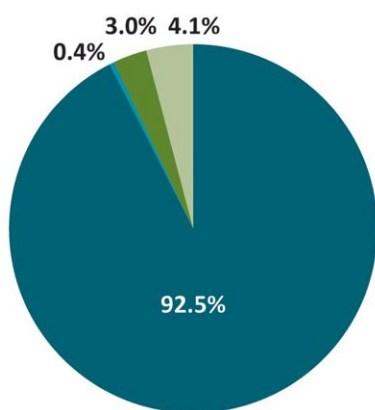


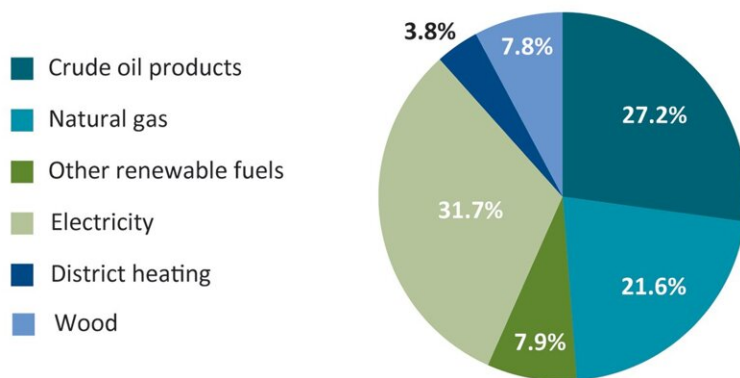
# From price shock to independence from fossil fuels

June 20 2022, by Florian Meyer

Energy carriers for transport



Energy carriers for households



Percent share of energy carriers covering Swiss transport and household energy demands in 2020 . Credit: Swiss Federal Office of Energy

Oil and gas prices are currently on the rise, raising questions about the security of Switzerland's energy supply. In a policy brief, researchers from the Energy Science Center at ETH Zurich have now shown what Switzerland can do to make its energy system independent of fossil fuels such as oil and natural gas.

Prices for oil and gas have risen sharply since Russia invaded Ukraine in February. This increase has also shown consumers in Switzerland how vulnerable a country's energy security can be if supply depends heavily

on imports of natural gas and other [fossil fuels](#). A relatively large proportion of Switzerland's energy is imported: according to figures from the Swiss Federal Office of Energy, Switzerland imported around half of its primary energy requirements via fossil fuels (oil, natural gas and coal) in 2020 alone. If imported [nuclear fuel](#) for [electricity production](#) in [nuclear power plants](#) is added, as much as 72% of the country's primary energy comes from abroad.

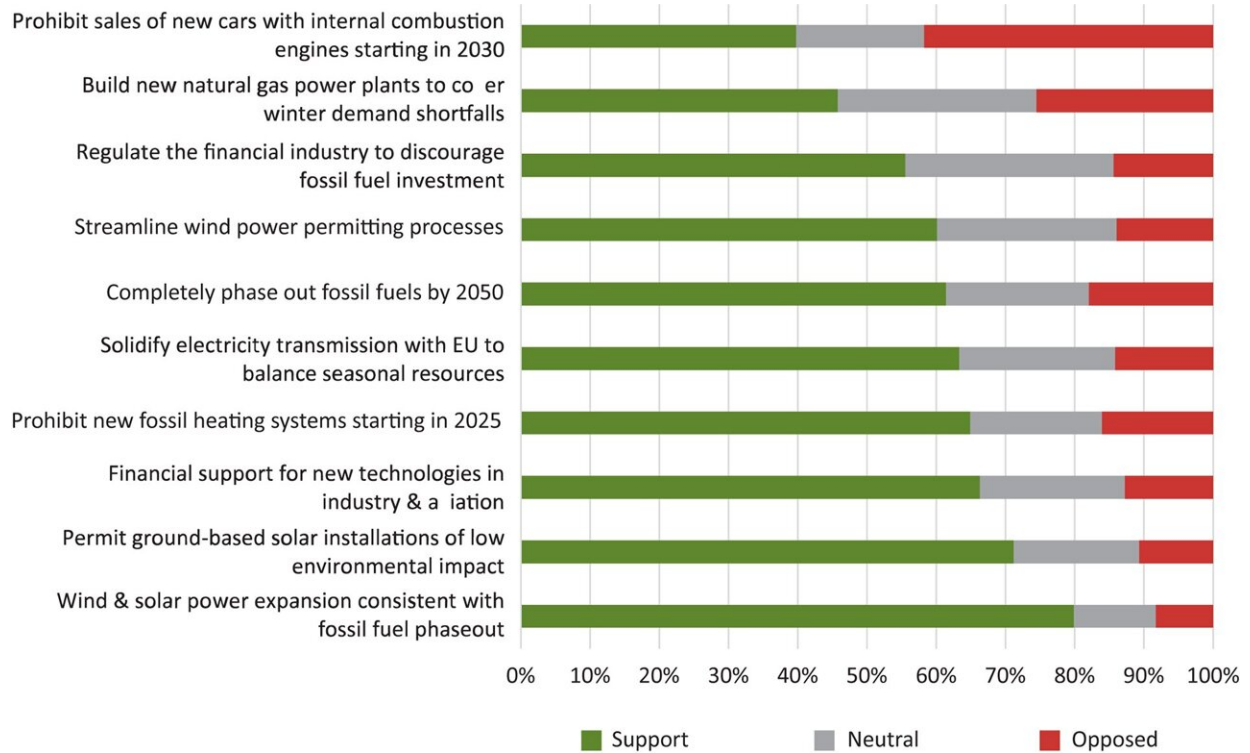
Should the energy-political conflict intensify or further conflicts emerge, this could end up threatening Switzerland's [energy supply](#). In light of current energy-political developments and with a view to the climate policy goal of net zero greenhouse gas (GHG) emissions by 2050, a logical strategy would be to drastically reduce dependence on foreign oil and gas imports. This is the conclusion reached by ETH energy researchers from the fields of mechanical engineering, electrical engineering and climate finance and policy in the policy brief "Steps to Fossil-Fuel Independence for Switzerland," published today.

## **The latest findings in condensed form**

The policy brief was written by six professors and five scientists involved in [energy research](#) at ETH, who formed an expert group to tackle key questions about security of supply in Switzerland. The position paper outlines the ways in which Switzerland could increase its independence from fossil fuels in the coming years, and the political steps needed to achieve a fossil-free [energy system](#) with net zero greenhouse gas emissions by 2050.

With the exception of one survey, the expert group did not conduct any new research, but rather summarized established scientific facts and findings—including available statistical data from the Swiss Federal Office of Energy (SFOE) and the International Energy Agency (IEA)—to outline the need for action in terms of both policy and

practice. The Security of Supply expert group will be followed by others in the future, and they will also address current issues from the energy sector.



Support for policy proposals. Credit: Patt & Steffen, 2022

### Exchange with Europe is key

In the current position paper, ETH researchers conclude that a Swiss energy system that is free of greenhouse gases by 2050 is both technically and economically feasible—and the scientific basis for this was developed by researchers at the Paul Scherrer Institute (PSI) and ETH Zurich. They point out, however, that the costs and benefits of energy supply can vary greatly depending on the energy policy priorities

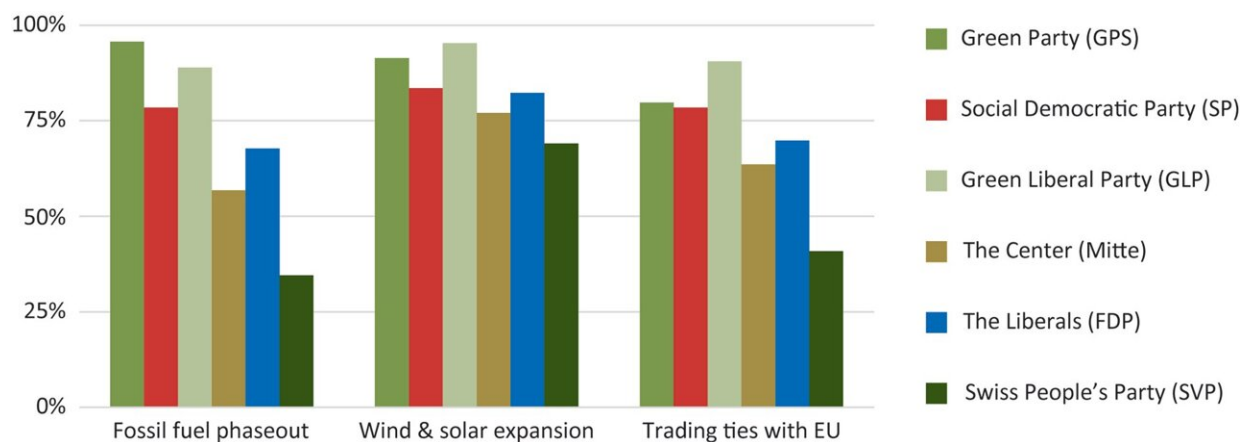
and measures in place.

One example is cooperation with neighboring countries: in the future, Switzerland will still not always be able to produce enough electricity to ensure self-sufficient coverage of its entire domestic demand. When it comes to ensuring secure domestic supply, it will be a question of Switzerland working more closely with the European system.

"An isolated solution for the Swiss energy system is less efficient and massively more expensive than exchange with neighboring countries," says Christian Schaffner, Executive Director of the ESC, who coordinated the expert group's work together with Kirsten Oswald.

## No silver bullet

Switzerland will achieve its greatest contribution to reducing energy demand and greenhouse gas emissions by electrifying transport and buildings, i.e. by phasing out fossil fuels such as petrol and kerosene and heating systems that run on oil or natural gas.



Proportion of respondents supporting three exemplary policies, according to

political party preferences. Credit: Patt & Steffen, 2022

In industry, phasing out oil and natural gas will be more difficult, and it will require alternative fuels such as synthetic gas and hydrogen. The idea is for natural gas to only be used in conjunction with new negative emission technologies (NETs) that can capture and store CO<sub>2</sub>. "A net-zero energy system will be based on a diverse combination of technical, policy, and social measures. There's no silver bullet in the form of a single technology," says Schaffner. "The biggest challenges are not necessarily technical or economic, but social: without society's commitment, these ambitions cannot be achieved."

## **Acceptance of fossil fuel phase-out**

It has already become apparent that the Swiss population's acceptance of the idea of phasing out oil and [natural gas](#) for heating residential buildings, or cars with combustion engines, has increased since the start of the war. This was revealed in a new representative survey conducted by ETH researchers Anthony Patt and Bjarne Steffen with 1,000 participants in April 2022 and incorporated into the position paper.

According to the survey, the Swiss support almost all political measures aimed at ending dependence on fossil fuels and promoting the use of renewable energies. The survey results also show broad support among the political parties for the expansion of domestic wind and solar energy as a substitute for fossil fuels.

The study is currently being reviewed and prepared for publication in a research journal. As a working paper, it is now publicly available together with the [policy brief](#) on the Energy Science Center website.

**More information:** Energy Science Center (2022). Steps to fossil-fuel independence for Switzerland. Policy brief of the expert group Security of Supply. [ethz.ch/content/dam/ethz/speci ... rch/publications/ETH%20Zurich%20ESC%20Policy%20Brief\\_Steps%20to%20fossil-fuel%20independence\\_20220617.pdf](https://ethz.ch/content/dam/ethz/speci...rch/publications/ETH%20Zurich%20ESC%20Policy%20Brief_Steps%20to%20fossil-fuel%20independence_20220617.pdf)

Patt, A., & Steffen, B. (2022). A historical turning point? Early evidence on how the Russia-Ukraine war changes public support for clean energy policies. Working paper of the survey: [ethz.ch/content/dam/ethz/speci ... ch/publications/Patt%20Steffen%202022%20-%20Working%20paper%20public%20acceptance.pdf](https://ethz.ch/content/dam/ethz/speci...ch/publications/Patt%20Steffen%202022%20-%20Working%20paper%20public%20acceptance.pdf)

Ramachandran Kannan et al, A net-zero Swiss energy system by 2050: Technological and policy options for the transition of the transportation sector, *Futures & Foresight Science* (2022). [DOI: 10.1002/FFO2.126](https://doi.org/10.1002/FFO2.126)

Florian Landis et al, Multi-model comparison of Swiss decarbonization scenarios, *Swiss Journal of Economics and Statistics* (2019). [DOI: 10.1186/s41937-019-0040-8](https://doi.org/10.1186/s41937-019-0040-8)

Provided by ETH Zurich

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