

Pathways to reducing Switzerland's dependencies on gas and oil

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Reducing the dependencies of oil and gas has gained relevance for Switzerland to be efficient as well as sustainable. To overview the Swiss situation, statistics and the bachelor projects identifies alternatives to achieve the goal of reducing the dependencies. A System Dynamics simulation model illustrates what factors determine lowering the dependency and improve the country's degree of autarky.

Initial situation and objective

Switzerland needs to reduce its dependency on oil and gas to break free from fossil resources. Therefore, a switch to renewable energy and a reduction in energy consumption is needed to meet the energy demands of the country. With 78% of the total energy consumption related to non-renewable energy, Switzerland depends on imports of natural gas and fossil fuel due to the energy demand that is needed by a country as a country of high level of civil development status. According to the Federal office of energy of Switzerland, the dependency is even more severe because Switzerland lacks its own storage capacity for natural gas and daily imports are needed according to the daily needs of the industry and the population of the country.

The objective of this thesis is to identify the dependencies on oil and gas and principle pathways to reduce these dependencies within less than 1 year. Options will be looked at to see how these dependencies can be reduced. Reduction strategies like those of Germany are looked at and what possibilities exist to use them in Switzerland as well. To show the dependence to Switzerland a Stock and Flow model will show the degree of autarky regarding oil and gas with the influencing factors.

Research design

Journal articles and scientific papers provide knowledge as well as the federal office for energy of Switzerland as a basis. The findings from the research will provide an understanding of the initial situation of

dependence on Switzerland and provide information to alternatives and reducing strategies. This information also provided the foundation for the stock and flow model simulation model regarding the degree of autarky to oil and gas and the influencing factors.

Resulting Simulation Model

The degree of autarky is influenced by factors that increase the autarky of Switzerland by alternatives measures to reduce or replace the dependences such as a car free Sunday. But also factors that decrease the degree of autarky. This implies dependencies that are hard to decrease in a time frame of less than one year. Renewable energy sources such as photovoltaic production, water energy and wind energy are other positive factors. Another negative factor is the growing demand for energy by technology and Machinery used in the industry of the country. If the demand cannot be fulfilled through renewable energy sources fossil resources will be used to close the gap. This model as figure 1 shows help to see the relevance of managing the degree of autarky and which possible scenarios of improvement or decline in autarky can result.



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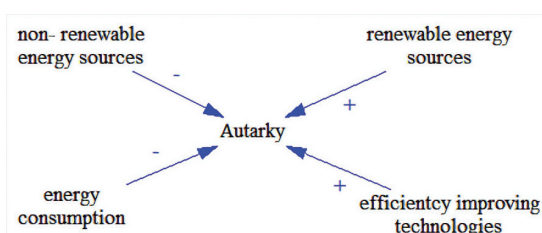


Figure 1: Influencing factors to autarky