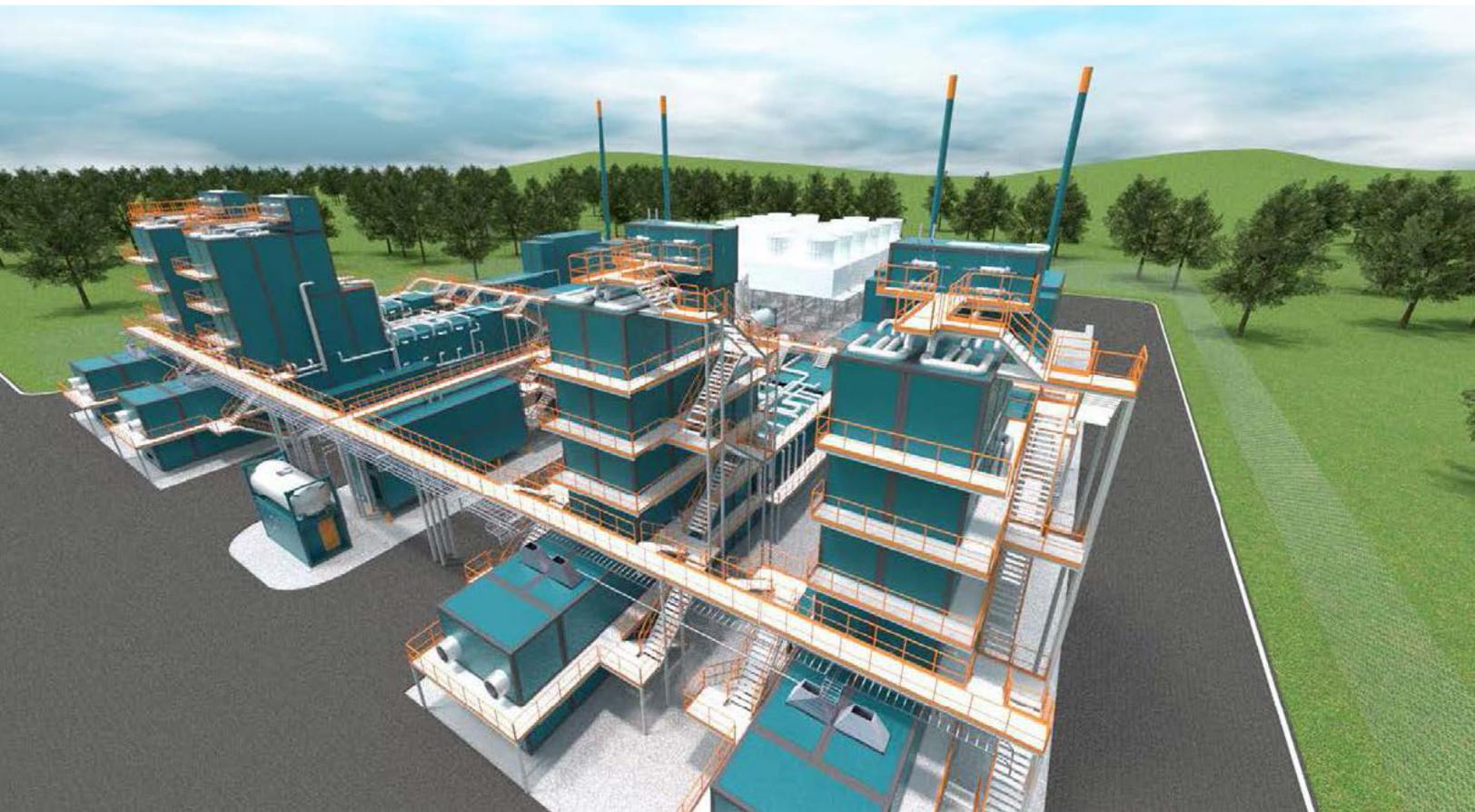


Waste-to-Energy Solutions

Heat and Power generation
using solid waste





Modular Waste-to-Energy Power Plants

Together with our strategic partner, WOIMA Corporation, we deliver turnkey waste-to-energy power plants, *wasteWOIMA*®, based on a low-cost, quick delivery concept using well-proven and robust grate combustion technology.

The world produces about two billion tons of municipal solid waste (MSW) per year, of which more than 70% is still being landfilled, often at non-sanitary dump sites. Utilizing this locally available waste as a resource to produce electricity or heat does not only mitigate its environmental impact, but also reduces dependency on fossil fuels that often must be imported.

For small and medium-size cities, *wasteWOIMA*® is the perfect solution for combining local waste management with energy production. The small-scale decentralized solution reduces the logistical challenges, costs and carbon footprint of collecting and transporting waste associated with large centralized incinerators. Generation of energy close to consumers also avoids the need for transmission of electricity and heat over long distances, causing higher losses and often not possible.

A *wasteWOIMA*® plant can serve a waste collection area between 100,000 and 500,000 residents and sustainably convert from 30,000 up to 200,000 tons of non-recyclable waste annually into renewable energy; electricity, district heating or cooling, industrial process steam or a combination of these.

The *wasteWOIMA*® concept is based on a pre-engineered, modular plant with factory-fabricated modules, shipped to site largely in standard-size containers. The containers are easy to transport and provide secure and protective enclosures during shipment and storage at site.

For the customer this unique and robust concept means a reliable, high-quality and cost-effective solution with simple and fast construction and commissioning at the site, typically within four months from delivery. The overall time from start to commercial operation is typically between 15 and 18 months. Advanced plant automation and standardized operation & maintenance ensure high plant availability, lower the manpower requirement and reduce operating costs. *wasteWOIMA*® plants are designed for a 30-year lifespan in the harshest of conditions.

The plant is scalable with one to four combustion lines, each capable of converting 30,000 to 50,000 tons of waste annually into energy:

- ▶ 3.4 MW of electricity,
- ▶ 2 MW of electricity and 10 MW of heat, or
- ▶ 17 t/h of steam at 400°C / 40 bar,

and in compliance with stringent environmental standards. The heat from the plant can also be used to produce 200 m³ per day of drinking water out of seawater.

In addition to this output flexibility, the wasteWOIMA® plant can handle a wide range of non-hazardous solid wastes and biomass fuels as input, including:

- ▶ municipal solid waste (MSW),
- ▶ recovered waste fuels (REF, RDF or SRF),
- ▶ industry, commerce and institution waste (ICI),
- ▶ construction and demolition waste (CDW), and
- ▶ agricultural waste streams (AW) and different biomasses, such as EFB and rice husk,

with calorific values between 7-20 MJ/kg and a moisture content up to 55%. The plant automatically adjusts itself to variations in fuel quality and quantity to deliver a constant energy output. The delivery scope is also flexible and can be adjusted to your needs, from a boiler plant to a complete waste-to-energy plant. The basic plant design can be complemented with several different standardized auxiliary systems to match your application:

- ▶ evaporator to produce boiler water and/or safe potable water
- ▶ reverse osmosis installation for demineralized water
- ▶ landfill leachate treatment system
- ▶ flue gas condenser to recovering the evaporative heat otherwise lost through the stack
- ▶ Organic Rankine Cycle (ORC) electricity generation module instead of a steam turbine

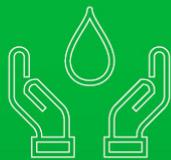


KEY CUSTOMER BENEFITS

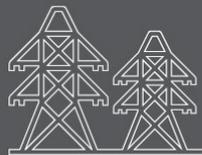
- ▶ Scope to your needs—from boiler plant to complete waste-to-energy plant
- ▶ Less site preparation works—light plant modules only require flat concrete slab
- ▶ Fast support during project development and permitting
- ▶ Simple and fast construction and short time to commercial operation
- ▶ High quality—factory-fabricated modules and reduced site welding
- ▶ High reliability—proven and robust combustion and flue gas cleaning technologies
- ▶ Compliance with stringent EU environmental standards
- ▶ Flexibility—production of electricity, combined heat and power, or only steam, and wide range of solid wastes and biomass fuels
- ▶ Scalable—one to four combustion lines with 30,000 to 200,000 tons of waste annually
- ▶ Lower operating cost—standardized operation & maintenance
- ▶ High plant availability—ensured by long term service agreement and remote monitoring

ABOUT WOIMA

WOIMA focuses on waste-based power generation solutions that utilize e.g. municipal solid waste (MSW), wastewater sludge, industrial, commercial & institutional waste (ICI) and agricultural waste (AW), as well as engineered waste fuels like REF, RDF or SRF. WOIMA helps investors, waste management companies and independent power producers (IPPs) to realize the hidden potential in waste, while protecting the environment and creating local jobs.



CLEAN WATER



ELECTRICITY



STEAM



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Our vision is to provide sustainable energy solutions through decarbonization, decentralization and digitalization of the energy industry. Our capabilities cover customer needs in the fields of power generation utilizing circulating fluidized bed (CFB) technologies, long term energy storage, and related network services. We continuously broaden our portfolio of products and services by advancing our in-house technologies and developing further alliances with new partners.

Our Values

Respect for people.

Valuing and inviting differing views and ideas

Committed to customers.

Exceeding expectations and providing value

Safety, integrity and teamwork.

Incorporating ethics in everything we do

Ownership of results.

Personally ensuring that success is achieved

Passion to innovate and grow.

Setting challenging goals for growth



Sumitomo
SHI **FW**