

PRESS RELEASE

Decarbonization of the production process for sea buckthorn products

Demo Case Overview

The **German pilot project, Demo Site #4**, aims to demonstrate how an **optimized, integrated energy system** powered by **renewable energy sources** can significantly reduce CO₂ emissions during the processing of sea buckthorn berries into juice, oil, peel and seeds. The production plant, located in the industrial park of Herzberg (Elster), incorporates:

- processing and dry facilities: a 400 m² area for processing sea buckthorn berries and a 300 m² area dedicated to pomace drying
- cold storage: capacity to store 300 tons of raw material at -18 °C and 70 tons of fresh juice at 4 °C
- additional infrastructure: 1500 m² of storage space for barrels and dried goods and 800 m² allocated for social rooms, analytics, energy supply, and workshops.

Key objectives include:



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- ✓ **Decarbonization of the production process:** Replacing fossil fuels with renewable energy sources and optimizing process water temperatures to minimize energy consumption.
- ✓ **Smart Energy Management:** Implementing intelligent storage technologies to efficiently manage hot water tanks, ensuring consistent delivery of the required pasteurization temperatures.

Challenges and Solutions

Sea buckthorn is renowned as a superfruit, packed with a wide array of nutrients including vitamins (A, C, D, E, B1, B2, B6, B12...), antioxidants and flavonoids. Its association with health and pure nature has led consumers to place increasing importance on sustainable and responsible production methods.

To ensure consistent quality and food safety, sea buckthorn berries must be stored frozen and the juice pasteurized. These processes are very energy-intensive, consuming 260 MWh per year for cooling and 285 MWh per year for hot water production.

At present, process heat is supplied as saturated low-pressure steam (120 °C at 3 bar) generated by a gas boiler. Electrical base load requirements are partially covered by a 55 kWp photovoltaic system.

Upon completion of planned conversion work, the process heat will instead be provided as hot water (up to 95 °C) using a heat pump, powered by a solar thermal system as the temperature source. Intelligent interconnection and optimized operation of multiple hot water storage tanks will ensure year-round coverage of heat requirements.

Precise temperature control is critical during key processes, such as defrosting the berries and pasteurizing of the juice, where constant monitoring and maintenance of specific temperatures are essential for product quality and safety.

This transformation underscores a commitment to sustainable practices, significantly reducing the environmental footprint of sea buckthorn production.

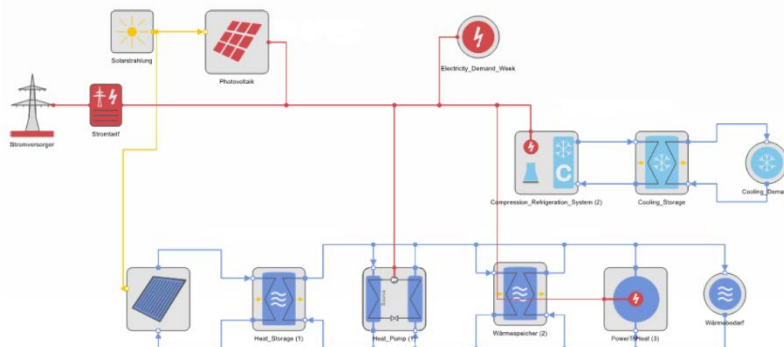


Figure 1. Simulation of the interconnection of the individual components

Implementation

Sanddorn GmbH Herzberg is located approx. 90 km south of Berlin and has 3000 m² of production and storage space. There are already 55 kWp of photovoltaics installed. The optimal site-specific decarbonization concept, 135 m² of solar thermal energy and the control system are already under construction.

The heat pump and buffer storage tank are scheduled for installation and setup by April 2025. Following this, extensive load testing will be conducted until April 2026, and the intelligent storage control system will undergo testing and adjustments during the same period.

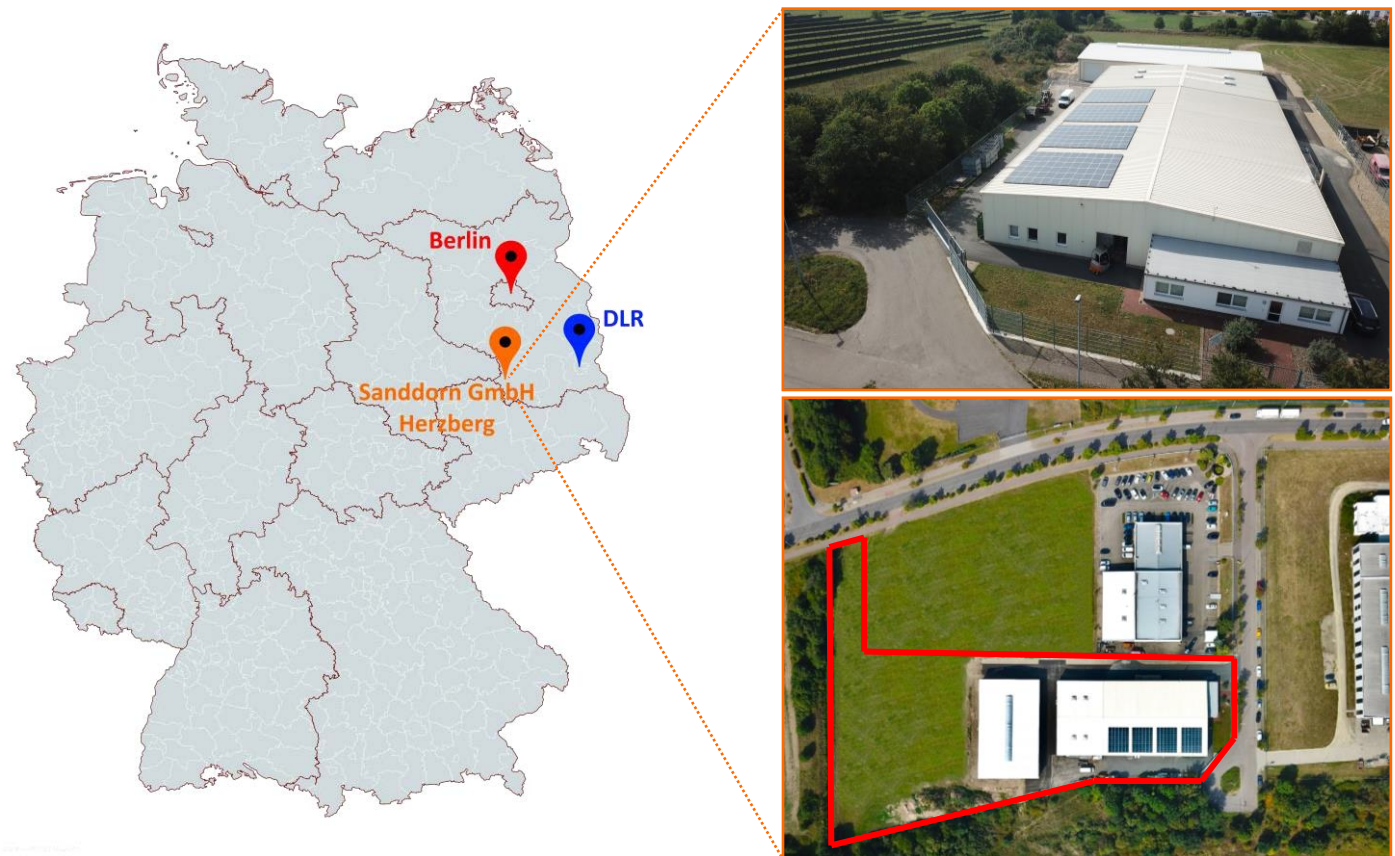


Figure 2. Location of Sanddorn GmbH Herzberg

Results and Impact

Switching to renewable energies will significantly reduce reliance on fossil fuels and cut a substantial portion of Sanddorn GmbH's annual CO₂ emissions. This transition enhances the company's efficiency and strengthens its market position by aligning with the growing consumer demand for sustainably produced goods.

Moreover, this technology is versatile and can be implemented in other industries, such as wineries, cideries, distilleries, breweries, and similar processes, promoting broader adoption of sustainable practices.



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Testimonials:

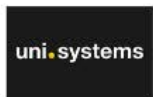


By switching to renewable energy, Sanddorn GmbH Herzberg remains competitive in the long term and can maintain its high level of quality. In addition, the technology can be used throughout the industry to reduce CO₂ emissions and energy costs,” says Martin Brylka, COO of Sanddorn GmbH Herzberg.

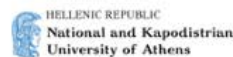
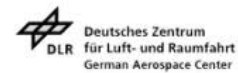
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