

symphony

Ronquoz21 in Sion

Phased heating and cooling network planning for a city district growing to 2050

OIKEN · Amstein+Walthert · Symphony
Year: 2025



Photo: Gijis Jakobs / Pexels. Map: the Ronquoz21 site in the Symphony web app, with around 200 buildings in 11 sub-districts and the candidate network paths (dashed).

Introduction

Ronquoz21 is a new district in the heart of Sion, Valais. Over the next 30 years, renovations and new buildings will house about 5,000 residents and 6,000 workplaces, in a development that runs up to 2050.

In 2025, OIKEN, the local energy utility, worked with engineering firm Amstein+Walthert and Symphony to decide how to heat and cool the district. Instead of comparing two or three hand-picked variants, every option was optimised together across all sub-districts and development phases.

Key facts

- Site: new mixed-use city district, about 200 buildings
- Size: about 5,000 residents and 6,000 workplaces by 2050
- Scope: 9 supply scenarios × 11 sub-districts × 4 phases (2020–2050)
- System highlight: heating and cooling networks, CO₂ and water media, river and groundwater sources

What the study delivered

- Over 400 unique energy systems optimised, each with sizing, costing and hourly operation
- A like-for-like comparison of network types, heat sources and routing across every phase
- Interactive, web-hosted dashboards shared with all project stakeholders

Challenges faced

Options that all interact

Centralised or decentralised heat pumps; 60 °C or low-temperature networks with free cooling; CO₂ or water as the network medium; the Rhône, two to three groundwater extractions or the existing district heating network as heat source. A choice in one sub-district changes the economics of its neighbours.

A district that grows for 25 years

About 200 buildings come online in four phases (2020, 2030, 2040, 2050). A network sized for the 2030 buildings has to make sense for the 2050 ones, so the phases have to be planned together, not one after another.

Data at a scale beyond manual entry

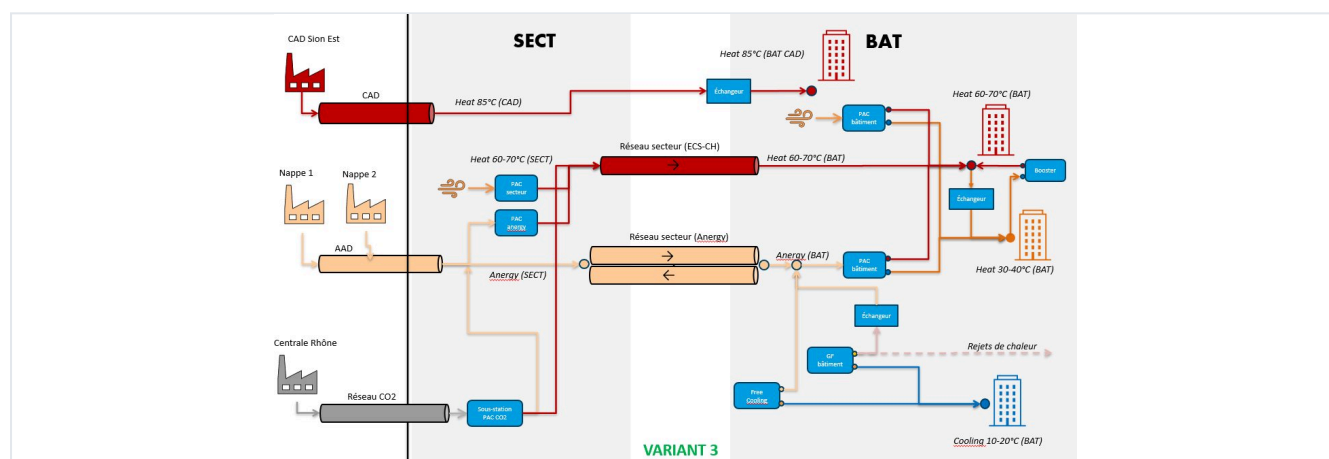
Hourly heating, hot-water and cooling demand for every building in every phase, plus hundreds of candidate network paths.

Who is OIKEN?

OIKEN is the local energy utility in Sion, Valais, and the client for the Ronquoz21 heating and cooling network.

Who are Amstein+Walthert?

Amstein+Walthert is a Swiss engineering firm with extensive experience in energy planning, from districts to entire cities, accompanying project owners from concept to execution. For Ronquoz21 they defined the nine supply scenarios.



Supply scenario 3, one of nine defined by Amstein+Walthert with OIKEN. Diagram: Amstein+Walthert.

Why Sympheny

Automated model building

With the Sympheny API and Python toolbox, data flowed straight from GIS maps and Excel tables into the optimisation platform, including additional data from partners such as HES-SO Valais-Wallis.

Everything optimised together

For each scenario, the MILP optimisation chose technologies and sizes, hourly operation, which network paths to build, the network type on each, and how the network grows over the four phases.

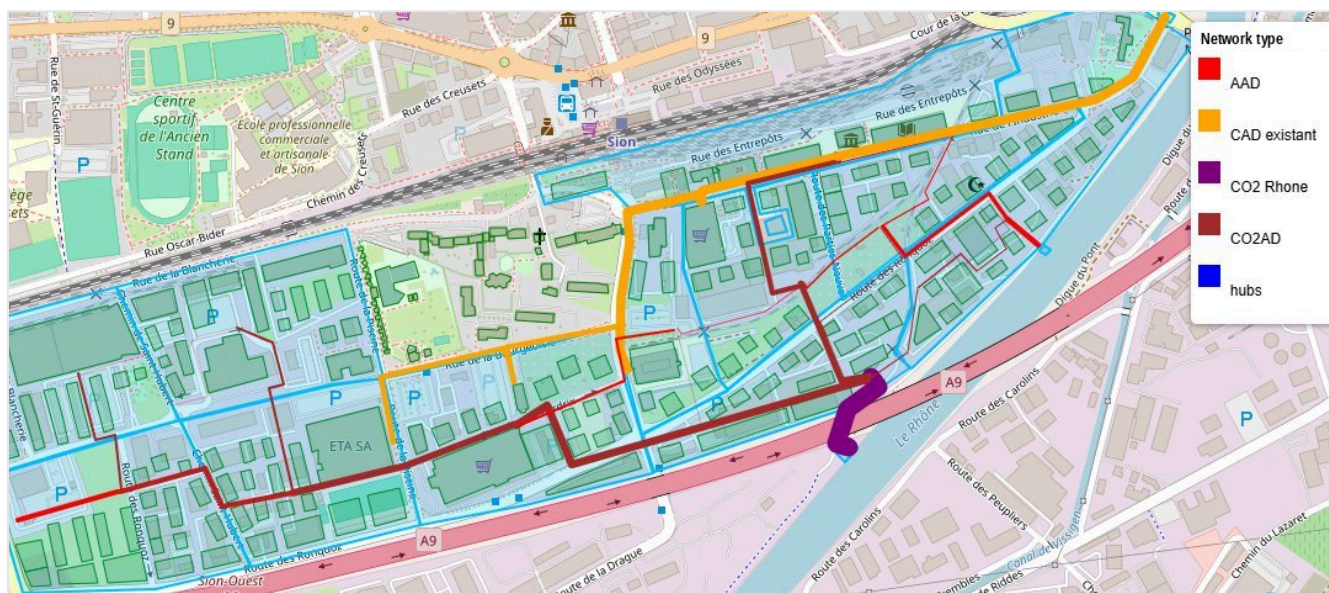
Results everyone can explore

Interactive, web-hosted dashboards let every stakeholder filter, zoom and validate results from a single, always-current source.

Results and impact

Once the pipeline from data to model to dashboard was in place, each new run took minutes, sometimes a couple of hours. Results were validated, input data refined and scenarios re-run. Seeing how quickly a new scenario could be set up, OIKEN chose to explore further options that had initially been left out.

In the end, more than 400 unique energy systems were optimised. Instead of defending a choice between two or three variants, OIKEN can show where each option sits on the cost-emissions trade-off and objectively rule out the ones that don't hold up.



Network layout for one scenario as shown in the results dashboard. Colour shows network type, line thickness shows capacity.

"We used to compare two or three scenarios but now, thanks to Sympheny, we can evaluate dozens of them based on a wide range of economic, environmental, and technical criteria. This allows us to identify the most relevant solutions and objectively rule out certain options, providing the client with a solid basis for decision-making."

Arthur Rinaldi, Project Manager, Amstein+Walthert

The future

Ronquoz21 is still at an early stage. The detailed results stay confidential while the project develops, and the model will be refined as the district takes shape.

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