a bridging loan - although such a loan is optimally secured by the funding commitment from the federal government. In conversations with bank representatives, they stated that the current banking regulations make such loans impossible.

In a nutshell, one often hears: "If today's regulation had been in force 150 years ago, Switzerland today would have neither a railway network nor the Gotthard tunnel."

4. Market Design & Investment Dynamics: Example EBS Wasserstoff AG (Seewen)

The decision of EBS Wasserstoff AG to stop the construction of a 5-6 MW hydrogen plant in Seewen for the time being is a relevant example of the investment hurdles:

- Investment volume: 16.8 Mio. CHF
- Potential: supply of up to 100 heavy commercial vehicles per day

- Climate impact: 7.8 million kg of annual CO2 savings

The pause - despite mature technical planning and a strong partner structure (EBS Energie AG 60%, A. Käppeli's Söhne AG 25%, Industrielle Werke Basel 15%) - clearly shows:

- Lack of binding demand and price structures,
- Persistent regulatory uncertainties,
- Insufficient risk allocation by the state,
- Lack of long-term planning security in infrastructure & market rules,
- Unequal treatment compared to fossil alternatives,
- High sensitivity of investors to future regulatory details,
- Lack of reliable framework conditions for green hydrogen in Switzerland.

The project shows by way of example that current market conditions are not sufficient to trigger investments even in technically mature, ecologically effective and privately structured projects.

SPIN interprets the case – as well as others and the liquidation of a power-to-methanol pioneer – as a concrete warning.

Without predictable demand and price signals and without reliable regulatory stability, even fully or well-developed projects will not be realised – and the market ramp-up is unnecessarily delayed.

The singling in Seewen therefore does not show a technical bottleneck, but a governance, regulation and market design problem:

Investments are not triggered as long as regulatory details remain unclear, political signals are inconsistent and negative learning curves of EU regulation are repeated.

5. EU regulation as a systemic investment risk

The eFuel Alliance identifies several central obstacles that structure the European market for synthetic fuels:

- Inadequate quota regulation in RED III,

- Supercomplex delegate acts on additionality, temporal and geographical correlation in the purchase of electricity,
- De facto exclusion of road traffic from 2035,
- High regulatory uncertainty due to ongoing revisions of the specifications.

Too few FIDs despite large project pipeline

Under these conditions, hardly any investors are willing to put the necessary sums into larger projects for the production of synthetic fuel.

According to several analyses and industry surveys, this leads to:

- an extremely low rate of final investment decisions (FID),
- delays or cancellations of major projects (Shell, Ørsted, Iberdrola),
- the risk of European eFuel production moving to countries with clearer rules.

The eFuel Alliance describes the EU Ptx Regulation as "structurally hostile to investment" because it contains detailed requirements that are technologically and energetically impracticable (e.g. hourly time correlation) and can hardly be implemented in real-world operations.

This is reflected in the figures: of around 300 Power-to-X projects known to the eFuel Alliance, only a few per cent have received a final investment decision (FID). And this is despite the fact that many projects would be technically mature and could be implemented immediately – if it weren't for the restrictive regulations. Absurdly, it is precisely this consequence of overly strict regulation that is being used by all-electric lobbyists as an argument against synfuels and as a justification for even stricter regulation, thereby confusing cause and effect.

Globally, the absolute number of projects without FID is likely to be even higher, and the percentage with FID significantly lower: in small Switzerland alone, there are almost 50 projects, none of which are listed on the eFuel Alliance's production map. (https://www.efuel-alliance.eu/de/efuels/efuel-produktionskarte). Die technischen und geographischen Potenziale sind enorm, wie etwa der PtX-Atlas des Fraunhofer-Instituts zeigtThe technical and geographical potential is enormous, as shown by the PtX Atlas published by the Fraunhofer Institute. (https://maps.iee.fraunhofer.de/ptx-atlas/).

Lack of e-SAF capacity development by 2030

The consequences of this policy are already becoming apparent. The overly strict requirements for electricity procurement, CO_2 sources and project approvals are massively slowing down the development of an industrial power-to-X infrastructure. As a result, the e-SAF that the EU and Switzerland stipulate as a mandatory additive in air transport is also likely to be in short supply from 2030 onwards. Under current EU law, aviation fuels must contain a minimum proportion of synthetic fuels (RFNBO kerosene) of 0.8% from 2030 onwards, with a significant increase in subsequent years. In order to be able to provide these quantities in time, power-to-X plants would have to be planned, financed and built on a large scale today. Instead, regulations that are not technology-neutral and based on unrealistic assumptions are preventing the necessary investments from being made – with the result that key climate targets in aviation and beyond will be almost impossible to achieve.

Significance of the eligibility of synfuels

This is where the importance of synfuels' eligibility comes in. While airlines in the EU and Switzerland are legally required to blend 0.8 per cent synthetic kerosene with fossil kerosene from 2030 onwards, there are no signs of any investment efforts to build the necessary production infrastructure. Waiting, hoping and ignoring the facts also carries the great risk of delaying climate targets in this sector.

Role of the automotive industry as initial investor in synfuels

On the other hand, it is a fact that is often overlooked or downplayed in politics – especially in the EU – that investments in the first production facilities were and continue to be made by the automotive industry. If there had not been so much resistance to the eligibility of synthetic fuels in Switzerland initially and if they had been introduced more quickly, an Audi-financed power-to-liquid eDiesel plant would now be up and running in Laufenburg. The first industrial power-to-liquid/ePetrol plant was then built for Porsche in Chile.

For Switzerland, this means:

- Opportunity to avoid EU misregulation,
- develop investor-friendliness as a locational advantage.6. Governance-Herausforderungen der Schweiz

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6. Governance challenges facing Switzerland

Three key problem areas:

6.1 Regulatory consistency

Article 11a is technology-neutral – the detailed rules are not. The handling of life cycle assessments is contradictory and inconsistent..

6.2 Market and risk allocation

Lack of carbon contracts for difference (CCfD), quotas, tax clarity (mineral oil tax exemption only applies until 2030 and only for LCA-based certificates) and investment security → projects fail.

6.3 Institutional learning ability

Switzerland could avoid EU mistakes – but is not consistently taking advantage of this opportunity.

7.Influence of EU lobbying

The EU ban on combustion engines was significantly influenced by coordinated lobbying from a closely networked climate think tank and foundation environment. A certain Hal Harvey played a central role in this, financing or strengthening organisations such as the International Council on Clean Transportation, the European Climate Foundation, Agora Energiewende, Agora Verkehrswende and the Climate Neutrality Foundation through foundations and philanthropic structures. Die Zeit, which uncovered his network in July 2022, describes him as the "most powerful Green in the world".

These think tanks provided studies, policy recommendations and, in some cases, concrete legal bases for CO_2 fleet limits and electromobility, which were widely adopted by ministries, the EU Commission and the EU Parliament.

This was accompanied by intensive communication work and direct lobbying activities to build a political majority. Other organisations, such as Transport & Environment, contributed position papers that clearly focused on an all-electric strategy, while

Power-to-X technologies and synthetic fuels were largely ignored or presented as undesirable and misrepresented.

[Quellen: „Hal Harvey – Der mächtigste Grüne der Welt“, Die Zeit Online vom 20. Juni 2022; „Design to Win – Philanthropy’s Role in the Fight Against Global Warming“, California Environmental Associates, August 2007; „The Green Machine“, The Wall Street Journal, Feb. 12, 2007; „Wie China die Klimabewegung gegen den Westen einspannt“; Die Welt, 14.10.2025]

Incorrect assumptions in efficiency comparisons

To this end, these organisations continue to make calculations based on hair-raising – and notoriously false – assumptions. For example, they compare how many battery electric vehicles (BEVs) in Europe could run on wind power from Europe and how many combustion engines fuelled by synfuels could be powered by synfuels from the same amount of electricity. Unsurprisingly, they then conclude that it would be more efficient to use the electricity directly for BEVs.

Synfuels sites and unused wind power potential

However, the problem with this argument is that it is based on a completely unrealistic scenario: the relevant synfuel projects are not planned in Europe, but in regions such as Patagonia, where wind turbines generate up to five times more electricity than in many locations in Europe due to the excellent conditions – electricity for which there are no local buyers due to a lack of demand.

This is relevant for Switzerland because some representatives of our authorities also refer to such bogus studies, for example when comparing efficiency.

Why comparing the efficiency of BEVs and synfuels is misleading

The efficiency comparison is therefore misleading. This is because the electricity produced for synfuels can only be used sensibly in the form of synfuels. Under these conditions, synfuels can be used to power almost as many combustion engines as could be charged with the same primary energy in battery electric vehicles. Not to mention the fact that solar fuels produced by Synhelion do not require any significant amounts of electricity.

Both-and instead of either-or

It is equally wrong to assume that the entire vehicle fleet would have to be fuelled with synfuels. This is usually the underlying assumption of "studies" that conclude

that it is not possible to produce enough synfuel. However, this assumption is incorrect because electrification is continuing to advance and there is no political will to stop it. It would therefore be realistic to assume a mix of BEVs, hybrids and combustion engines, with synfuels only needing to be produced for the – presumably rather small – proportion of combustion engines.

Methodological shortcomings in emissions assessment

Another fundamental problem lies in the methodological consideration of emissions. In contrast to common practice in all other areas of environmental protection regulation, comprehensive life cycle assessments (LCAs) are generally not carried out for vehicles, but only tank-to-wheel emissions are taken into account – with the result that even vehicles fuelled with renewable fuel show CO_2 emissions, even though this fuel is, by definition, practically CO_2-neutral.

Consequences of neglecting life cycle assessments

The CO_2 emissions of supply chains – both in the manufacture of vehicles and in the production of electricity or fuels – remain largely unaccounted for. As a result, battery electric vehicles are considered CO_2 neutral, contrary to better knowledge and physical reality, and are included in the calculation of fleet emissions at 0 g CO_2/km. At the same time, the CO_2 savings achieved through the use of combustion engines with synfuels are underestimated by around 21% because the actual potential along the entire value chain is not correctly reflected.

Regulations without technology neutrality

As a result, the current regulations are anything but technology neutral. They are effectively geared towards enforcing an all-electric strategy and are therefore not in line with physical and systemic realities. Instead of objectively weighing up which technologies achieve the greatest CO_2 avoidance in which applications, framework conditions are being created that favour certain solutions and structurally disadvantage other, sometimes very effective options. In doing so, it is accepted that the ideologically preferred purely electric variant leads to higher CO_2 emissions in specific cases than the technologically equivalent Power-to-X option.

Unjustifiably strict requirements for power-to-X plants

This is particularly evident in the aforementioned requirements for power-to-X plants. To this day, this regulation continues to hamper the ramp-up of power-to-X

production and narrows the technological scope in favour of a politically driven all-electric strategy.

Global limits of the all-electric strategy

The approach of completely electrifying mobility may fail for a number of reasons, because complete electrification is not the goal, but only a means to an end. The goal must be the complete defossilisation of transport – in time to achieve the (overarching) national climate targets. This goal will not only be missed if we fail to electrify all transport, but also if this happens too late to meet the climate targets.

Failure here should not only be understood as total failure, but also, due to the urgency of climate protection, as achieving the goal too late – regardless of whether this is due to supply chain or raw material problems, a shortage of skilled workers, a lack of market acceptance or other reasons.

Switzerland's dual E strategy as a pioneer

Switzerland is therefore more pragmatic and is the only country in Europe to adopt a so-called dual E strategy in its legislation (Art. 11a CO2 Act): reducing emissions through both electrification and, complementing this, synfuels, as both are effective solutions that complement each other very well and can therefore reduce emissions more quickly than either approach alone. Instead of "either/or", Switzerland is focusing on "both/and".

Lack of independence in Swiss climate policy

Unfortunately, the situation is different when it comes to implementation. The Swiss authorities are strongly oriented towards the European environment when it comes to climate protection regulation. Instead of pursuing an independent, technology-neutral strategy decided by parliament, guidelines and models are often adopted from the EU.

8. Conclusion

Switzerland is ideally positioned to play an international pioneering role in the market ramp-up of Power-to-X. However, it is not only the legal framework that is crucial, but also the details of the regulations: these determine whether projects can be financed or whether investments will fail to materialise. Incorrectly set parameters and inconsistent enforcement rules can not only slow down the development of a PtX

industry, but also delay it by years or even decades – and thus also an important lever for achieving climate targets more quickly.

Power-to-X projects require regulatory stability and access to capital over periods of 15 to 20 years; short-term approvals and uncertain follow-up regulations are clearly at odds with this, as is a lack of technology neutrality. Instead of either/or, regulation should fully support both technologies, or at least not hinder them.

At the same time, targeted adjustments offer considerable leverage. Consistent, appropriate and technology-neutral requirements can significantly reduce the costs of Power-to-X and accelerate investment in the development of seasonal storage and a global production infrastructure.

Switzerland is thus facing a strategic decision: either it sticks with detailed EU regulations that inhibit investment, even though it does not have to, and thus repeats their misguided incentives – or it consistently uses Article 11a as a locational advantage and establishes a technology-neutral, investor-friendly Power-to-X regime with an international signal effect.