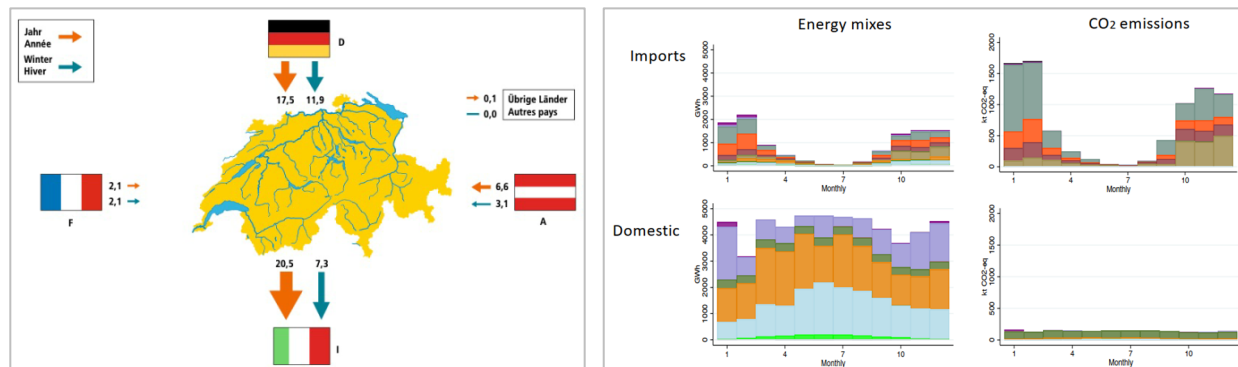


Solution 1.4/2: Hourly CO₂ data of the Swiss electricity mix



Issue / Challenge

Assessment at a high-temporal resolution of the CO₂ embedded in consumed electricity is needed to assess the environmental impacts of new electricity usages, such as heat pumps or battery electric vehicles. Such is particularly important for Switzerland, which is highly dependent on electricity imports from neighboring countries, especially in winter, some of which heavily rely on electricity generation from fossil fuels.

Description

Hourly data of the Swiss electricity mix is of paramount importance for assessing the actual environmental footprint of the heat pump market, which is expected to play a key role in decarbonization of the building stock, but also for other emerging usages such as electric mobility.

Development of annual hourly datasets regarding the Swiss electricity mix, taking into account imports and exports:

- Analysis of high-temporal electricity generation data of Switzerland and European countries
- Identification of imports, taking into account trade mechanisms (merit-order principle)
- Generation of hourly data sets regarding CO₂ emissions factor and renewable energy fraction

Type of solution:

- ☐ Service ☐ Tool ☒ Other: data sets
☒ Product ☐ Guidelines

Involved partners

- Research: UNIGE
- Implementation: -
- Others: datasets for use by multiple stakeholders (see below)

Implementation and Distribution

End users / Added value

The developed data sets are useful for assessing the environmental impacts of new electricity usages. As such they are made available to diverse end-users : electricity providers, public authorities in charge of assessing environmental footprints, industry, research institutes, building owners for assessing the carbon footprint of their buildings, electricity consumers in general.

Implementation

The datasets are being distributed by way of the dedicated platform www.horocarbon.ch, which is setup and maintained by UNIGE. Hourly data averaged over a pluriannual basis is distributed for free, while data for a specific year is sold. The platform further allows to perform online calculation of the environmental footprint of specific electricity usages (with standard profiles or user defined profiles).

The data has been used to assess the carbon footprint of electricity consumption in several buildings in Geneva. Additionally, there is significant interest from public institutions in using this data to evaluate the electricity consumption of their buildings (namely a pool of international organizations based in Geneva), for demonstration of a commitment to exemplarity.

Ownership and Distribution

Ownership:

☒ Single owner ☐ Multiple owner ☐ Other: ...

Type of distribution

☒ Free ☒ Monetarized (see implementation, further up)

Status of development

Achieved so far (May 2024)

- Methodological development and generation of pluriannual datasets (2017 onwards).
- Setting up of a web-based platform for information and distribution.
- Articles and interviews in several national and regional media outlets (in French, German, and Italian language), as well as in dedicated conferences and workshops (namely for the Association of Swiss Electricity Companies).
- Use of the data for assessing the environmental footprint of heat pumps in building retrofit (SP 2.1), and projects related to electrical mobility.
- Analysis / service for specific stakeholders (public authorities, industry, international public agencies based in Switzerland, ...)

To be done

- Generation of datasets for future temporal horizons (2030 and 2040), based on decarbonization pathways of EU countries (currently underway).
- Generation of real-time data and predictive short-term forecast (to be done beyond the Renowave project).

Risks / Mitigation

- The maintenance of data updates on annual emission factors could be compromised in future, if sufficient resources are not found to ensure the project's long-term viability.

Miscellaneous

This solution is in strong link / synergy with SP 2.1, where it is being used for assessing the environmental footprint of heat pumps in building retrofit.