The benefits of the EnerTwin

The EnerTwin has many benefits:

- Affordable. The EnerTwin is less expensive than other micro CHP systems because it is based on technology and components used in the automotive industry.
- Fast ROI. Return on investment is achieved within three to six years, and sooner in the case grants are applicable.
- Low service costs. There is little wear and tear because a micro-turbine has only one moving part. The servicing frequency is once a year or after 5,000 hours of operation.
- Remote servicing. Technicians can read data from the EnerTwin remotely, making servicing more efficient and unnecessary call-out charges avoided.
- Silent. The micro-turbine does not vibrate. The closed housing allows little noise emissions. The EnerTwin has a noise level of 55 dB(A).
- Low weight. In contrast to other micro-CHP systems, the EnerTwin is very low weight. The installation does not require any structural changes to the building.
- Multi-fuel. The EnerTwin is developed to run on natural gas. Versions that run on domestic fuel oil, LPG and biogas are in development.
- Independent of your energy utility. You will generate most of your power yourself.
- Significant savings in energy costs. Depending on the number of hours of operation, you could save up to 25% a year on your energy bill.
- Sustainable. The decentral generation of electricity combined with clean combustion reduces CO2 and NOx emissions by 3 to 6 tons a year.
- Can be installed as a standalone system or in a cascade arrangement. The EnerTwin can be installed alongside the existing conventional heating boilers. It is not required to renovate your whole heating system.

R&D for a cleaner climate

Since early 2013, the Institute of Combustion Technology of the German Aerospace Center DLR (Deutsches Zentrum für Luft-und Raumfahrt) has used the EnerTwin in several of its research and development programs. Initial projects focused on the development of an ultra clean combustion process for the EnerTwin. More recently, MTT, DLR and several other partners have started a 4-year project for the development of a hybrid power plant which is capable of producing around 50 - 150 kW of electricity. Within such power plant, the EnerTwin will be combined with a high-temperature fuel cell (SOFC). The combination of a micro turbine and SOFC promises a very high electric efficiency which is expected to go up to 65-70%. Such high levels of conversion efficiencies are unmatched for small-scale electricity generation.

Proven technology

CHP is designed to generate heat and power where both are needed. A micro CHP system is a small-scale combined heat and power generator.

The EnerTwin has a unique way of generating heat and power. The core of the EnerTwin is a recuperated micro-turbine. A micro-turbine is a very small gas turbine. Gas turbines have been proven their worthiness since the 1950s in aviation, power stations and industry and are considered to be very reliable. EnerTwin’s micro-turbine has been developed based on the turbocharger technology used in the automotive industry. Therefore, the micro-turbines is very robust and requires little maintenance. Unique to the EnerTwin micro-turbine is MTT’s integrated generator and turbine design. The micro-turbine does not vibrate, is silent and has a long service life. MTT’s micro-turbine technology is protected by several patents.

MTT

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www.enertwin.com

The EnerTwin is available through selected companies.
The EnerTwin is a micro-CHP system (Combined Heat and Power) where a boiler and a small gas engine are combined in a single robust and durable device. The EnerTwin has been developed by MTT (Micro Turbine Technology BV). The core of the EnerTwin is a micro gas turbine that drives a generator. The micro turbine delivers 2.2 kW electrical power and 15 kW thermal power for heating and the production of hot tap water.

**Environmental protection**

The high fuel savings of a micro-CHP system compared to large power plants are beneficial for the environment. The main advantage of micro-CHP is that the energy available in the fuel is almost fully utilized. This stands in contrast to conventional power plants which have an average efficiency of only 45%—where substantial amounts of heat are lost into the atmosphere or to cooling water. Moreover, micro-CHP saves transmission and distribution losses of electricity from power stations to end-users.

The micro-turbine’s fuel efficiency combined with its clean combustion technology considerably reduces CO2 and NOx emissions. For each EnerTwin installed, approximately 2 to 6 tons CO2 emissions are avoided annually compared with electricity produced in conventional power plants. The EnerTwin can also be used in combination with photovoltaic solar panels to achieve even greater savings. In such combination, the photovoltaic solar panels produce power round the clock, while the EnerTwin generates electricity during the day, and during the night. The EnerTwin is already fully prepared for the use in smart grids.

**Higher cost savings due to lower maintenance costs**

The generation of electricity as a byproduct of heat production allows the evader to achieve significant energy cost savings. These savings can average up to 25% of the annual energy bill. These cost savings are achieved by low cost of self-produced electricity compared to the electricity bought from your power company, while the produced heat is fully used in the building.

However, there is a substantial risk. If maintenance costs are too high, the advantage of energy cost savings is largely consumed by the higher maintenance cost, so can be seen in the graph below.

**Examples of applications:**

- Small and medium-sized businesses
- Industries with relatively small steady heat demands
- Workshops
- Leisure residential homes
- Houses with a swimming pool and/or fitness studios
- Schools, sports schools, gyms and fitness studios
- Commercial buildings
- Retail outlets
- Hotels and restaurants
- Grocers
- Health care centres
- Elderly homes
- Government buildings such as town halls, post offices, fire stations, police stations, libraries.

**Examples of applications:**

- Government buildings such as town halls, post offices, fire stations, police stations, libraries.
- Elderly homes
- Stores
- Petrol stations
- Schools, sport schools, gyms and fitness studios
- Houses with a swimming pool and/or fitness studios
- Schools, sport schools, gyms and fitness studios
- Commercial buildings
- Retail outlets
- Hotels and restaurants
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"I will have a short payback time on my investment."

"With the EnerTwin, I can offer my customers added value."
The EnerTwin is a micro-CHP system that uses a micro turbine. Micro turbines offer great advantages in reliability, life and robustness and are well suited for many micro-CHP applications, ranging from larger private companies and institutions to households. The micro turbine's fuel efficiency combined with its clean combustion technology considerably reduces CO₂ and NOₓ emissions. This means that the energy cost savings of the EnerTwin is substantial higher than the savings that can be achieved by competing micro CHP systems.

The high fuel savings of a micro-CHP system compared to large power plants are beneficial for the environment. The main advantage of micro-CHP is that the energy available in the fuel is almost fully utilized. This stands in contrast to conventional power plants which have an average efficiency of only 45% where substantial amounts of heat are lost into the atmosphere or into cooling water. Moreover, micro-CHP saves transmission and distribution losses of electricity from power stations to end-users.

The micro-turbine/EPC system makes it very difficult for the fuel to be used in many micro-CHP applications, ranging from larger private companies and institutions to households. The micro turbine's fuel efficiency combined with its clean combustion technology considerably reduces CO₂ and NOₓ emissions. This means that the energy cost savings of the EnerTwin is substantial higher than the savings that can be achieved by competing micro CHP systems. The EnerTwin can be perfectly integrated with my heating system.
The EnerTwin is a micro-CHP system (Combined Heat and Power) where a boiler and a small power plant are combined in a single robust and durable device. The EnerTwin has been developed by MTT (Micro Turbine Technology BV). The core of the EnerTwin is a micro gas turbine that drives a generator. The micro turbine delivers 3.2 kW electrical power and 15.6 kW thermal power for heating.

Environmental protection

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Higher cost savings due to lower maintenance costs

The EnerTwin has been developed by MTT in collaboration with renowned research institutes and industry partners. Experts from energy utilities and installation companies were also consulted. The EnerTwin is a modern and advanced micro-CHP system.

Certification and safety

The EnerTwin is a modern and advanced micro-CHP system. The system is fully made of components that have to meet demanding specifications. It is also equipped with state-of-the-art safety technology to comply to the latest safety standards.

Examples of applications:

- Small and medium-sized businesses;
- Industries with relatively small steady heat demands;
- Markplaces;
- Large residential homes;
- Houses with a swimming pool and/or facilities;
- Hotels and restaurants;
- Petrol stations;
- Schools, sport schools, gyms and fitness studios;
- Municipal buildings;
- Retail stores;
- Museums and restaurants;
- Clinics;
- Health care centers;
- Elderly homes;
- Government buildings such as town halls, posts offices, fire stations, police stations, libraries.

Higher cost savings due to lower maintenance costs

The EnerTwin can be perfectly integrated with my heating system.

The EnerTwin has the CE certificate for field-testing. During these tests, the EnerTwin was subjected to harsh gas and electricity safety tests. Following extensive safety testing, KIWA has awarded the EnerTwin with the CE certificate for field-testing. During these safety tests, the EnerTwin was subjected to harsh gas and electricity safety tests. KIWA’s CE certificate is valid in all European Union member states as well as in Norway, Turkey and Switzerland.

The EnerTwin is available through professional installation companies and energy utility companies. Selected technicians are specially trained and certified to install and service the EnerTwin. They are certified in both heating technology and electricity technology.

The installation of the EnerTwin is very similar to that of a conventional central heating boiler. In most cases, there is no need to lease open air units or floors, which means that the installation costs are low (plug-and-play). The connection to the electricity grid is similar to that for photovoltaic solar panels.

The EnerTwin may only be serviced by selected technicians. Since the EnerTwin is largely built up of parts that are commonly used in the heating sector, service costs are only slightly higher than those for a normal central heating boiler. As the status of the EnerTwin can be seen remotely by the technicians, servicing is more efficient and unnecessary call-out charges are avoided.

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- Multi-fuel. The EnerTwin is developed to run on natural gas. Versions that run on domestic fuel oil, LPG and biogas are in development.
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More recently, MTT, DLR and several other partners have started a 4-year project for the development of a hybrid power plant which is capable of producing around 50 – 150 kW of electricity. The combination of a micro-turbine and SOFC promises a very high electric efficiency which is expected to go up to 65-70%. Such high levels of conversion efficiencies are unmatched for small-scale electricity generation.

In a hybrid power plant, EnerTwin will boost the fuel cell’s efficiency by ensuring an elevated operating pressure. At the same time, the fuel cell increases the EnerTwin’s efficiency by recuperating exhaust heat into the micro-turbine working cycle. The development project is co-financed by the EU within the Horizon 2020 program.

www.bio-hypp.eu

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EnerTwin
Heat & Power

Micro turbine makes micro-CHP affordable
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