

# Sustainable and Resilient Energy for Switzerland (SURE)

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# How **sustainable** is the future Swiss energy system, and how **resilient** is it to possible disruptive events?

### Four pathway scenarios

- Storyline: economy, society, technology, environment, policy dimensions
- It can be explorative or normative; “what-if” analyses

#### SPS1: Team Sprint Focus on Sustainability

World gradually implements green strategies  
High regional and energy market integration  
Social behavior and lifestyles supporting sustainability actions

#### SPS2: Mountain Hike Focus on Energy Security

World gravitates toward a multi-polar order  
Regional conflicts increase energy security concerns  
Social behaviour and lifestyles willing to “pay for more security”

#### SPS3: Single Trail Run Fragmented Regions

Regions implement climate policies at different speeds  
Moderate regional and energy market integration  
Social behaviour and lifestyles supporting local markets

#### SPS4: Walk & Talk Current Trends and Policies

World follows a path not markedly different from today  
Geopolitical situation as of today  
Social behaviour and lifestyles in favor of proven options and norms

### Five shock scenarios

- It occurs suddenly on a pathway and has time, location, duration, intensity
- It can be transient or disruptive

#### Financial shock

Sudden deterioration of exchange rates between Asia and Rest of the World  
Impacts commodities and techs costs at all economic sectors  
Increase the cost of imports 10-40% in Asian capital market

#### Heat wave

High temperatures and record low precipitation  
Increases electricity, stresses the grid, disrupts hydropower  
4-6 months of drought, 5-14 days within 2-3 weeks of heat wave

#### Cold spell

Sudden cold wave and dry fall  
Increases electricity and heat, disrupts energy & mobility infrastructure  
2-6 weeks of cold wave

#### Societal change

Sudden population growth in CH due to (climate) refugees  
10.4 million in 2035, high socioeconomic inequality  
60-80% of the refugees in CH live in energy & mobility poverty

#### Nuclear power re-introduction

A political decision around 2030s to re-introduce nuclear  
Variants: From not further pushing the phase-out of nuclear power to a strong and dynamic promotion of nuclear



### SURE GAME

- **Players need to ensure Swiss electricity supply from 2022 to 2050**
- Important elements
  - ❖ They can construct new plants or upgrade existing ones – or they can import (in winter)
  - ❖ They can implement policy measures
  - ❖ They experience (SURE) shocks to which they need to react
  - ❖ But all this involves costs, waiting times, maybe pollution, decreasing popular support



Try yourself and play the game during the break!

### SURE Case Studies

Similarities and divergences between the national and the sectoral/urban/regional levels.

**We apply our methods to real case studies, ensuring that our strategies are practical and effective in achieving both sustainability and resilience in the Swiss energy sector:**



#### Stadt Zurich

The case study at the URBAN AND SUB-URBAN SCALE with Zurich as a starting point adapts the concept of the sustainability and resilience of the energy system in order to additionally take into account aspects that could arise from the specificities of urban energy planning.

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#### Canton Ticino

The case study of CANTON TICINO adopts the methods and tools developed by the consortium and applies them in a regional context to assess and ensure the coherence between federal and regional sustainability and resilience solutions that meet the aspirations and expectations of local actors.

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#### The Transport sector and Energy Intensive Industries

The case study on sustainability and resilience of the TRANSPORT SECTOR AND ENERGY-INTENSIVE INDUSTRIES investigates the interdependence of the operator of the Swiss train system (SBB) and the Swiss energy system to assess specific impacts of the activities of large actors of the energy system on sustainability and resilience, as well as resilience and sustainability aspects related to process heat provision for industrial companies and areas.

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