



Sustainability tomorrow: Identifying challenges, analysing approaches and assessing future strategies

Video Transcript

Assessing Sustainability in Practice

[Prof. Dr. Frank Krysiak] In this discussion, we will apply the framework developed so far to the Swiss Energy Strategy. The Swiss Energy Strategy is based on the Swiss Energy Perspectives 2050+. You will find a relevant link below this video.

There are two questions we would like to discuss. First, to what extent do the Swiss Energy Perspectives contribute to sustainable development? And second, which aspects are missing?

We will start by checking whether the strategy is based on a system perspective that is sufficiently comprehensive. In other words, are the crucial elements of the nature sphere, the human sphere and the intersection of these spheres covered?

After that, we will look at the goals that underpin the Swiss Energy Perspectives. Do they overlap sufficiently with the idea of sustainable development? Are there blind spots – for instance, aspects that are highly relevant to sustainability, but which are not addressed at all?

[Prof. Dr. Patricia Holm] Let us start with the system perspective. The Swiss Energy Perspectives are based on numerical simulation models. These models contain a very sophisticated description of the technologies, the potential and the costs of these technologies. The models also calculate the environmental impact of the technologies in terms of greenhouse gas emissions and, to a lesser extent, land use.

This perspective is therefore highly detailed at the intersection of the nature and human spheres. In the natural sphere, there is a very thorough description of the greenhouse gas emissions that result from energy use. This makes it possible to describe and evaluate how a change in the energy system would contribute to mitigating climate change.

However, other environmental impacts are only addressed to a fairly limited extent in the Energy Perspectives. The potential of technologies is understood to be the amount of energy that they can deliver. It is calculated on the basis of what is known as «techno-ecological potential». This is a rather vague description of many other environmental aspects that would be important for sustainability.



This leads to our first conclusion: sustainability of the energy system means more than just mitigating climate change. This fact is missing to a surprising extent in the Swiss Energy Perspectives.

[Prof. Dr. Paul Burger] Let us now look at the other side of our framework. It becomes clear that the demand for energy services drives the development of the energy system to a considerable extent. This demand evolves in tandem with societal developments. For example, a move towards home office work and job sharing may reduce the demand for mobility services. However, this may lead to a different geographical distribution of electricity, a higher demand for housing, and therefore different requirements for heating.

In the Swiss Energy Perspectives, this aspect is only captured via the trends in demand for different types of energy, such as electricity, energy for mobility or space heating. These trends are exogenous; that is, they inform the analysis but are not part of the analysis. This implies that a changing technology base is thought to have no impact on these societal trends. However, there is substantial evidence that the social and the technological systems co-evolve.

This leads to our second conclusion: the societal system and societal developments are not captured in sufficient detail in the Swiss Energy Perspectives.

[Prof. Dr. Frank Krysiak] Finally, let us consider the objectives underpinning the Energy Perspectives. The Energy Perspectives are built by using a set of constraints, such as attaining net-zero greenhouse gas emissions in a specified year, and choosing among all possible developments the one that has the lowest total costs. It is thus based on mitigating climate change and minimising costs.

From a sustainability perspective, this is not enough. Mitigating climate change can be seen as a contribution towards intergenerational justice. However, the aspect of intragenerational justice is missing completely. Minimising costs can easily lead to a situation where some parts of the population bear a heavier burden than others. Furthermore, other important impacts such as biodiversity loss, habitat protection, and health and air quality in urban areas, are also missing.

This leads to our third conclusion: the Energy Perspectives have too narrow a set of objectives. They only aim for a development that contributes to selected aspects of sustainability, rather than encompassing a more thorough sustainable development of the energy system. As we do not know if this has negative side effects on other important sustainability considerations, this is not sufficient.

[Prof. Dr. Patricia Holm] We could go into more detail as well as into more aspects. However, the main points for assessing the sustainability of a strategy for an energy transformation have been made clear by this example.



When doing this kind of assessment, we have to use frameworks applicable to the context in question. In our case, it was our framework applied to the Swiss energy system. The framework should include both perspectives: a system perspective, which shows which components and developments are important; and a target perspective – in other words, where we want to go. By comparing these perspectives with the one underlying the strategy that we want to analyse, we determine whether there are any major gaps.

[Prof. Dr. Paul Burger] In addition, we could also look at the perspective of how the system should be transformed. How should a strategy be implemented? Is this through government intervention such as taxation or command-and-control policies? Is this via governance structures that involve key actors in the implementation process? Is it a mix of these two approaches? This is an important third dimension that we cannot cover in this course.

[Prof. Dr. Frank Krysiak] Finally, it should be said that almost any strategy will appear to be incomplete when compared to a sophisticated framework for sustainability assessment. The purpose is not to show that a strategy is bad, but to find the aspects where it should be improved. Sustainable development is an iterative process, and so is the development of a sustainability strategy.