



More revenue, higher yield

Electrification, automation, and
power solutions for the fiber industry

[siemens-energy.com/fiber](https://www.siemens-energy.com/fiber)

SIEMENS
ENERGY

The fiber industry of tomorrow

The pulp and paper industry is preparing for the future. It is not only showing positive growth rates, it is already taken a leading role in the closed-cycle economy by making optimal use of resources, integrating waste products into processes, optimizing energy requirements, transforming into a self-sufficient energy cycle, and using digitalization tools.



Efficiency requires twenty-first century technology

Paper mills can meet the requirements of today and tomorrow with:

- advanced technology for optimal efficiency
- maximum plant availability
- long-term security for your investments



Long-term profitability based on a consistent, end-to-end portfolio

Increase your overall efficiency and reduce your energy costs with:

- our power generation equipment for combined heat and power (CHP)
- our integrated drives portfolio and automation technology
- our integrated software and service solutions
- long-term security for your investments



Sustainability grows with greener solutions

The shift to a closed-cycle economy and the optimization of process set-up helps reduce and even prevent pollution. With the help of our products and solutions, you can significantly reduce your carbon footprint.

- Decrease carbon emissions by 15 to 40 percent with CHP (compared with the separate provision of heat and electricity)
- Substantially boost your plant's energy efficiency and improve energy consumption with our wide range of innovative SIPAPER automation and drives technologies

Siemens Energy partnered with Propapier PM2 in Germany and delivered Sipaper solutions and power generation equipment.

Turn challenges into opportunities

Pulping, tissue manufacturing, or producing board and other fiber applications – your challenges and requirements are as different as your products and business objectives. New, low-cost, highly efficient, and reliable approaches are key in your daily business. Or perhaps you are moving toward a closed cycle in your material flow?



Are you looking for low costs and high operational effectiveness for your plant?

To ensure your competitiveness, you need to reduce your costs while also boosting your productivity. To accomplish this, you need a high level of process understanding. Based on our years of experience, we offer you tailor-made solutions with high-efficiency components and services.

- Reduce your costs and **optimize** your operation thanks to intelligent process automation
- Our turbines perfectly match your **flexible** production processes
- Thanks to optimized lifecycle costs, you'll benefit from the highest **returns**



Is reliability your top priority?

Maximum process reliability is required in order to achieve the lowest cost per ton of produced paper – which means that process interruptions are a major issue.

- Our products, systems, and solutions are designed with maximum reliability and availability, low wear, and long maintenance intervals to **minimize** or prevent these interruptions
- Process **stability** at a low cost is ensured by our state-of-the-art turbine technology, drive and automation technology, and optimal process integration
- Targeted **steam management** within the process and intelligent energy management are provided by our power supply solutions



Would you like to boost the efficiency of your power supply?

Developing a separate system for power generation that allows you to operate independent of the public grid will pay off quickly.

- Special **service** concepts and optimized solutions with standardized turbine modules feature short installation time, long service life, and reduced maintenance intervals and lifecycle costs



Are you ready for new approaches?

The by-products of pulp production like electricity, biogas, and turpentine as well as the surplus energy from your own power generation system are valuable commodities.

- Sell energy back to the grid or use it to supply neighboring districts with central heating
- Increase the yield by implementing processes for **innovative biochemicals**

Effectiveness and flexibility call for digitalization

Siemens Energy's digitalization solutions get you ready for the future with process transparency, data analytics, and predictive services to ensure your competitiveness. As our partner you will profit from our expertise in electrification, automation, and digitalization.



Our SIPAPER digitalization portfolio covers all lifecycle steps from integrated engineering to integrated operation

Process automation: Enhanced efficiency

- Integrated system for service and root-cause analytics
- Faster ramp-up of production thanks to flexible and reliable simulation of the software in advance
- Simple testing of later modifications and changes in the production, as well as off-site training and simulation for operators
- Continuous optimization of production resources and energy consumption via remote analytic systems in an open IoT system

Steam management and power generation: Extended lifecycles

- Condition-based maintenance and service through remote monitoring control
- Advanced power diagnostics center operators are able to efficiently control processes in the power generation plant
- Pioneering, customized digital services that enable new maintenance models

Horizontal integration with SIPAPER Drives

Integrated drive portfolio: All frequency converters, motors, couplings, and gear units from a single source. Perfectly integrated, seamless in interaction. For all performance classes. As a standard or totally customized solution.

You can boost the availability of your application or plant – by up to

100%

Integration with SIPAPER DCS APL

Integrated in the automation technology: from the field level to the controller level, to the MES, thanks to PCS 7. For every application.

With PCS 7, you can cut your engineering time – by up to

30%

Substantial savings on engineering costs

Lifecycle integration

Integrated software and services throughout the entire lifecycle. For higher performance and maximum investment security.

Thanks to Integrated Drive Systems, you can cut your maintenance costs – by up to

15%

Increases your profitability

Power generation integration with SIPAPER Power

Integrated state-of-the-art power generation equipment: earn extra revenue with Siemens Energy steam and gas turbines.

Siemens Energy steam and gas turbines deliver efficiency gains (compared with older units) – of up to

20%

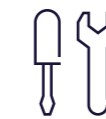
Comprehensive solutions for all disciplines along the process chain

Boost your productivity: Whether you want to increase availability and minimize downtime or improve the quality of your products and optimize your energy requirements – with our automation, electrification, and power solutions for the fiber industry, you and your plant will be ideally equipped to handle any task.



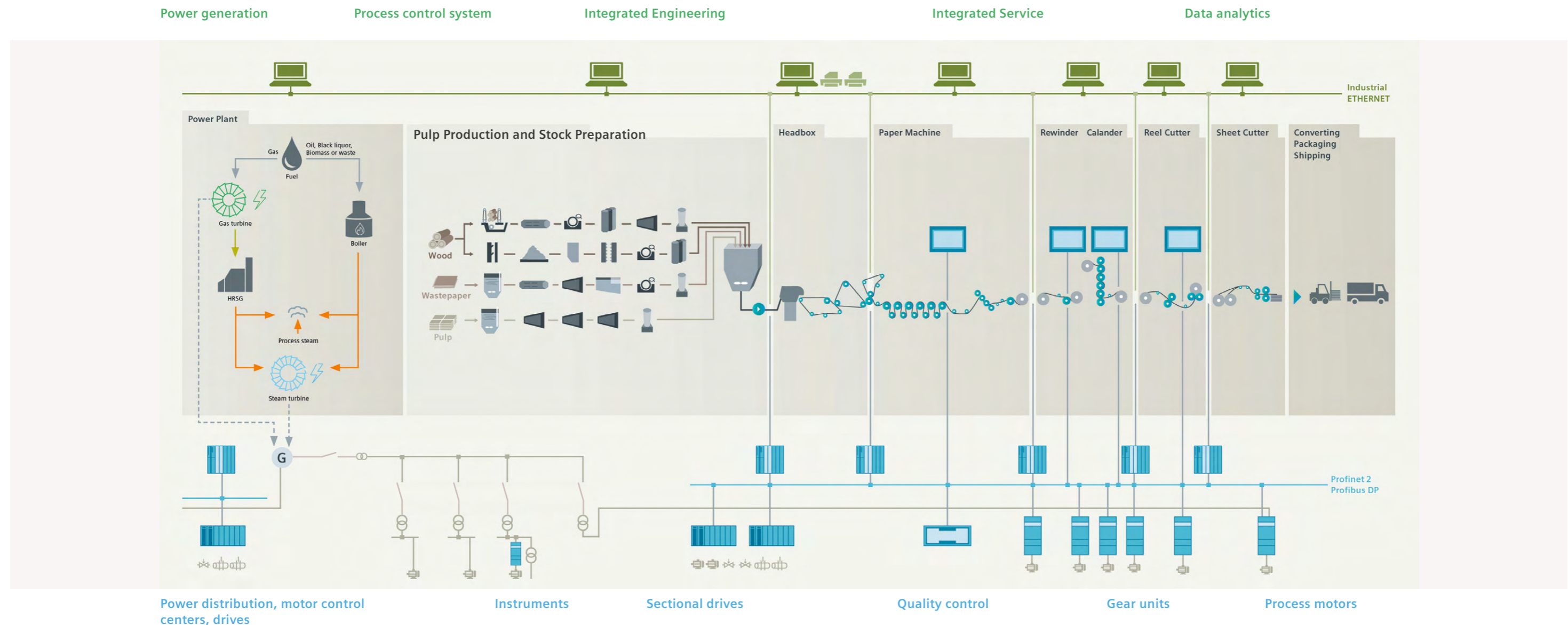
Consulting from an early stage

To increase your level of competitiveness with our systems and solutions, we start every project with in-depth consulting. This is the basis for selecting the sophisticated equipment you'll need to optimize your production plants and systems. It also gives us the information we need for developing customized turbines and automation, drives, and power distribution solutions precisely tailored to your needs.



Service just for you

An industrial plant is only as good as the service that maintains it. We'll offer you services that are precisely tailored to the unique features of your plant and that match your products and processes. You'll benefit in particular from the comprehensive offerings in our Siemens Energy Industry Services portfolio, including predictive maintenance, online and technical support, spare part service, and field service.

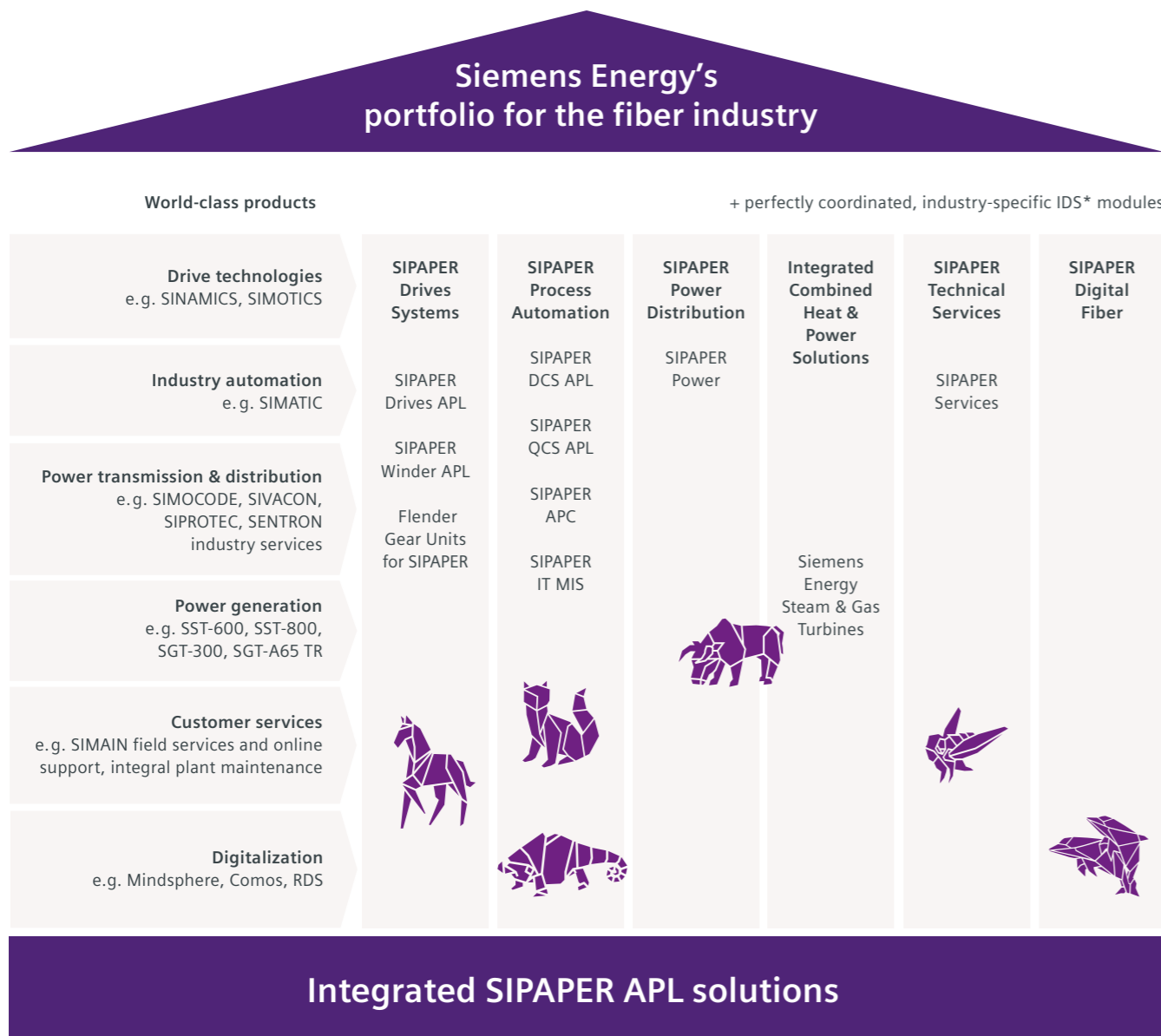


SIPAPER Drives, Schoellershammer GmbH & Co. KG,
PM10, Germany



The right product for any challenge

Our unique portfolio covers drive technology and automation as well as power generation, transmission, and distribution – with proven components and advanced technology for optimal efficiency, maximum plant availability, and long-term security for your investment. The precisely aligned solutions can be individually modified to fit your processes and are based on our in-depth knowledge, comprehensive R&D, and more than 100 years of experience as a partner to the fiber industry.

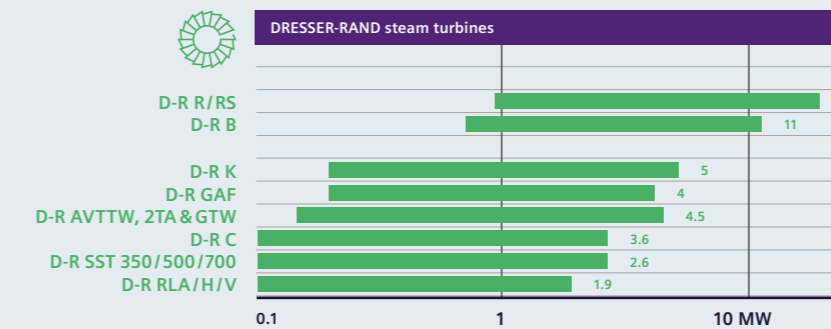
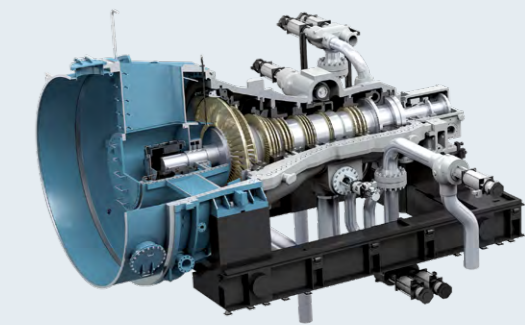
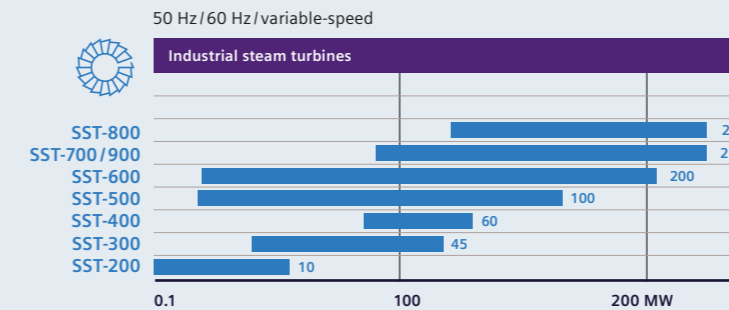


* IDS = Integrated Drive Systems

Our portfolio

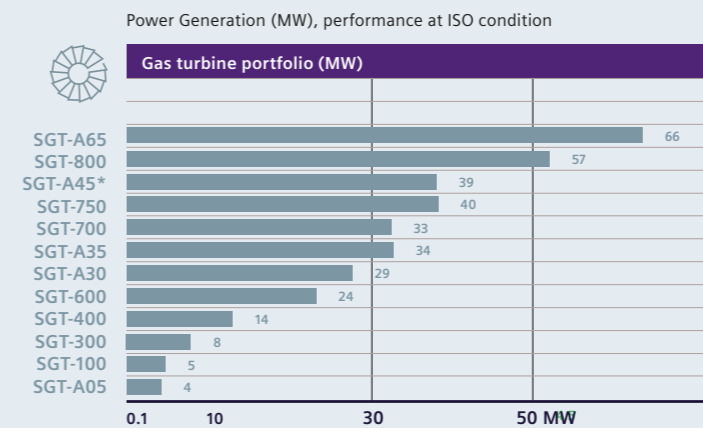
Steam turbines from 10 kW to 250 MW

Our steam turbines span the power range from 10 kW to 250 MW and will meet all steam system requirements in the fiber industry. Of course, they comply with API standards as well as all customer specifications.

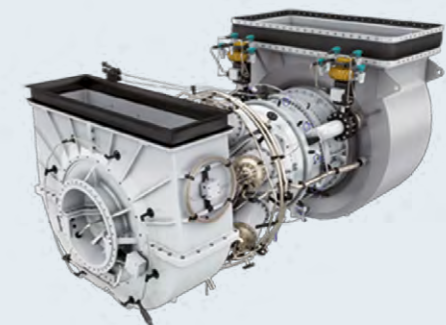


The best gas turbines for your fiber applications

Below shown gas turbines in our portfolio are optimally suited for the fiber industry. We also offer more gas turbine models in a wide power output range that may meet your specific needs.



* Mobile unit cold water

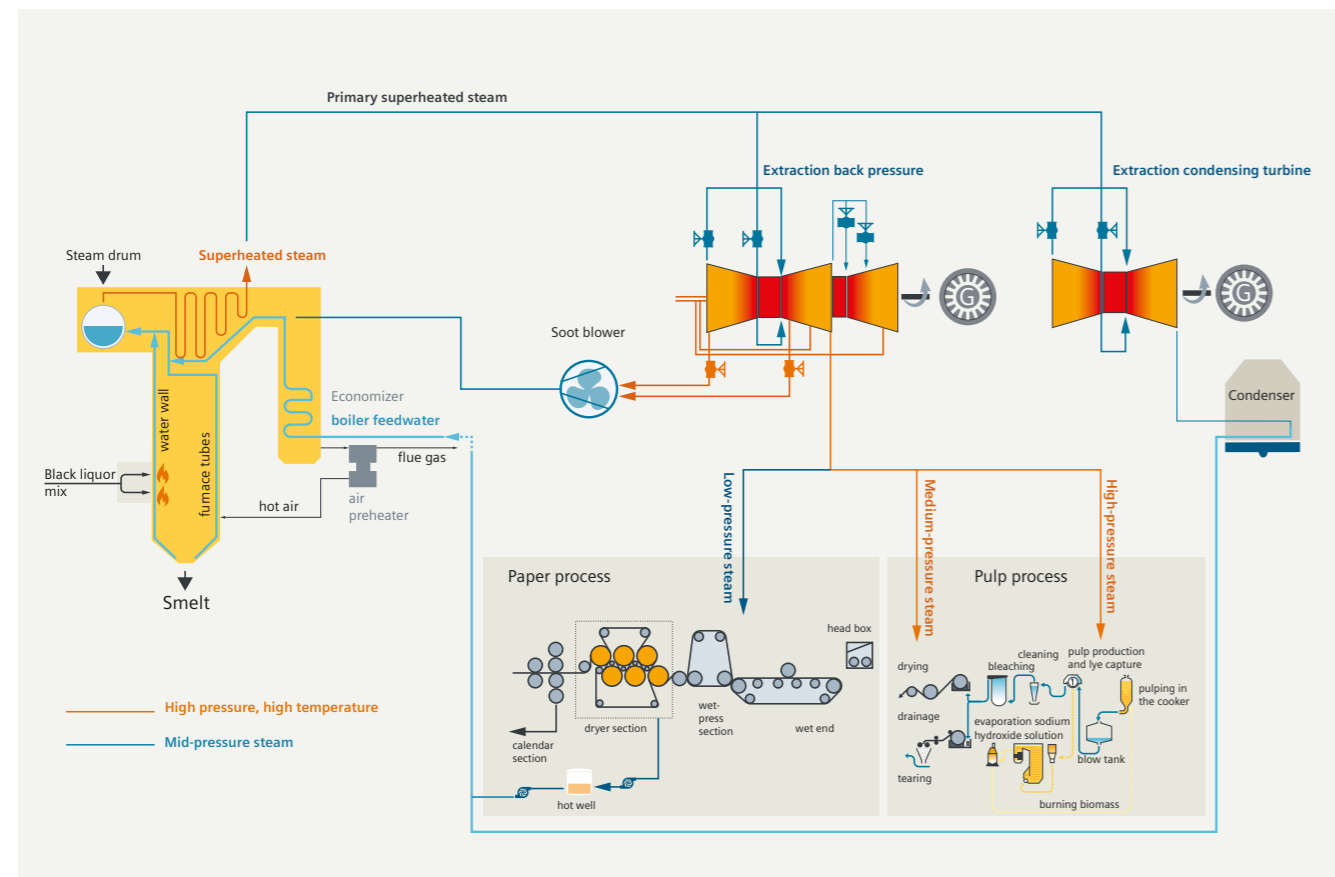


Managing the water-steam cycle

As market leader in steam turbines for the fiber industry, we know the importance of a flexible turbine design and customization.

That's why we provide steam turbines with various uncontrolled and controlled extraction options adapted to the steam flow in your process. We can offer the precise number of extractions indicated by your process requirements.

Typical combined heat and power cycle in pulp and integrated mills

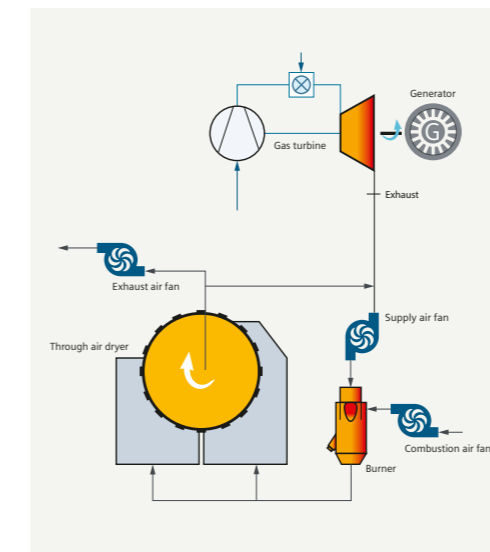


Implementation of a gas turbine in tissue drying process

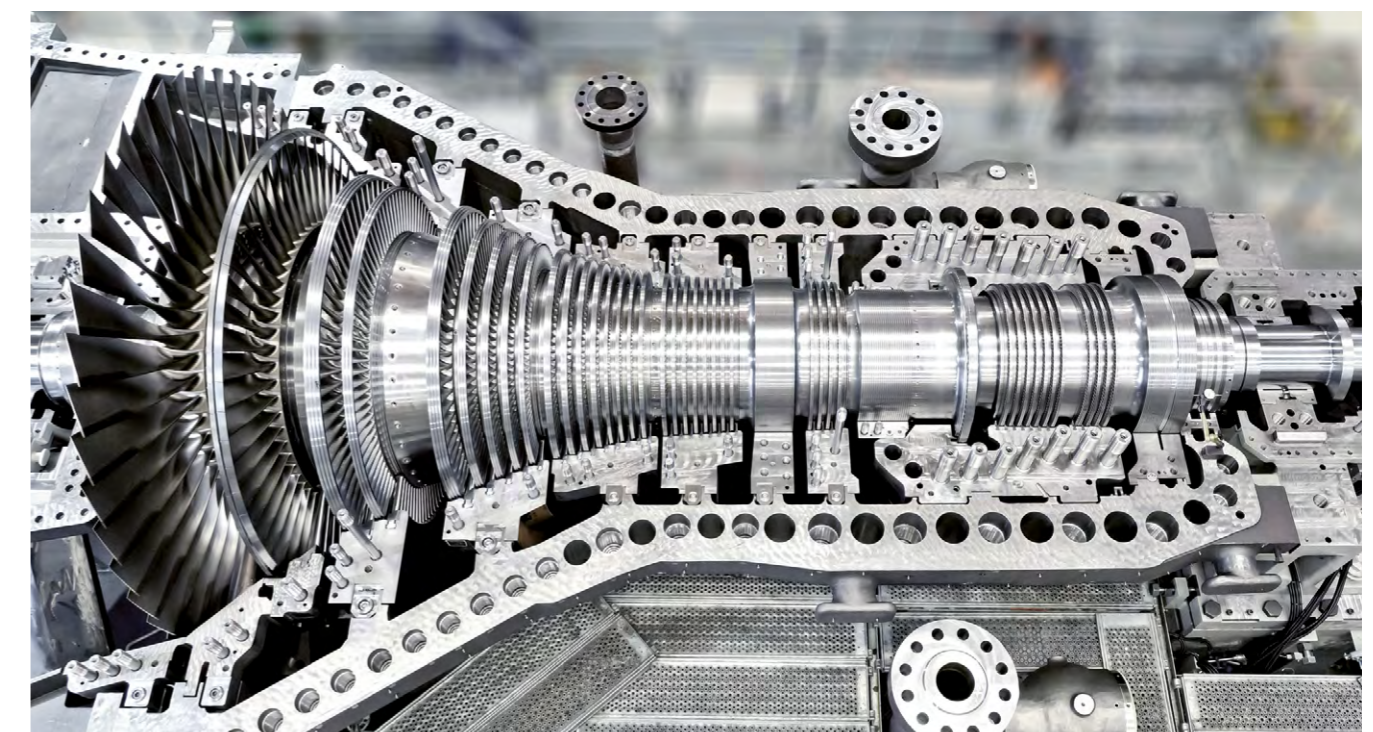
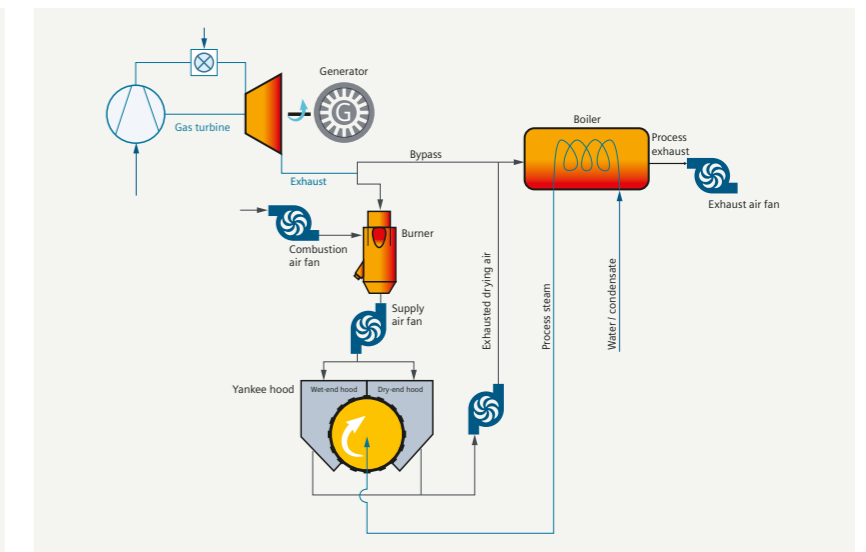
The Yankee drying process is the most common drying method. Small gas turbines are desirable for use in the Yankee process because the demand for hot air is lower compared with the Through Air Dryer (TAD) process. TAD uses heat to dewater the product instead of the conventional

mechanical pressing. This produces a much softer paper and reduces the demand for raw material from 8% to 30%, but dramatically increases the drying load. The high demand of hot air means that the implementation of gas turbines up to 10 MW is profitable for the TAD process

Gas Turbine for TAD



Gas Turbine for Yankee Dryer



SIVACON

SIPAPER Power and SIPAPER Drives at Propapier,
Eisenhuettenstadt PM2, Germany



Success stories throughout the paper world

We have been proving our expertise in the global fiber industry for decades. Based on our comprehensive experience in automation, electrification, and power generation and in the paper production domain, our solutions help ensure your success in the competitive fiber market.

Stora Enso is the world's leading producer of liquid packaging board, which is one of the most demanding and high value-added products in this industry. The Stora Enso Beihai mill has an annual capacity of 450,000 tons of liquid packaging board and other high-grade paperboard products. Stora Enso's operations in the Guangxi region also consist of tree plantations with roughly 85,000 hectares of land leased since 2012. The plantations have been certified to the standards of the Forest Stewardship Council (FSC®) and the China Forest Certification Council (CFCC), and they will continue to provide a sustainable, cost-competitive, and self-sufficient fiber base for the mill.





The project began at a greenfield site. In addition to the board machine, the scope included a full site with infrastructure, power plant, water and effluent treatment capacities, and a bleached chemo-thermomechanical pulp mill (BCTMP) with an annual capacity of 220,000 tons. Siemens and Siemens Energy were contractees as suppliers of electrification and automation, from power generated by a steam turbine to integrated automation to predictive maintenance service. An integrated drive system from Siemens Energy with over 160 drives is installed in the packaging board machine, which is over 300 meters long. The predictive maintenance service provides state-of-the-art maintenance solutions that operate on an entirely new level.



Birdview of Beihai Mill

Virgin fiber for the production of liquid packaging

Stora Enso Beihai Mill, Guanxi Integrated Project and Operations (GIPO), State of Guangxi, China

	450,000 t/a high-grade carton board products		SST-800 steam turbine with 59-MW power output
	85,000 ha tree plantation	160	Integrated drive system for 160 drives
	Automation system with 8,200 DCS loops, 20,000 I/O	1,000	1,000 panels for power distribution

Benefits

- Predictive maintenance solutions
- High efficiency and availability thanks to harmonized Simotics low- and medium-voltage motors and Sinamics frequency converters
- A reliable, productive machine with optimized components and a well-matched drive train
- Custom-made steam turbine with center admission designed precisely for the customer's needs
- Fully standardized, factory-wide automation system spanning all drive systems, energy switching and monitoring (ESM), and the steam turbine

Scope of supply

- Power distribution (PD): 220-kV GIS SWG, power transformers, 35-kV GIS SWG, 10-kV AIS SWG, distribution transformers, harmonic filters, DC systems, emergency power supply, SCADA system ESM/LMS, cable tray and cable routing, engineering and services
- Process electrification (PE): sectional drives including SIPAPER drive APL and SIPAPER winder APL, refiner motor (21 MW), MCCs, MV/LV VSDs, MV/LV motors, VD panel and UPS, cable tray and cable routing, engineering and services
- Process automation: latest generation 8.1 of the PCS7 process control system
- Steam turbine generator set SST 800: turbine SST 800 (EHNK 71/2,5 ax), generator SGen5-100A-2P, condenser SRC 27/32-2TSS ax power: 59 MW; speed: 3,000 rpm
- Service: implementation of additional remote diagnostic systems for the 21-MW refiner motor and steam turbine

Innovations for sustainable and future-proof processes



To stay competitive and increase the sustainability of its processes, the fiber industry can take advantage of a variety of innovations: for example, generating bio-based basic materials for the chemical industry. The fiber industry can also contribute to stabilizing the grid by supplying electrolyzers like Silyzer in the secondary control loop.

Power to gas (hydrogen)

In general, electrolyzers generate H₂ and O₂ at 35 bar pressure and low-temperature heat (60° Celsius). In the form of hydrogen peroxide H₂O₂, H₂ and O₂ can be used as bleaching agents. In contrast to chlorine-based bleaching, the disposal issue that comes with chlorine compounds has been eliminated. While H₂O₂ can be produced locally, chlorine most likely cannot due to its toxicity.

The byproduct O₂ can also be used to enhance combustion processes. And in conjunction with renewable energy systems, H₂ can be used in energy storage technologies. This is essential in autonomous energy systems as a back-up system if the main system fails (for example, hydro power), or to provide peak-load coverage.

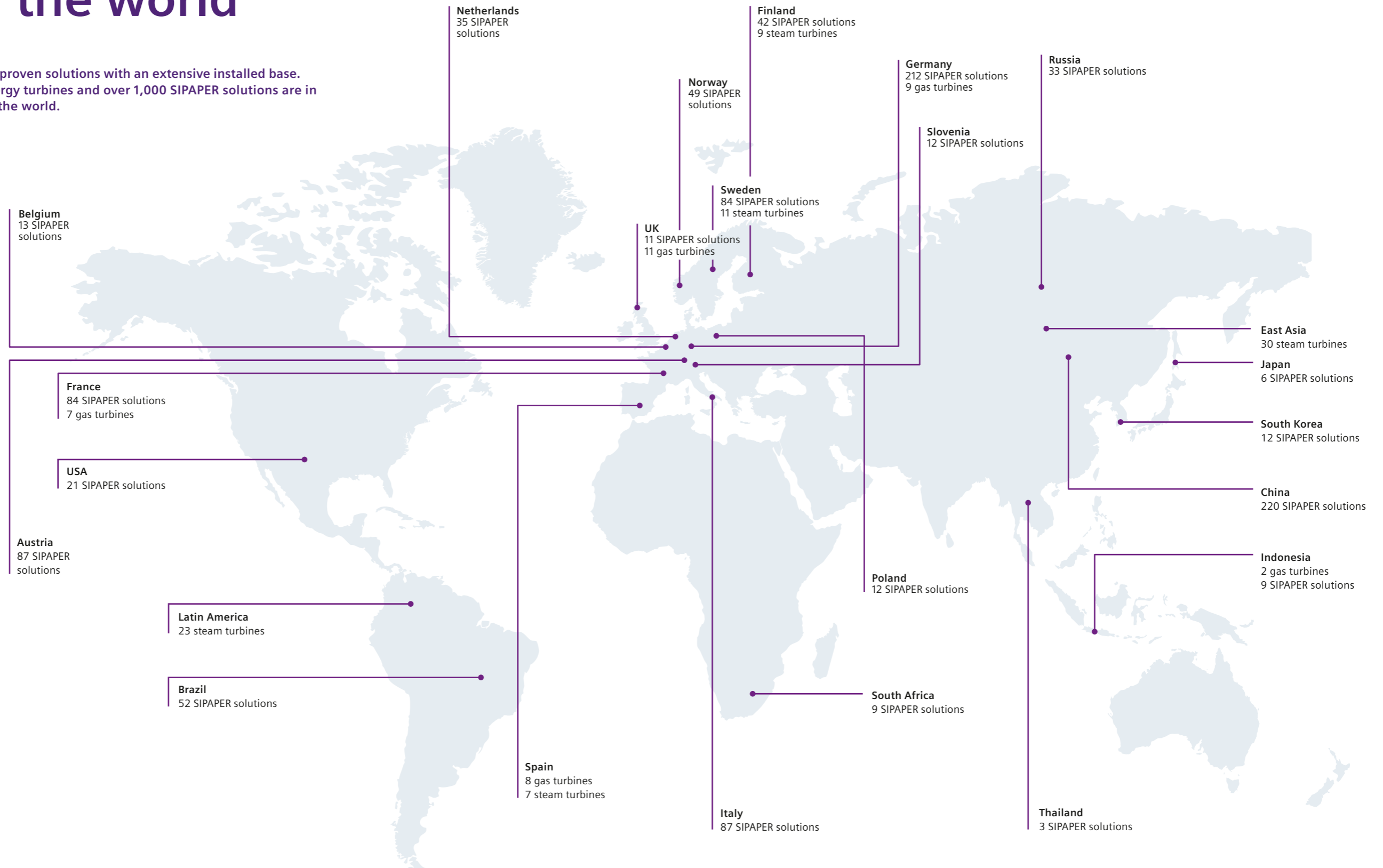
Silyzer 200 electrolyzer basic system

Electrolysis type / principle	Proton Exchange Membrane (PEM)
Rated stack power	1.250 kW
Dimension skid	6.30 m × 3.10 m × 3.00 m
Cold (black) start time	10 min
Start-up time (from standby)	< 10 sec
Operating temperature	60° C – 70° C
Ambient temperature	+2° C – +40° C
Output pressure	Up to 35 bar
Purity H ₂	99.5% – 99.9%; 99.999%*
Rated H ₂ production	21 kg / h; 225 Nm ³ / h
Weight per skid	17 t
Noise	≤ 65 dB (aAudio)
CE conformity	yes
Water consumption	1.5l / Nm ³ H ₂

*Depends on load; option

References from around the world

Our customers can rely on proven solutions with an extensive installed base. More than 170 Siemens Energy turbines and over 1,000 SIPAPER solutions are in operation in all corners of the world.



Published by

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