

The Fenix energy concept delivers significant savings in addition to autonomy

Pilot projects of the Fenix Group confirm the correct orientation towards the combination of electric radiant heating, renewable energy sources and energy storage in family houses and industry.



Last year's annual press conference of the Fenix Group was marked by a number of important announcements. After the record results of 2022, the year 2023 could be characterized as a hard clash with reality, according to the words of holding company founder Cyril Svozil, yet the company continued or completed several key pilot projects. Already a number of partial data from their progress indicated good prospects for electric radiant heating, renewable energy and energy storage. A full-year balance sheet is now available, showing that the Fenix Energy Concept, with which the Fenix Group holding has long responded to current domestic and European legislation and market developments, is fully viable and delivers tangible savings and thus a return on investment without which it is impossible to survive in today's energy sector.



PROJECT CAMEB - family house in Omice by investor Mr. Dalibor Veverka



The control algorithm of the master control unit in a fully electrified family house controls all technologies. The private investor's house was completed in 2020 and is built to the nZEB standard. It is equipped with a rooftop PV system, an AERS HES battery storage system with a capacity of 41.1 kWh, ventilation with heat recovery and electric radiant heating from Fenix Trading. The electric heating is supplemented by a wood-burning radiant stove, these two sources heat the house reliably and very cost-effectively.

The project of the National Centre of Competence (Centre for Advanced Materials and Efficient Buildings CAMEB) was co-financed with the state support of the Technology Agency of the Czech Republic (TAČR). It was carried out by the University Centre for Energy Efficient Buildings UCEEB at the Czech Technical University in Prague, and in addition to Fenix Trading and AERS, belonging to the Fenix Group holding, TECO, S-Power and WAFE participated in it. A major turning point in the project's operation was the energy crisis that came to a head in late 2021, which influenced the decision to test the system for day trading on the electricity spot market.

The HES battery station from AERS with a capacity of 41.1 kWh has been actively using the daily electricity spot market in a family house in Omice for about two years. In this way, the price of electricity can currently be reduced to the pre-crisis level for most of the year, and then slightly higher during the heating season, but still tens of percent less than buying it directly.

This is evidenced by the results of the operation from January to December 2023. In 12 months, the owner of the family house consumed a total of 16 063 kWh (9 963 kWh excluding the consumption of the electric car). On the invoices, the owner paid (after deducting the amount for charging the electric car) for the year including fees and VAT the amount of 25 404 CZK, the average price per 1 kWh, achieved thanks to the PV, battery and smart control, was 2.50 CZK. The homeowner's electric car had an annual mileage of 35,000 km and if it were a conventional petrol car with a consumption of 6 l/100 km and we calculate a petrol price of CZK 38, the owner would pay CZK 80,000 per year for petrol. From the above, it follows that thanks to the Fenix Energy Concept with the above described configuration, he had the whole operation of the house for free and still saved 40 000 CZK. The return on investment for the PV and battery station is about 6-7 years at current prices.

In addition to the house in Omice, other family houses also demonstrate the significant savings achieved by purchasing electricity on the spot market. The fully electrified Kalvodova family house from 1932 is after a complete reconstruction and has a PV plant with an output of 10 kWp, a BESS HES battery station with a capacity of 41 kWh installed. Its owner has also been actively using the spot market since June 2023. In January he bought electricity at a fixed capped price, then from February to May at SPOT price (only buying without selling) and from June onwards he used the full SPOT trade according to the FENIX/UCEEB algorithm. And the result? The average price for electricity including distribution and VAT reached **2.38 CZK/kWh**.

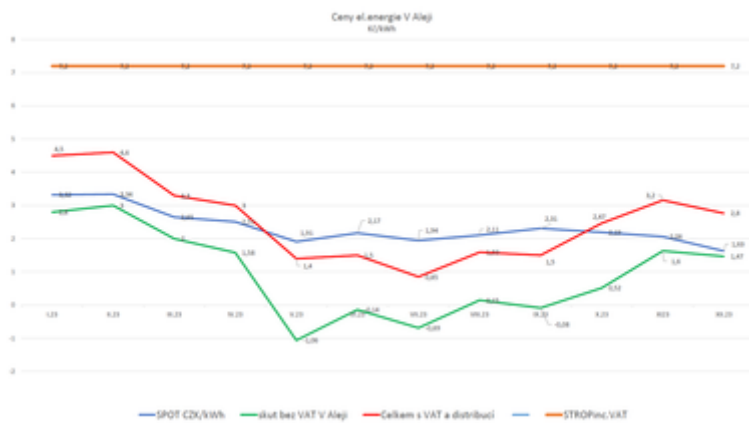


SPOT Kalvodova



Another family house in Jeseník also uses a combination of electric radiant heating, a PV plant with an output of 8.5 kWh and a BESS HES home battery station with a capacity of 41.1 kWh. Although this is a category C house (built in 2001) and includes a heated swimming pool from April to October, the owner also praises the savings achieved here. Even though this fully electrified house has the highest electricity consumption in the pilot projects of family houses, the average price including distribution and taxes was **2.9 CZK/kWh!**





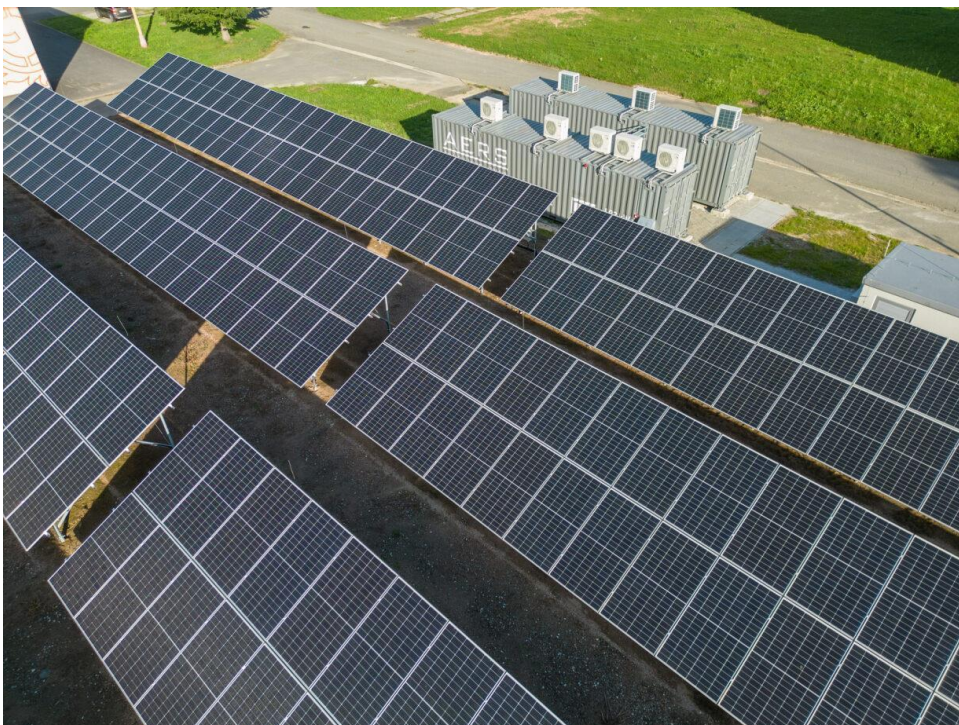
Multifunctional fully electrified house on Slezská Street in Jeseník and MES stations of Battery Energy Storage Systems (BESS) type



The multifunctional building has a heating area of 2,200 m² and an average annual consumption of 210 MWh, of which the building consumes 100 MWh for heating. The BESS MES battery station installed here at the end of last year, which is one of last year's AERS innovations, has a capacity of 578 kWh and an output of 150 kW. A PV

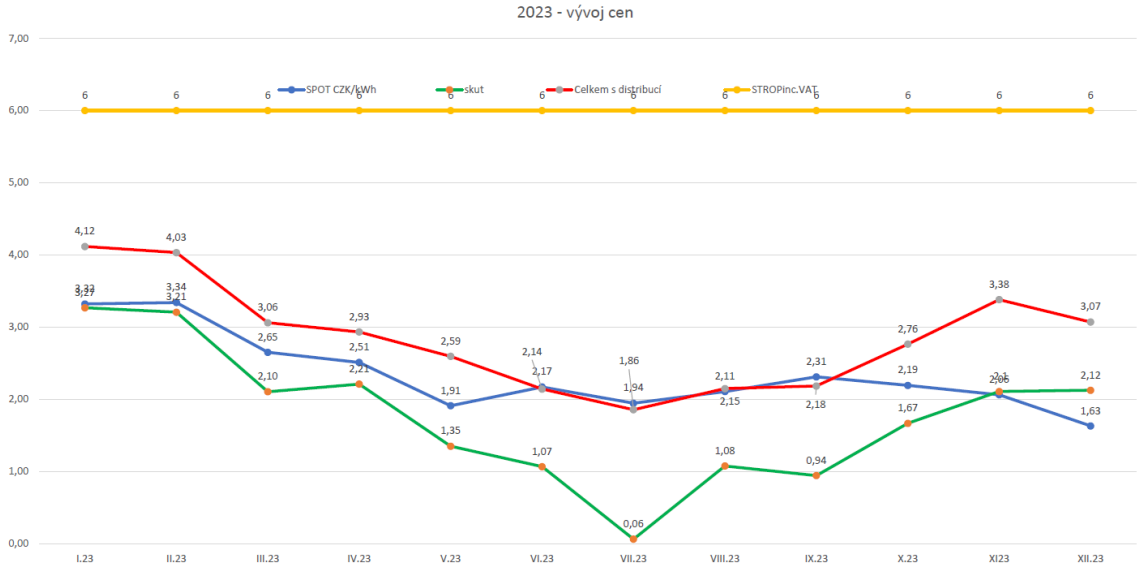
plant with a capacity of 32 kWp is installed on the roof. Here too, since the installation of the MES, electricity has been purchased on the daily spot market and thanks to the battery station, the savings for December 2023 (compared to last year's "capped" tariff) amount to over CZK 112,000. The electricity price for this month was **CZK 2.80 including VAT and charges.**

Fenix Energy Centre in Jeseník - PV plant 890 kWp, BESS 2.9 MWh



In the production plant of Fenix s.r.o. with an annual energy consumption of 2.4 GWh (full electrification), a photovoltaic power plant and a large-capacity battery storage BESS SAS were already in operation earlier, last year the company reinforced the PV power and expanded the battery capacity on its premises by installing two outdoor battery storage BESS SAS with a total capacity of 2,368 kWh, and at the same time completed a new wind power plant. AERS s.r.o., a company belonging to the Fenix Group holding, was the supplier of the complete turnkey solution for large-capacity battery storage.

Currently, the local photovoltaic and wind power plant has a capacity of 900 kWp. At the same time, one of the largest battery storage facilities in the Czech Republic with a capacity of 2.95 MWh and a capacity of 4x345 kW (1,380 kW) has been built in Jeseník. The storage facility serves the production plant to reduce reserved power (spreading consumption over 24 hours), manage quarter-hour peaks and as an effective protection and energy backup against outages that can cause significant damage to production. It also helps to manage and compensate for grid quality and to maximize the use of PV energy.



The active use of the spot market, which allows the company to significantly reduce its electricity costs thanks to the PV, the UCEEB/FENIX control algorithm and the system's plug and play containerized battery storage solution and the corresponding BMS (Battery Management System), delivered turnkey by AERS.

One year of operation of the new Fenix Energy Centre at the company's manufacturing plant in Jeseník proves that the combination of RES and smart large-capacity battery storage can bring significant energy cost reductions to small and medium-sized industrial companies through spot market energy purchases. In the case of the production plant in Jeseník, the savings for the period January to December 2023 (compared to the flat rate tariff) amounted to over CZK 6,600,000; the average price for electricity in 2023 was **CZK 3.10 including VAT and charges**. A partial constraint was the insufficient capacity of BESS SAS, which in its current state does not allow for optimised operation on non-working days. If the capacity were to be increased, the electricity price would decrease even further.