

# Case Studies

Optimisation of cogenerators through AI algorithms

## PROBLEM

Many prosumer companies struggle to manage energy production, consumption and storage in a coordinated manner: the variability of renewables, the dynamism of market prices and the lack of integrated control tools can lead to waste, inefficiencies and higher operating costs.

# APPLICAZIONI DI E-BOOST PER PROSUMER

## Module: Prosumer System Optimisation

E-BOOST empowers prosumers to intelligently balance energy generation, storage, and consumption.

By coordinating on-site renewable sources with market signals and operational schedules, it optimises self-consumption, minimises costs, and enhances sustainability.

The system enables dynamic decision-making to fully leverage distributed energy resources.

**RENEWABLE POWER GENERATION INTEGRATION:** Integrates on-site renewable energy sources such as PV, CHP, and turbines with real-time market data to optimise energy flows. Maximises self-consumption, minimises grid dependency, and leverages the lowest-cost or lowest-emission energy available.

**CONSUMPTION SCHEDULING:** Aligns energy demand with production and market conditions through intelligent scheduling of authorised assets. Supports controllable generation units and interruptible loads to optimise dispatch, reduce costs, and increase operational flexibility.

**Fanin S.p.A.**





## CUSTOMER

Fanin, a manufacturer of animal feed, operates energy-intensive plants powered by gas and vegetable oil cogenerators. E-BOOST has been implemented at this site to monitor and optimise energy processes.



## PROBLEM

The analysis highlighted process anomalies due to human operational errors, such as failure to activate the heat recovery pump connected to the cogenerator after the plant was started up, which resulted in significant energy waste and a reduction in the overall efficiency of the system.



## OBJECTIVE

Optimisation of cogenerator operation and advanced monitoring with predictive maintenance, in order to increase energy efficiency, reduce consumption and prevent operational failures.

# SOLUTIONS IMPLEMENTED & RESULTS ACHIEVED

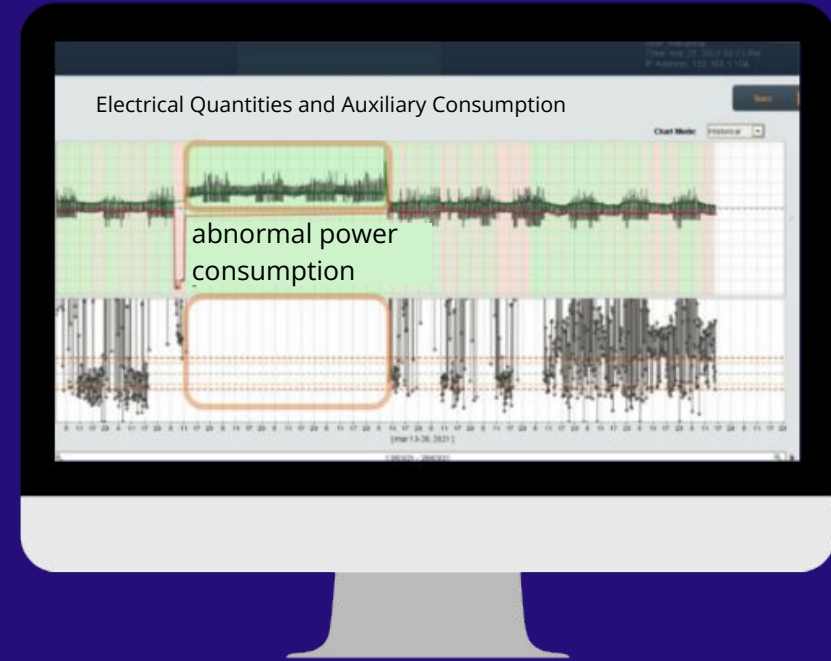
E-BOOST defined the **optimal operating power** and **network strategies** in real time, intelligently managing energy use and sales on the market.

Operational anomalies and errors were detected by the self-consumption algorithm, which sent immediate alerts and enabled **preventive maintenance** interventions in real time. This aspect is particularly relevant for vegetable oil-powered diesel engines, which have specific critical issues compared to diesel fuel, especially on injectors, with the risk of seizure and costly breakdowns.

E-BOOST was able to **predict injector malfunction** up to 17 hours in advance, allowing for timely corrective maintenance and avoiding failure.

## SAVINGS:

**11%** Approximately €98,000/year



*Real-time detection of abnormal consumption via the E-BOOST dashboard*

**Arco Srl**





## CUSTOMER

Arco S.r.l. operates in the cataphoresis and industrial painting sector, using energy-intensive processes that require efficient management of both thermal and electrical energy. The plant is equipped with a gas cogenerator and a photovoltaic system, combining internal production and renewable sources to support production cycles.



## PROBLEM

After the installation of the photovoltaic system, the cogenerator (CHP) showed high, unbalanced thermal consumption demand and lower-than-expected profitability, highlighting the need to optimise the operation and integration of the various energy systems.



## OBJECTIVE

Optimise regulation and implement predictive maintenance, rationalising electricity consumption, eliminating waste during weekends and reducing consumption peaks to improve efficiency, reliability and overall management of the system.

# SOLUTIONS IMPLEMENTED & RESULTS ACHIEVED

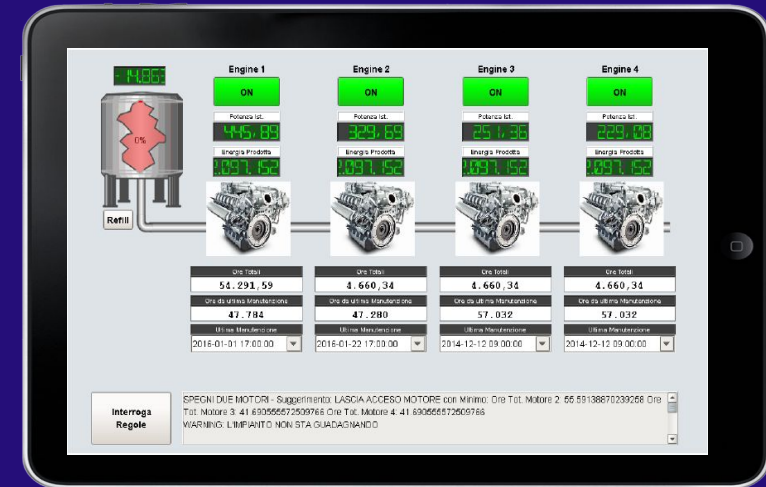
E-BOOST identified the **optimal operating point** for the cogenerator and boilers, thereby reducing energy consumption and increasing productivity.

During the day, the CHP was adjusted in real time to adapt to electricity and heat demand, using consumption data, energy prices and weather forecasts.

At the same time, the cogenerator maintenance programme was optimised from an economic point of view, and the efficiency of the heat recovery units was improved thanks to the early detection of cleaning requirements and signs of wear.

## SAVINGS:

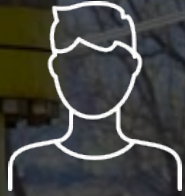
**20%** Approximately €95.000/year



Real-time monitoring and optimisation of the cogeneration system and boilers via E-BOOST

Italgas S.p.A.





## CUSTOMER

Italgas S.p.A. is Italy's leading gas distribution operator (and one of Europe's largest). The central gas decompression management system (from 16 to 6 bar) has an installed electrical power of 1 MW, while the cogeneration plant (CHP) has two units of 465 kW electrical / 500 kW thermal each, and the boilers have 1,000 kW thermal.



## PROBLEM

*Thermal tracking* operation proved inefficient and unprofitable; furthermore, the system suffered from frequent failures of the turboexpander speed reducer, compromising reliability and operational continuity.



## OBJECTIVE

Adjust and optimise the system to improve operational efficiency.

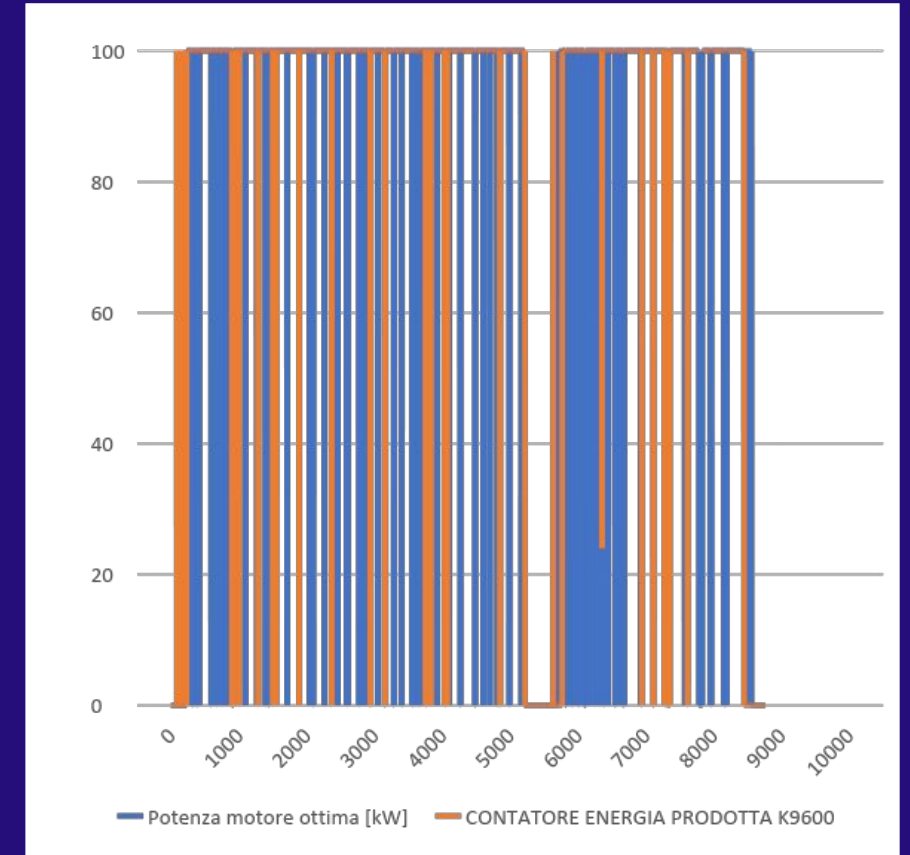
# SOLUTIONS IMPLEMENTED & RESULTS ACHIEVED

E-BOOST identified the **optimal operating point** for the boiler cogenerator and turboexpander, reducing energy consumption and increasing productivity.

Throughout the day, the CHP was adjusted in real time to adapt to electricity and heat demand, using consumption data, energy prices and weather forecasts.

## SAVINGS:

# 15%



*Comparison between the optimal power of the cogenerator and the energy actually produced over time, highlighting operational variability and the advantage of real-time regulation.*

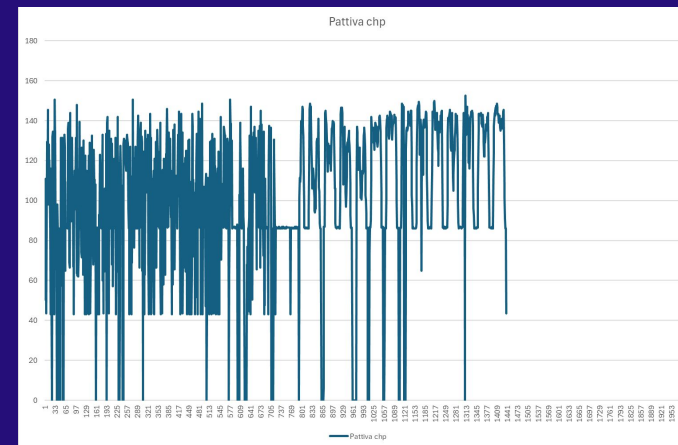
# COMPARATIVE ANALYSIS BETWEEN HISTORICAL DATA AND OPTIMISED MANAGEMENT

The REMI Cabin in Riva near Chieri was used as a case study to verify the effectiveness of the optimisation developed for Italgas. The plant, dedicated to gas decompression and energy production, allowed the regulation and monitoring logic of E-BOOST to be tested in the field.

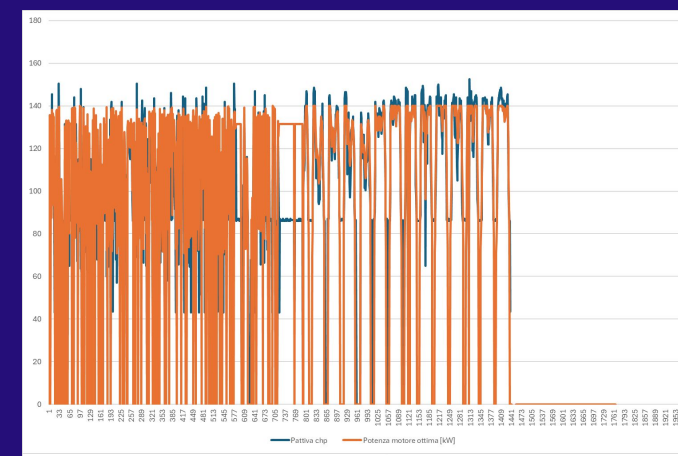
A comparative analysis of historical data and optimised management shows a clear improvement in system performance, highlighting significant margins in energy management and economic profitability.

## EARNINGS:

**31%** €2.230/month



Historical earnings in one month of operation: €7,302



Optimised management profit in one month of operation: €9,532



# Discover more about Prosumer Systems

TALK TO OUR EXPERTS

Or [visit our website](#)