BIO ENERGIE KÄRNTEN

Our energy is supplied by nature

Highly efficient
Commercially viable
Sustainable
Carbon-neutral

www.bioenergie-kaernten.at

Climate goals

Protecting the climate is one of the toughest challenges we face this century. Avoiding fossil fuels, such as oil and gas, is one of the main goals of all 197 countries.

On signing the Paris Agreement, the global community of states, including Carinthia, is obliged to implement the agreed goals. If we are serious about taking responsibility for present and future generations, this means turning away from coal, oil and natural gas and switching to renewable energies.

All three biomass cogeneration plants located in Klagenfurt and Liebenfels guarantee security of supply with district heating and green electricity and thus make a considerable contribution to climate protection.

So far, the city of Klagenfurt has saved 276,000 t of CO_2 due to climate protection measures, half of which was achieved by switching the district heating supply from ossil fuel to biomass.

Dr. Wolfgang Hafner, Department Head of Climate and Environmental Protection; Municipal Administration of the state capital of Klagenfurt a. Ws.

Positive effects

The state capital Klagenfurt a. Ws. has been a member of the ambitious European movement "Convention of Mayors for Climate and Energy" since 2011.

This initiative aims to reduce CO2 emissions by 20% and at the same time increase the share of renewable energy by 20% by 2020. The aim is to reduce CO2 emissions by 40% by 2030.

The overriding goal of the Smart City strategy practised by the state capital Klagenfurt am Ws. is virtually complete decarbonisation by 2050. The proposals for measures developed in the city's fields of action make it possible to achieve the targets and place emphasis on maintaining a high quality of life for present and future generations.

By constructing and operating the Ost, Süd and Nord biomass cogeneration plants, it has been possible to increase the share of renewable energy in the supply mix of Klagenfurt's district heating to over 80%.

Benefits for the city::

- Achieving the Paris climate goals
- Reducing emissions of respirable dust and NOx
- Strengthening the economy by using domestic raw materials and technology
- Developing into an energy-efficient, resource-saving and low-emission living space with a high quality of life
- 94 MW green heat
- Bioenergie Kärnten supplies 22,155 households from its Ost, Süd and Nord locations; at approx. 450,000 MWh that is 80% of the CO2-free district heating requirement
- Around 40,000 households are supplied with 140,000 MWh of green electricity as a by-product of district heating generation
- In the field of heat generation, Klagenfurt is positioning itself as a leader for sustainability and climate protection in Europe, thus paving the way for complete carbon neutrality

DI(UAS) Markus Poppe
Commercial Management

Ing. Johann Moser
Technical Management

Bioenergie Kärnten

Bioenergie Kärnten is part of the Bio Energy Group and supplies Klagenfurt and Liebenfels with green heat and electricity from three biomass cogeneration plants. The cogeneration process means the production of green electricity in addition to heat. All three biomass cogeneration plants in Carinthia are characterised by innovation and modernity. They are considered to be highly efficient, commercially viable, sustainable and carbon neutral.

The vision of the BIO ENERGY GROUP is to design, implement and subsequently operate turnkey, highly efficient and commercially viable biomass cogeneration plants throughout Europe. This is our way of making a contribution in Europe towards the medium-term development of an efficient and renewable energy system in which sustainably produced biomass plays a role. The common goal of Bioenergie Kärnten and Stadtwerke Klagenfurt AG is to further improve the quality of life and the air quality in Klagenfurt and to make Klagenfurt a model city in bioenergy production through the use of cutting-edge technology.

Bioenergie Kärnten has a total of 30 employees working at three locations and is a strong and reliable partner for regional agriculture and forestry.

Please feel free to contact us if you have any questions about bioenergy.

Contact

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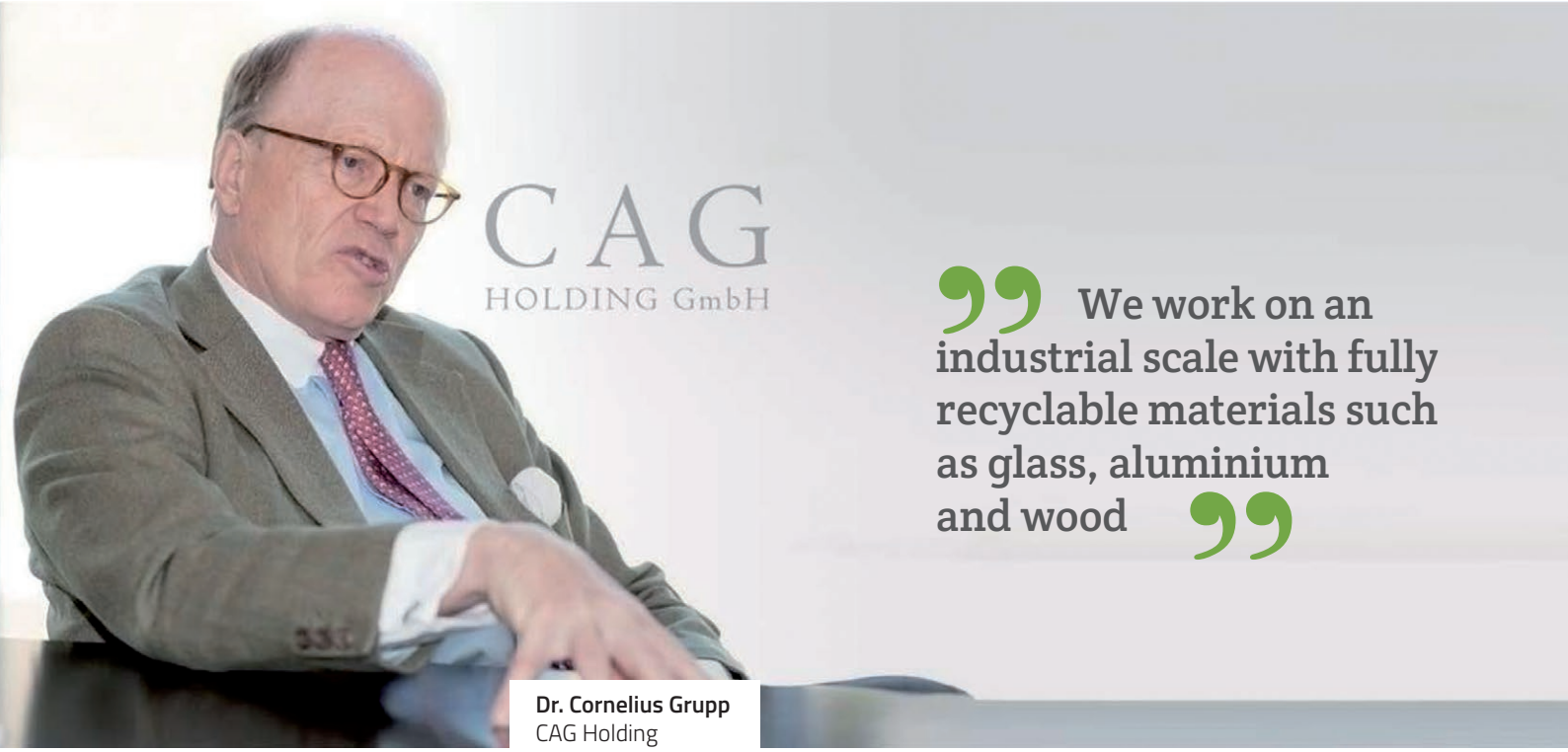


Dr. Cornelius Grupp
CAG Holding

The Dr. Grupp corporate group

Dr. Cornelius Grupp is the sole shareholder of CAG Holding. It employs 8,000 people at 45 production sites worldwide and generates annual sales of around 1.5 billion euros.

TUBEX GROUP
NEUMAN ALUMINIUM INDUSTRIES
STOELZLE GLASS GROUP
BIO ENERGY GROUP BIO ENERGIE KÄRNTEN
PREFA Dächer, Fassaden und Komplettsysteme aus Aluminium

Dr. Cornelius Grupp

"I believe that any investment made in this day and age cannot have a purely economic function and, in our case, also has an environmental component. In today's world, it is necessary for investments to be seen from a different, very broad base.

I am pleased and proud that we are making an important contribution to the independent energy supply of the city of Klagenfurt with our biomass cogeneration plants which produce green electricity and green heat."

The cogeneration plants

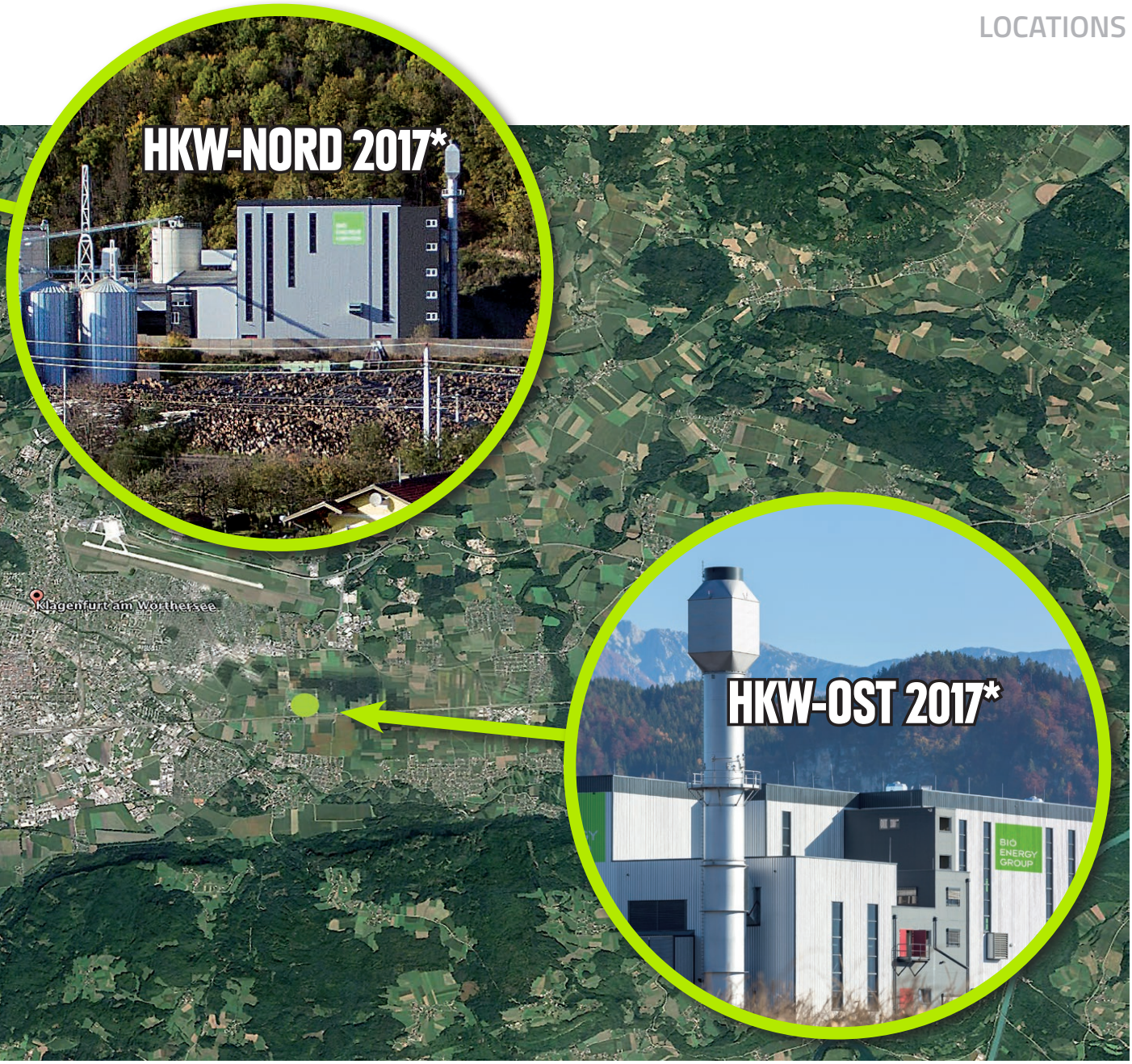
The biomass cogeneration plants are impressively modern and feature the latest technology. They use the highest possible standard of current plant technology, setting new standards for energy production from biomass. Klagenfurt and Liebenfels are supplied with 100 percent green heat from the biomass cogeneration plants.

Achievements

Achievements of the 3 locations
with over 80% heat:

Green heat
94 MW output with
5 steam boiler plants and
2 heat pumps

Green electricity:
20 MW output with 3 steam turbines



(*) including heat recovery and absorption heat pump

Levels of efficiency exceeding 90% are achieved due to the combined heat and power technology, heat recovery by means of flue gas condensation and the two heat absorption pumps.

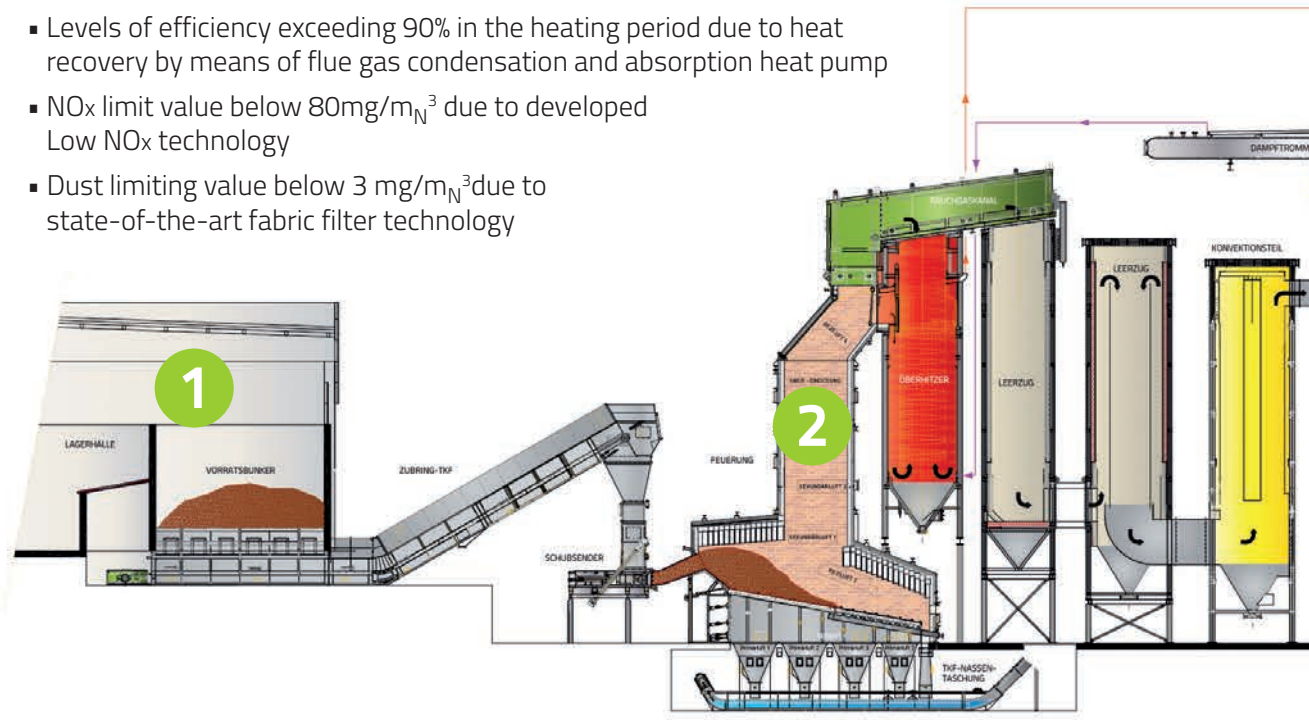
Over 80%

HEAT
of the district heating requirement for the state capital Klagenfurt

New standards in biomass-fired plants:

Schematic diagram for constructed plants CHP Ost and CHP Nord | RZ 2017

- Levels of efficiency exceeding 90% in the heating period due to heat recovery by means of flue gas condensation and absorption heat pump
- NOx limit value below 80mg/m_N^3 due to developed Low NOx technology
- Dust limiting value below 3 mg/m_N^3due to state-of-the-art fabric filter technology



1 Fuel requirements

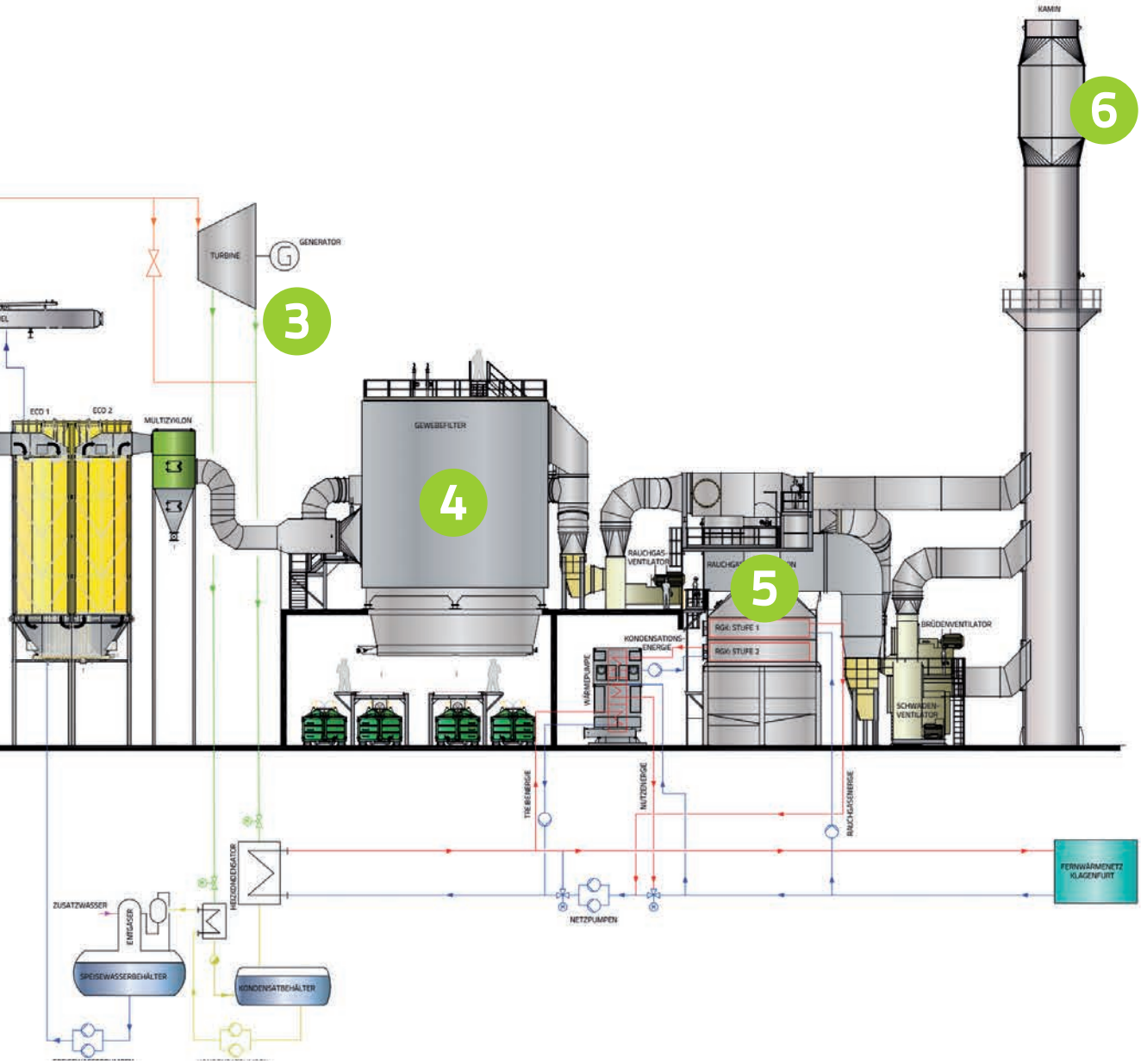
Bioenergie Kärnten's biomass cogeneration plants use by-products from forestry (logging residue, branches, coarse wood chips). If this exclusively untreated raw material, which arises during timber harvesting and forest management, were to remain unused, it would barely be possible to keep down pests such as bark beetles and the environmental balance would be jeopardised. Biomass is therefore essential for forest management and a functioning timber market in Austria.

2 Steam boiler plants

Superheated high-pressure steam for the cogeneration of power and heat is produced in the steam boiler plants from untreated biomass. The steam boiler plants are designed as natural-circulation steam boilers with a water tube structure which, due to the correspondingly low specific load and low flue gas flow velocities in all firing and boiler components, do not require any cleaning of the heating surfaces. This design philosophy is ultimately the basis for low-emission combustion but also for high combustion efficiency with a long service life.

3 Steam turbine

A multi-stage reaction steam turbine with the highest possible turbine efficiency was selected as the steam turbine which is used purely as a "heating turbine". All the exhaust



steam is therefore converted into hot water for heat extraction in the heat exchanger arranged below (= heating condenser). The energy released during steam expansion in the turbine drives the turbine rotor, which transfers the energy to the generator via the spur gear for electricity generation. The net electricity generated is fed into the public grid.

4 Fabric filters

New standards for dust limit value in biomass-fired plants. The dust level falls significantly below dust limit values of 3 mg/m_N^3 due to the use of cutting-edge fabric filters.

5 Heat recovery opens up new horizons for fuel efficiency

State-of-the-art heat recovery systems which exceed efficiency levels of above 90% during the heating period were installed in the Klagenfurt Ost and Liebenfels Nord biomass cogeneration plants. The technology employed extracts the latent heat from the exhaust gas at very low temperature and uses the absorption heat pump to raise it to a temperature level suitable for use in the district heating network.

6 Stack

The flue gas leaves the stack at approx. 30 °C so there is no formation of steam clouds.

Biomass

Highly efficient
Using biomass in heat-controlled cogeneration plants is the most efficient form of thermal power generation.

Sustainable
Biomass uses forest by-products and residual materials and is considered an optimum source of sustainable energy. Biomass cogeneration plants replace coal-fired, oil-fired and nuclear electricity, protect our climate and can replace oil as the most important energy source by 2030.

Commercially viable
The use of biomass for producing energy is a significant revenue stream for many agricultural enterprises which promotes not only the local economy but also the rural area.

Carbon-neutral
Biomass delivers clean energy from our region and is completely carbon neutral. Biomass is considered a clever and sustainable energy source which reduces greenhouse gases and prevents catastrophic environmental impacts on humanity.

Fuel requirements:
1 million cubic metres per year

Mag. Harald Tschurnig
STW Management Board

Frank Frey
City Council

Dr. Maria-Luise Mathiaschitz
Mayor of Klagenfurt

DI Erwin Smole
STW Management Board

True success story

Bioenergie Kärnten proves to be a strong and reliable partner! With its three state-of-the-art biomass cogeneration plants, it ensures the district heating supply for the state capital and supplies Stadtwerke Klagenfurt with green energy around the clock. We are therefore becoming independent of uncertain markets and fossil fuels. The ultimate aim is comfortable, clean heat combined with convenience, sustainability and quality of life. These are real milestones in the energy supply and proof that there can be harmony between the economy and the environment.
Dr. Maria-Luise Mathiaschitz,
Mayor of Klagenfurt a.WS.

Indispensable raw material

As a city councillor for environmental protection and energy efficiency, I am more than satisfied with this type of energy supply. Bioenergy relies on our wood: an indispensable raw material that constantly regrows! I am particularly pleased that Klagenfurt, due to the massive use of biomass, could become Austria's "greenest state capital"!
City councillor Frank Frey

Reliable partner

Stadtwerke Klagenfurt has been supplying district heating to satisfied customers for 70 years. For around two years, we have gradually been developing this gratifying success story with Bioenergie Kärnten with three biomass cogeneration plants, using state-of-the-art technology to pump "green power" into the STW district heating network which is more than 180 kilometres long. As one of Carinthia's largest municipal utility companies, Stadtwerke Klagenfurt relies on sustainability in practice, increasing quality of life, a future-proof infrastructure, secure public services and intact environmental and climate protection.
STW Management Board DI Erwin Smole and Mag. Harald Tschurnig

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is supplied
by nature

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