

Origin of primary energy resources for Swiss end energy consumption

[Niels Jungbluth](#) and Martin Ulrich, [ESU-services Ltd.](#), Schaffhausen, 10.3.2022

Online version: <https://www.linkedin.com/pulse/origin-primary-energy-resources-swiss-end-consumption-esu-services/>

The present situation with the Russian attack on the Ukraine leads to discussions about the origin of energy consumed in Switzerland. With the help of life cycle assessment, it is possible to track down the use of final energy (electricity and fuels) to the countries where the energy carriers were extracted. Here we evaluate the total final demand for fuels and electricity consumed within Switzerland according to the energy statistics for 2020. About 25% of Switzerland's primary energy demand is presently sourced from Russia.

Switzerland consumes about 747 PJ (peta-joule = 10^{15} Joule) of final energy (electricity and fuels). The primary energy demand for this is calculated to be 1210 PJ-eq and includes the losses of energy in the supply chain. The most relevant resources are crude oil: 380 PJ-eq, uranium with 350 PJ-eq, natural gas with 200 PJ-eq and hydropower with 100 PJ-eq.

The primary energy is mainly extracted in Russia which amounts to 25% or about 300 PJ-eq. Switzerland is dependent on Russia for the provision of energy from uranium: 130 PJ-eq, natural gas: 88 PJ-eq, and oil: 72 PJ-eq and coal. Thus, for a reduction of this dependency it is necessary to reduce the consumption of natural gas (e.g. for heating), fossil fuels for transports and heating, as well as electricity from nuclear power plants. Other important countries for the supply are Kazakhstan, Canada, United States and Norway, delivering each between 8-6% of the final demand.

About 15% of the primary energy comes directly from Switzerland. Nearly all of this comes from renewable resources like hydro power, solar energy, wind, and biomass. There is some potential to increase this supply e.g. by giving higher priority to install photovoltaics and wind power plants and thus become more independent from foreign supplies.

In another evaluation, we already addressed the question of [how, based on the current situation, dependence on Russian energy supplies can be reduced through consumer choices.](#)

It is self-explanatory that the implementation of the above measures would also contribute to Switzerland becoming generally less dependent on energy imports from abroad. It is also known from our previous studies that switching to domestic and renewable energy resources would contribute significantly to reducing the climate footprint and environmental impacts of Swiss consumption and production.

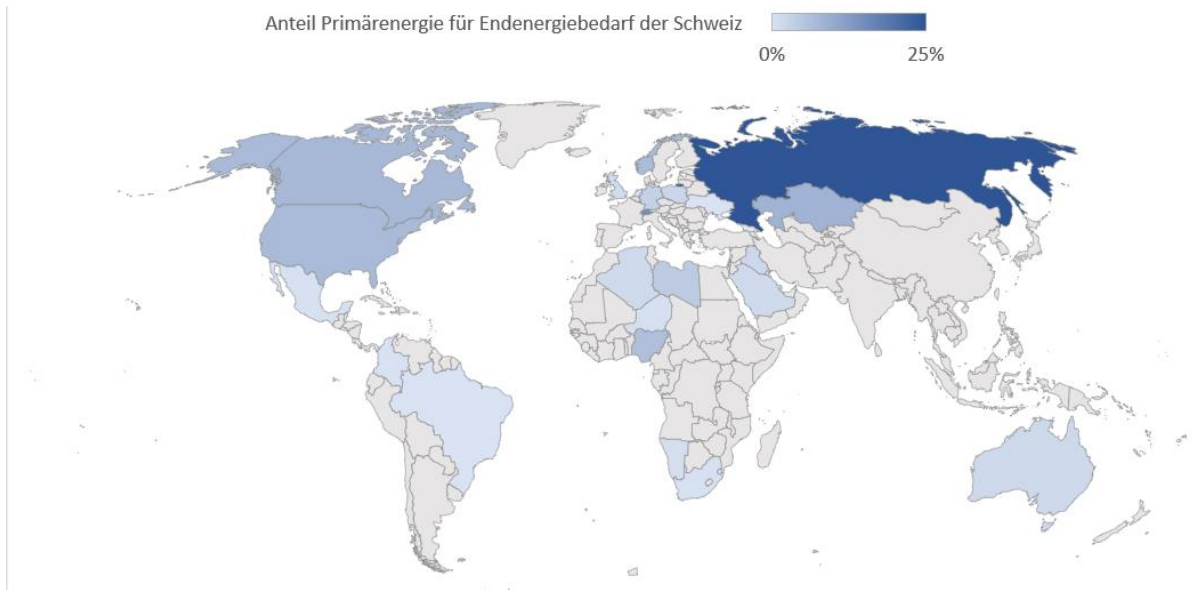


Figure 1 Share of different countries in the extraction of primary energy for the total final energy demand in Switzerland