Solutions for generating energy in industry and commerce

Heating systems
Industrial systems
Refrigeration systems
High pressure steam boilers
All part of the service
Industrial systems for steam, power, heating and cooling are developed from a single source for each individual customer, and extended with a comprehensive range of services.

Energy generators and system modules
Steam boilers up to 120 t/h, power stations for generating power up to 50 MW, hot water boilers up to 120 MW and heat pumps for heating and cooling up to 2 MW.

The Viessmann range of services:
Everything from a single source
From consultation and the design concept right through to maintenance, the focus is on the complex lifecycle of the energy system.

Systematic approach: Sample applications for hospitals and the paper industry
By renewing or replacing an energy centre, savings of up to 30 % can be achieved.

International references
International references provide evidence of Viessmann’s expertise. The six systems presented here include ones that use both mono and multi mode operation.

Always nearby
With sales companies and agents in 74 countries, it is quick and easy to get in touch with Viessmann anywhere in the world.
In the four energy areas of steam, power, heating and cooling, Viessmann offers a comprehensive range of products and services for industry and commerce.
Industrial systems for steam, power, heating and cooling

Efficient and clean provision of energy, as well as high operational safety and reliability, are essential requirements for energy generating systems employed by industry and commerce.

Viessmann is the technological trailblazer for efficient energy systems. Matching components and systems are developed from a single source for each individual customer, and extended with a comprehensive range of services.

**Overview of the product range**

The following outputs refer to the largest type of boiler or energy generator. Higher outputs can be achieved by linking individual boilers into cascades.

- **Industrial boiler systems for:**
  - Steam up to 120 t/h
  - Power up to 50 MW
  - Heating up to 120 MW

- **Biomass plants for:**
  - Steam up to 50 t/h
  - Power up to 15 MW
  - Heating up to 50 MW

- **CHP units for:**
  - Power up to 530 kW
  - Heat up to 660 kW

- **Heat pump systems for:**
  - Heating and cooling up to 2 MW

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Waste heat boiler

Biomass plant
Steam up to 120 t/h

Steam generation up to 120 t/h with renewables, fossil fuels and waste heat utilisation

Thanks to their excellent equipment level, Viessmann steam boilers meet the criteria for a variety of application areas. The boilers are robust and require only a low level of maintenance. They form part of a tailor made boiler house concept designed as a system solution for industrial steam generation.

Steam boiler systems
- Steam output up to 120 t/h per boiler
- Operating pressure up to 130 bar
- Hot steam temperatures up to 540 °C
- Systems with shell boilers or water tube boilers
- Broad range of fuel types
- Waste heat boilers to utilise process heat; they can be combined with gas turbines and CHP units
- Modular design

System modules
All of the components Viessmann supplies are matched to the relevant steam boiler system.
- Boilers and superheaters
- Flue gas heat exchanger
- Thermal and chemical treatment plants for feedwater
- Combustion equipment, fuel storage and charging
- Regulating and control systems
- Flue gas scrubbing
- Steam storage
- Boiler platforms
Power generation for on-site requirements and for exporting to the public grid up to 50 MW

Viessmann offers four types of system for industrial power generation which cover a broad output range. They are designed for environmentally responsible CHP operation. The user benefits from reduced costs for power and heat.

**Combined heat and power units (CHP)**
- Output range up to 530 kW\(_{el}\)
- CO\(_2\) neutral operation with bio natural gas
- Equipped as standard for mains substitution mode in the case of power failure (island mode)
- Stringent connection conditions (AR-N 4105) issued by the power supply utility are met

**Steam turbine power stations**
- Output range up to 30 MW\(_{el}\)
- Industrial steam turbines for use with continuous steam processes
- Suitable for efficient power generation

**Gas and steam turbine power stations**
- Output range up to 50 MW\(_{el}\)
- High electrical efficiency in excess of 50 percent
- Flexible operation due to rapid load changes

**ORC systems**
- Output range up to 2 MW\(_{el}\)
- Power generation in a thermal oil-based process
- Use in industrial waste heat processes
- Utilisation of waste heat from ORC process up to 90 °C
Heat generation up to 120 MW with biomass, oil, gas and natural heat

Viessmann offers the right solution for industry and commerce with its energy systems. Users have a choice of high efficiency hot water boilers, CHP units and heat pump systems.

**Heat generators**
- Hot water boilers with an operating pressure of up to 50 bar
  - Fired with oil or gas up to 120 MW
  - Fired with biomass up to 50 MW
  - Waste heat boilers up to 120 MW to utilise process heat; can be combined with gas turbines and CHP units
- CHP units up to 660 kW_{th}
- Heat pumps up to 2 MW per unit (cascades possible)

**System modules**
- Boiler
- Combustion equipment, fuel storage and charging
- Flue gas heat exchanger
- Intermediate flow piece with safety equipment
- Regulating and control systems
- Return temperature raising facility
- Boiler platform

**Quick commissioning through pre-assembled containerised systems**
Time is money – particularly for industrial and commercial enterprises, where new heating centres often have to be operational in the shortest possible time, so that heat for production can be supplied on time. For time saving installation and commissioning, Viessmann now offers pre-assembled containerised solutions that are compact and easy to transport.
Economical cooling with heat pumps up to 2 MW

Customer-specific large heat pumps are available for industry, large residential premises, office buildings and hotels. For industrial and commercial applications, the cooling function of the heat pump is just as important as its heating function – for example, for cooling food storage rooms or providing air conditioning in production rooms.

This energy system has the particular advantage of being able to heat and cool at the same time.

**Large and special heat pumps**
- Individually designed heat pumps with outputs up to 2 MW per unit (cascades possible)
- Able to be installed even in the most awkward spaces
- Implementation of dual mode heating systems in combination with an oil or gas condensing boiler to cover peak loads

**System modules**
- Vitofriocal ice store system
- Dry cooler
- Collectors
3-D boiler house design
The Viessmann range of services: Everything from a single source

The Viessmann comprehensive range stands for innovative and efficient technology at its best. From consultation and design concept right through to maintenance, attention remains focused on the complete lifecycle of the energy system.

**Consultation/design concept**
Viessmann treats all projects individually, with each and every aspect of the design concept being geared towards high efficiency:
- Impartial consultation on technology and fuel type
- Best solution recommended from an ecological and economical standpoint
- Information about national and international legislation and regulations
- Plant analysis
- Viability studies

**Implementation**
Coordination with all technical departments while the system is under construction to ensure timely delivery and installation:
- Design, basic and detailed engineering, site planning
- Manufactured with a high level of pre-assembly to minimise time on site
- Delivery and installation
- Trouble-free commissioning
- Comprehensive output tests
- As-built documentation

**Maintenance/service/training**
Reliable operation is ensured through customer-specific service concepts with guaranteed spare part supply, regular maintenance and boiler checks:
- 24/7 customer service
- Remote monitoring and diagnosis
- Conversion and modernisation
- Service, maintenance and repairs
- Performance of inspections and examinations
- Delivery and installation of spare parts
- Boiler hire
- Training at the Viessmann Academy
System solutions

Systematic approach: Sample applications for hospitals and the paper industry

High cost pressure forces many companies to seriously examine their energy expenditure and take steps to realise potential energy savings. By renewing or completely replacing an energy centre, savings of up to 30% can be achieved.

This means that new technology pays for itself quickly and eases the burden of current expenditure.

Expertise in multi mode heating systems
Viessmann’s comprehensive range offers innovative and powerful technology that can be tailored to the system user’s own aspirations and requirements.

Multi mode systems are increasingly being used for commercial applications, combining renewables and fossil fuels. For this, Viessmann offers the necessary system expertise. For covering the base load, biomass boilers, heat pumps or CHP units are deployed; peak loads are covered by oil or gas boilers.

Combined heating system with a high output and a high level of supply security
The graphic on the left shows a sample system solution: In a hospital, two Vitobloc 200 combined heat and power units (4) generate some of the required power. For heating water and domestic hot water there is also a Pyrotec biomass boiler (2) and two Vitomax 200-LW with Vitotrans 300 (7). Pure steam for clinical applications, e.g. for sterilisation, is produced by the Vitomax 200-HS high pressure steam boiler (8).

For perfect interaction and therefore the highest level of efficiency, Viessmann combines all of the system components in accordance with individual requirements.
Efficient solutions for steam and power generation

Typical applications for steam generation in large volumes can be found in paper mills (above). Here, the associated power station generates steam and electricity. A generator (1) driven by a gas turbine (2) supplies the mill with power. The heat from the combustion gas is used in a waste heat boiler (3) to generate hot steam. A separate high pressure steam boiler (4) supplies the redundancy required for the production process and covers possible peak loads. The output of the power station is equivalent to the energy required for a town of around 50,000 inhabitants.

The greater the energy demand, the more positive the impact of the savings achieved by Viessmann’s highly efficient energy systems. International references provide evidence of Viessmann’s systems expertise. Six systems are presented on the following pages, including ones that use both mono and multi mode operation.
Steam production for the chemical industry

Sembcorp Utilities, Wilton (United Kingdom)
The international energy group, Sembcorp, provides up to 60 t/h steam for several chemical companies on an industrial site.

HKB, one of the Viessmann Group companies, was the general contractor responsible for the construction of the steam boiler system for this project in 2009, based on an individual design. Due to industrial requirements, four Vitomax D HS double flame tube boilers were installed, each with a steam output of 30 t/h. Two of these are kept for redundant backup to ensure high operational reliability. Pre-assembled system modules helped to reduce the installation time.

**Specification**
- Double flame tube boilers: 4 x Vitomax D HS
- Fuel type: Natural gas
- Steam output/boiler: 30 t/h
- Hot steam temperature: 300 °C
- Operating pressure: 17 bar
- Feedwater temperature: 105 °C
- Boiler efficiency: 91 % (without economiser)
- Commissioned: 2009

**Standard delivery**
- High pressure steam boilers
- Burner
- Superheater
- Feedwater system
- Main pipelines, steel structure and platforms
- Chimney stack
- Control unit
**Lotte World Tower, Seoul (Korea)**

The “Lotte World II” skyscraper complex will be 555 m tall. Energy for the building is to be supplied by environmentally responsible technology. Twelve KWT heat pumps will provide the renewable part of the building’s heating and air conditioning supply.

Six brine/water heat pumps, each with 1.7 MW heating output and 1.9 MW cooling capacity, will be supplied by 720 geothermal probes sunk 200 m into the ground. In addition, six water/water heat pumps will be installed, each with 2 MW heating output and 1.7 MW cooling capacity. The latter use water from the river that runs past the tower. All twelve heat pumps will be operated in a cascade, which is controlled by a higher ranking control centre.

**Specification**

<table>
<thead>
<tr>
<th>Heat pump type</th>
<th>12 x special heat pumps</th>
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<tbody>
<tr>
<td>Total cooling capacity</td>
<td>20.4 MW</td>
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<tr>
<td>Total heating output</td>
<td>22.2 MW</td>
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<tr>
<td>Flow temperature</td>
<td>Up to 55 °C</td>
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<tr>
<td>Cold water temperature</td>
<td>Up to 7 °C</td>
</tr>
<tr>
<td>Commissioned</td>
<td>2015</td>
</tr>
</tbody>
</table>

**Standard delivery**

- Brine/water heat pumps
- Water/water heat pumps

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**Natural heat for modern architectural concepts**
E-Werke Frastanz chose to invest in a bioheating plant to supply the Vorarlberg region in Austria with energy from renewable resources. The plant supplies private, public and commercial buildings with natural heat from woodchips all year round.

The chippings are automatically transported from the silo to the combustion chamber using a pushrod discharge system. A flat moving grate (FSB) with variable speed ensures optimum combustion of fuels that have a high water and ash content.

**E-Werke Frastanz (Austria)**

- **Specification**
  - Biomass boiler: 2 x Vitoflex 300-FSB (1100, 550 kW)
  - Fuel type: Biomass
  - Water temperature: 95 °C
  - Boiler efficiency: 85%
  - Commissioned: 2009

**Standard delivery**
- Wood combustion system
- Push floor
- Trough chain conveyor
- Hydraulic feed
- Multi cyclone separator
- Electrostatic filter
- Bunker cover
- Control unit
Bio-Wärme, Gräfelfing (Germany)
The heating centre at Bio-Wärme Gräfelfing GmbH meets all the demands for quality, efficiency and optimum interaction between component modules. The particular focus is on a long service life and ease of maintenance. Both of these factors make a significant contribution to the continuous yet economical operation of the plant, which stands at more than 8000 hours per year.

The Vitoflex boiler used is notable for its low fuel requirements. Wood with a water content of up to w60 can be combusted reliably and cleanly. The boiler’s modulating operating mode matches the system output to the actual heat demand. If required, a Vitomax 200 peak load boiler can be started up as well.

Multi mode heating centre for local heating supply

**Specification**

- **Biomass boiler**: Vitoflex 300-SRT
- **Flame tube boiler**: Vitomax 200-LW
- **Total output**: 3650 kW
- **Fuel type**: Biomass, gas
- **Commissioned**: 2012

**Standard delivery**
- Wood combustion system
- Hydraulic direct feed (fuel transport)
- Pushrod discharge (fuel discharge)
- Flue gas dust extraction using multi cyclone separator
- Hot water boiler
- Control unit
Tropical atmosphere at the Badeparadies Schwarzwald leisure complex

A Vitobloc 200 CHP unit was installed in the Badeparadies Schwarzwald leisure complex to provide low cost power and heat. The system is operational for around 8000 hours per year and primarily produces power for use by in-house consumers. The simultaneously generated heat is used for central heating and DHW, resulting in an energy utilisation level in excess of 90 percent for this CHP system. The Vitobloc 200 provides the base heat load that is required all year round.

In the warm summer months, the CHP unit takes over sole provision of power and heat. During the winter, a Vitoflex woodchip system covers the additional heat demand. For redundant backup and possible peak loads, two Vitoplex 200 low temperature boilers were installed.

**Specification**

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
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<tbody>
<tr>
<td>CHP unit</td>
<td>Vitobloc 200 EM (401 kW_e, 549 kW_th)</td>
</tr>
<tr>
<td>Low temperature boilers</td>
<td>2 x Vitoplex 300 (3200 kW)</td>
</tr>
<tr>
<td>Wood combustion system</td>
<td>Vitoflex 300-FSR (2100 kW)</td>
</tr>
<tr>
<td>Fuel type</td>
<td>Natural gas, oil, biomass</td>
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<tr>
<td>Commissioned</td>
<td>2010</td>
</tr>
</tbody>
</table>

**Tailored system solutions for swimming pools**

CHP unit (left) in the leisure complex. Two Vitoplex boilers cover peak loads when required.
DGUV, St. Augustin (Germany)

At the head office of the German Social Accident Insurance Institution (DGUV) in St. Augustin near Bonn, five Vitobloc 200 CHP units generate the power that is used in the building itself. If there is a public grid power failure, the system can provide emergency power in island mode and safeguard the necessary power demand. The mains substitution management this requires is provided by the Viessmann multi module management system 300.

The heat generated by the CHP plant is mainly used for operating absorption refrigeration machines and for heating the building. If required, a Vitoplex 300 low temperature boiler supplies additional heat.

**Specification**
- CHP units: 5 x Vitobloc 200 EM (238 kWel/363 kWth)
- Low temperature boiler: Vitoplex 300 (1250 kW)
- Fuel type: Natural gas, oil
- Commissioned: 2012

**Standard delivery**
- Combined heat and power units
- MMM 300 multi module management system for mains substitution management, including active load distribution
- Low temperature boiler
Further information can be found in the engineering and product brochures.

Easy to order from
www.viessmann.de/industrie
All of the information you need is just a click away: online at www.viessmann.de/Industrie

With just a few clicks of the mouse, trade partners, design engineers and operators can go online to discover Viessmann’s entire range of products and services for industry, commerce and local heating networks.

**Viessmann references**

Advanced and efficient energy systems from Viessmann are in use in many large buildings, making an important contribution to the sustainable exploitation of energy reserves.

Detailed information on international reference systems can be found in the database on the Viessmann website.

The website for industrial energy systems provides information about all of our products.
Proximity to customers and rapid availability are important criteria for the professional design and implementation of energy systems for industry and commerce. Viessmann is represented in major industrial countries with its own sales offices and experienced experts. They ensure that every energy system, whether it is for steam, power, heating or cooling, is individually tailored to the required application. This includes ongoing support after successful commissioning.

www.viessmann.com
All members of the Viessmann Group are represented here, along with a short summary of each company, to provide insight into the wide variety of powerful energy systems that are on offer.