

MICROGRID SOLUTIONS

Sustainable, resilient and
economical power

ACEF 2023 - Digital Technology as a
Driver of Decarbonization

June 14th 2023

JENBACHER
INNIO



AGENDA

- A changing energy landscape
- What are Microgrids?
- The INNIO Approach
- Your benefits
- INNIO 360 Energy Lab Case Study



YOUR CHALLENGE

A changing energy landscape

As the world embraces a future toward net zero the way we provide and consume energy is changing—the energy transformation faces 4 trends:

Decentralization

Smaller-scale power plants for communities and industries on the rise

Decarbonization

Ambitious climate goals lead to acceleration of renewable
Installations with greater blackout risks that need a balance

Digitalization

Demand for data centers and cloud storage grows and leads to need for more reliable power and resilient mission-critical infrastructure

Electrification

As access to energy improves globally, electrical energy demand and associated costs continue to rise



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INDUSTRY TRENDS

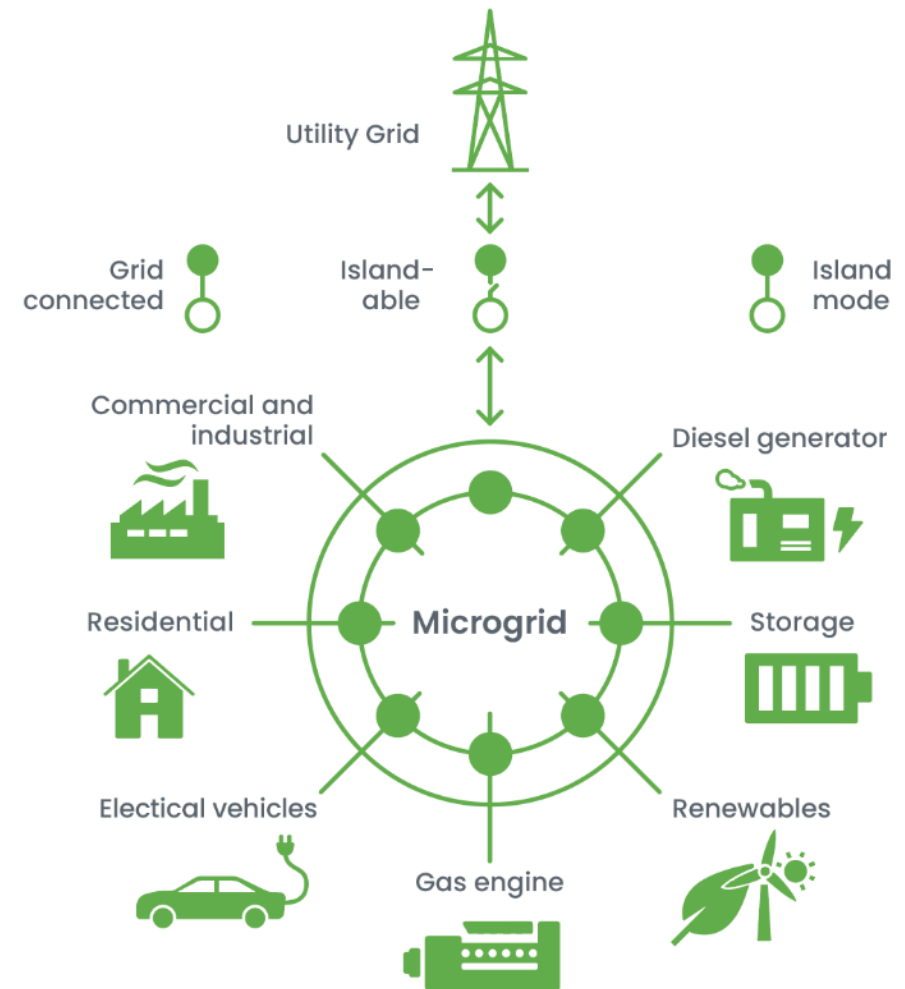
The microgrid: Providing resilient, economical power

As the need for secure, resilient and greener energy solutions increases, more and more businesses and communities are recognizing the economical benefits of distributed energy solutions.

What is a microgrid?

- Small scale power generation and distribution systems, including various Distributed Energy Resources (DER), loads and storage systems
- Can operate isolated or connected to main grid
- Typical size between 0.1 and 10 MW
- Focused on resilience and sustainable alternatives to the public grid

In microgrids gas-powered energy systems continuously replace diesel gensets where gas is available due to their superior fuel efficiency and lower carbon footprint.



AGENDA

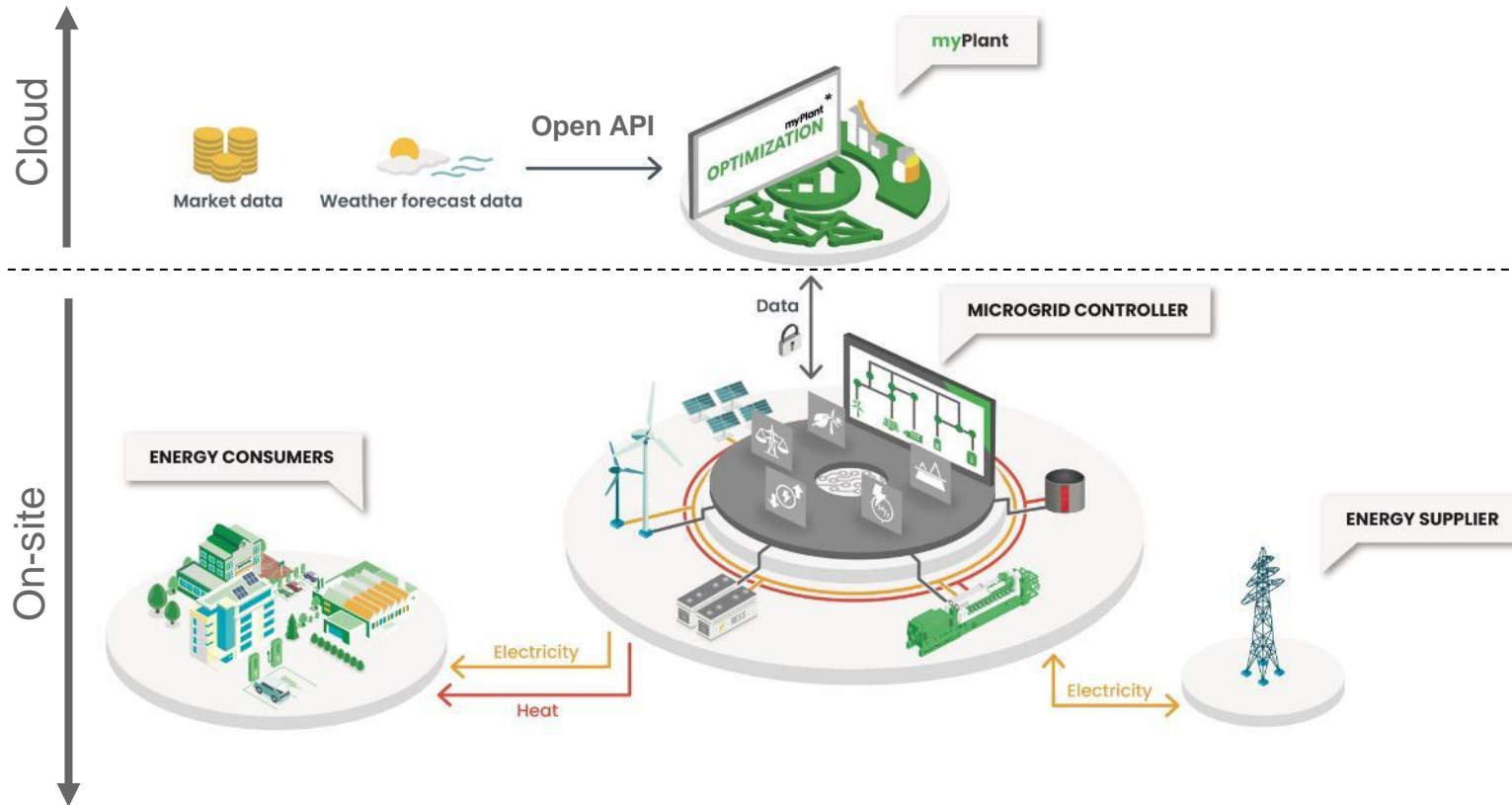
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THE INNIO APPROACH

Controls and digital solutions for microgrids

The microgrid controller and myPlant Optimization ecosystem



myPlant Optimization

- Artificial Intelligence (AI)–based energy management solution
- Precisely understands a plant's operational requirements
- Improves operational efficiency and overall balance sheet

Microgrid controller

- Acting as the brain of the microgrid
- Optimized for our Jenbacher energy solutions
- Integrating a wide selection of distributed energy resources such as renewables and storage devices
- Maintaining frequency and voltage in island mode for maximum resilience
- Black start capable in case of outage

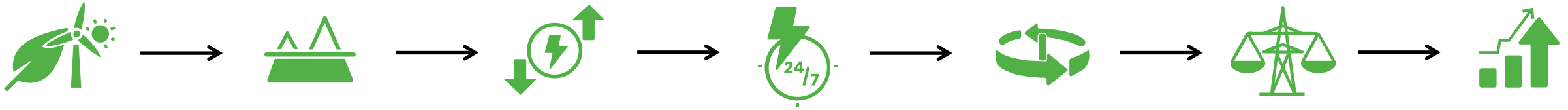
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YOUR BENEFITS

Microgrid advantages



Renewable integration

With smart management of dispatchable DERs, such as engines and volatile DERs like PV and wind, microgrids can employ a wide range of renewable energy resources without compromising resilience

Peak shaving

Combined with a BESS, the microgrid can reduce peak loads by discharging the battery when demand is high and recharging when demand is low. Demand charges can be reduced. Peak shaving also enables deferral of grid infrastructure investments

Energy arbitrage

When the grid is connected, real-time price arbitrage can be an important revenue stream to improve economics and increase return on investment for the microgrid

Power reliability/islanding

The microgrid can disconnect from the grid in case of a grid event. While islanded, DER operation is optimized for resilience. Seamlessly synchronizing back

Spinning reserve

Stable island mode operation through dynamic spinning reserve management. Battery energy storage systems further increase fuel efficiency and reduce the CO₂ footprint

Ancillary services

Microgrid supporting transmission grid by facilitating demand response programs as well as providing reactive power, frequency, and voltage control

Optimized self-consumption

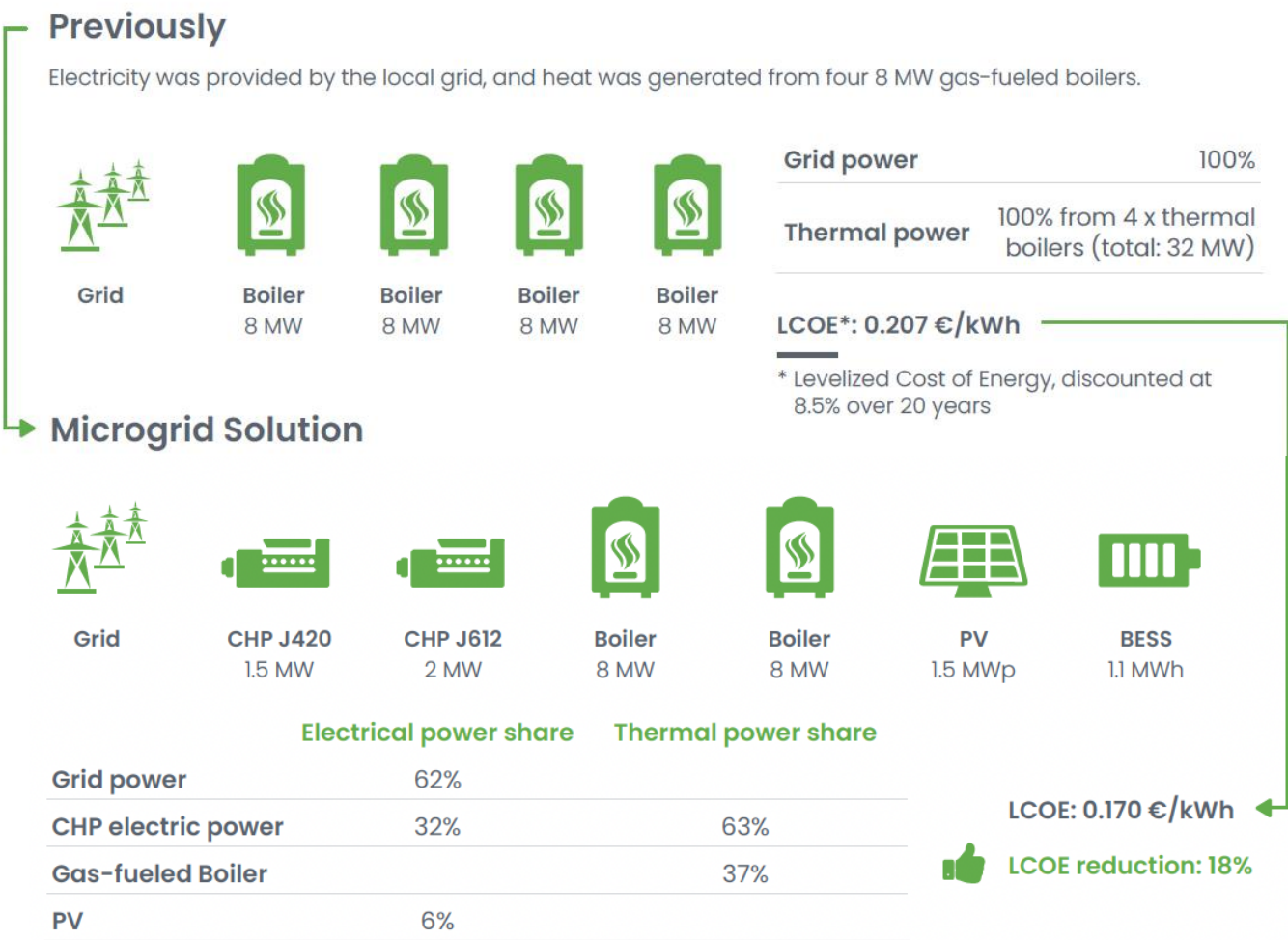
Reduces energy costs when feed-in tariffs are low. Surplus energy from renewables can be stored and used when needed

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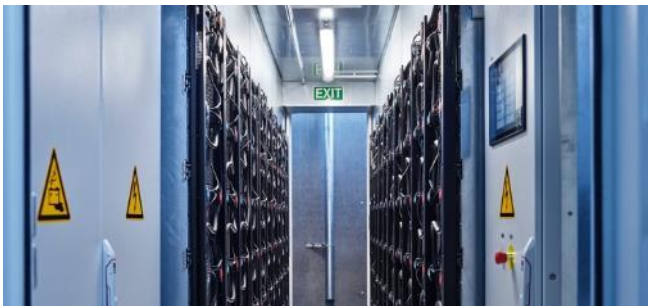
INCREASING RESILIENCE AND REDUCING COSTS with a microgrid



Photovoltaic Panels



Jenbacher CHP Systems

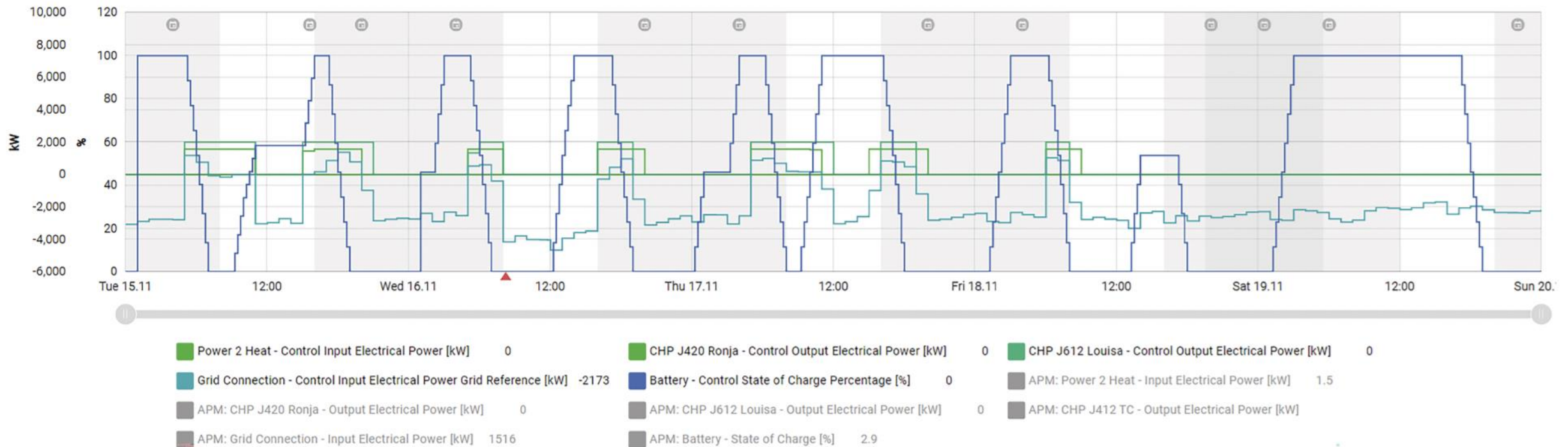


BESS

THE INNIO SOLUTION

Features

Operation plan of assets such as CHPs, battery, Power-to-Heat as well as grid connection optimization



INNIO is a leading energy solution and service provider that empowers industries and communities to make sustainable energy work today. With our product brands Jenbacher and Waukesha and our digital platform myPlant, we offer innovative solutions for the power generation and compression segments that help industries and communities generate and manage energy sustainably while navigating the fast-changing landscape of traditional and green energy sources. INNIO is individual in scope, but global in scale. With our flexible, scalable, and resilient energy solutions and services, we enable our customers to manage the energy transition along the energy value chain wherever they are in their transition journey.

INNIO is headquartered in Jenbach (Austria), with other primary operations in Waukesha (Wisconsin, U.S.) and Welland (Ontario, Canada). A team of more than 4,000 experts provides life-cycle support to the more than 55,000 delivered engines globally through a service network in more than 100 countries.

INNIO's improved ESG Risk Rating again secures the number one position across more than 500 companies globally in the machinery industry assessed by Sustainalytics.

For more information, visit the INNIO website at www.innio.com.

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In general, "Ready for H₂" Jenbacher units can be converted to operate on up to 100% hydrogen in the future. Details on the cost and timeline for a future conversion may vary and need to be clarified individually.

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ENERGY SOLUTIONS.
EVERYWHERE, EVERY TIME.



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