RESEARCH LOCATION AUSTRIA

Environmental Technologies & Renewable Energies

Austria*

*Strong Location for Environmental Technologies and Renewable Energies

All of Europe by Air in 3 Hours

Austria's central geographical location in Europe makes the country the East-West business interface.

Dynamic Business Location

As a business location, Austria offers companies attractive conditions, qualified specialized staff and a modern infrastructure. In particular eco-innovations are systematically supported.

Austria ranks among the most prosperous and innovative countries in the European Union. According to Eurostat's Prosperity Index, Austria is rated second in the EU behind Luxembourg. The dynamic business location stands out thanks to its modern infrastructure, high quality technologies, well trained and highly motivated specialized personnel. It also offers a high level of reliability with respect to the energy supply in addition to political, social and economic stability. In addition, Austria is considered to be the ideal East-West business interface in a central geographical location.

Austria is among the global leaders with respect to the share of renewable energies as a proportion of total energy consumption. Moreover, the country boasts a high security of supply and a well developed energy infrastructure. Austrian know-how in the field of energy and environmental technology is in demand worldwide. The development of eco-innovations is being provided with more support than ever before, for example thanks to broad-based research promotion and funding programs. In spite of this good positioning, we are continually working on creating an even more favorable business environment for companies.

Reinhold Mitterlehner
Vice Chancellor and
Federal Minister of Science, Research and Economy

Contents

5 Austria is the Frontrunner
6 Environmental Technology as a Growth Driver
7 EU Leader in Waste Management
8 Leading in Cleantech
9 Preserve and Recycle
10 Exploiting the Power of Water
12 Revolutionary Energy Supply
13 Strong Upwind
14 Solar Energy for the Future
16 "Living Labs" for Smart Technologies
18 12 % Research Premium and Attractive Tax Advantages
19 Active Research Landscape
20 Clusters as Innovation Drivers
21 Competence Centers – A Win-Win Proposition
22 Progress through Research
24 Exploit Market Opportunities

Imprint: Status: April 2015; Media owner and publisher: Austrian Business Agency, Opernring 3, A-1010 Vienna; Responsible for contents: René Siegl; Editorial team: Karin Schwind-Derdak (ABA), Maria Hirzinger (Connect U); Design: www.november.at; Photos: Richard Tanzer, BMWFW, Wilke - Das Fotostudio, Istockphoto, Verbund, Krischanz-Zeiller/AIT, Bigstock, TU Wien, GE Distributed Power, TU Graz, Foto-Höfinger; Printed by: Print City Europe

Global competence

Cleantech
- Waste and wastewater management
- Air pollution control
- Energy efficiency (green building, smart city)

Hydropower
- Turbines

Renewable energy
- Biomass boilers
- Heat pumps
- Solar heat
- Photovoltaic plants
- Bioenergy
- Wind energy

The big players

Companies
- Andritz
- BWT
- Fronius
- GE Distributed Power
- GREENoneTEC
- Siemens
- Voith Hydro

Research
- AIT – Austrian Institute of Technology
- AEE INTEC
- ASIC - Austrian Solar Innovation Center
- bioenergy 2020+
- ECO - Research Austria
- University of Applied Sciences Technikum Wien
- JOANNEUM RESEARCH

Austria is the Frontrunner

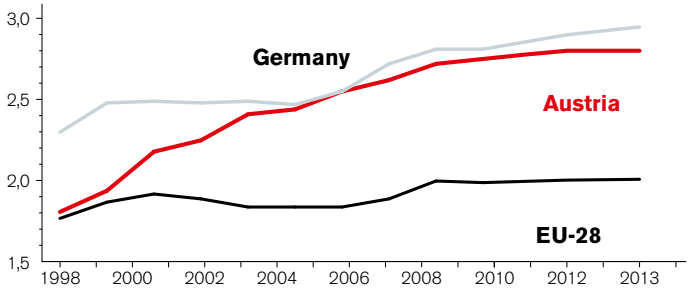
Ideal conditions for cutting-edge achievements in environmental technologies and renewable energies.

Companies as pioneers. Austria not only stands out due to its untouched natural environment and beautiful landscape, from the Alpine panorama to steppe lakes, but it is also an environmental role model with a highly developed industry in the fields of environmental technologies and renewable energies. Companies operating in Austria are trailblazers for water and waste management, and pioneers in technologies for generating bioenergy and in future-oriented areas such as sustainable building, ultra-lightweight vehicles and networked cities. The close link between the research and business communities in regional clusters and competence centers is an important pillar of the country's success.

All advantages are a glance. Outstanding achievements are only possible under favorable conditions.

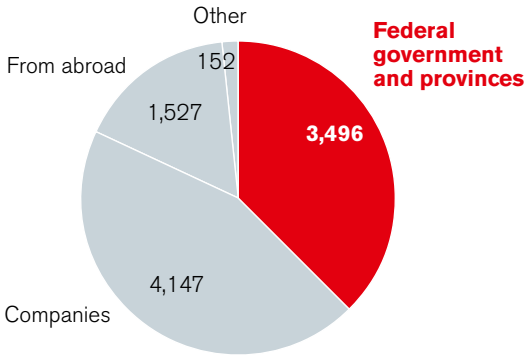
- Customized R&D funding and financing
- Twelve percent research premium (from 2016) and other attractive tax advantages
- A dense network of competence centers and industry clusters
- Qualified specialized employees and top-notch research institutions
- Forward-looking environmental regulations
- Outstanding living and working conditions

Development of R&D spending in Austria, Germany and the EU-28
% of GDP



Sources: Eurostat, Austrian Statistical Office, * from 2012 preliminary figure

Austrian investments in R&D
EUR million, estimates for 2014
Total R&D spending: EUR 9,322 million



Source: Austrian Statistical Office, 2014

Environmental Technology as a Growth Driver

Austria stands out thanks to the highly dynamic development of "green" patents and world market leaders.

Top rankings. Austria's innovative strength is reflected in its use of renewable energies, keeping its waters clean, waste management or organic farming and the highly dynamic development of "green" patents which far surpasses the OECD average. The Alpine Republic ranks among the top ten in all international environmental rankings. Austria is rated 7th in the Sustainability Ranking of Zürcher Kantonalbank, and the Environmental Performance Index 2014 Yale & Columbia University ranks Austria 8th in the world among 178 countries.

The strong environmental protection focus comprises the basis of disproportionately high growth and export rates of the environmental technology and renewable energy industry in Austria. This sector accounts for close to five percent of all employees but generates approximately twelve percent of total value creation. Sector revenue totals about EUR 36 billion (2012), and creates future-oriented jobs for some 174,000 people.

Leading companies. An impressive twelve percent of Austrian environmental technology companies are EU or global market leaders. Two thirds of revenue is generated on foreign markets.

Intact Environment
Ranking according to relevant climate and environmental protection indicators, Maximum = 100

Switzerland	1	87.67
Luxembourg	2	83.29
Australia	3	82.40
Germany	6	80.47
Austria	**8**	**78.32**
Netherlands	11	77.75
Great Britain	12	77.35
Italy	22	74.36
Japan	26	72.35
France	27	71.05
Hungary	28	70.28
Poland	30	69.53
USA	33	67.52
China	118	43.00

Source: Environmental Performance Index 2014

Success with renewable energies
10 = New technologies quickly bring competitive advantages

Denmark	1	8.17
Iceland	2	7.28
Germany	4	6.35
Austria	**5**	**6.2**
Switzerland	7	6.19
Spain	18	5.48
Netherlands	19	5.42
Great Britain	26	4.94
France	28	4.84
USA	31	4.82
China	35	4.54
Czechia	45	3.89
Brazil	54	3.30
Russia	58	2.06

Source: World Competitiveness Yearbook 2014

EU Leader in Waste Management

Secondary raw materials as a source for new technologies in recycling and thermal utilization.

Roland Pomberger,
Waste Processing Technology
and Waste Management,
Montan University Leoben

Austria has made a name for itself internationally in the field of waste and wastewater management. What are Austria's greatest strengths?

"Austria's waste management sector is demonstrably one of the most advanced, both in a European and international comparison. The latest EU ranking rated Austria and the Netherlands as number one in the EU on the basis of 40 indicators. Austria has a very high waste collection and recycling rate. Secondary raw materials i.e. raw materials from waste are becoming increasingly important for industrial companies. Technology-oriented firms specializing in recycling and thermal waste utilization and exporting technologies and processes have emerged."

What conditions do companies conducting R&D encounter in Austria?

"In particular, application-oriented corporate research is supported in many ways in Austria. Specific calls on current and strategic issues as well as research promotion programs without any thematic restrictions enable the development of new processes and products. The collaboration with universities of technology as project partners and contract researchers along with educational institutions training engineers and executives is very successful."

Can you name a particularly interesting research project in the field of waste and wastewater management?

"I would like to name three projects. 1. The development of a high quality recycling process for lithium-ion battery systems used in the field of e-mobility.
2. The LAMIS project focuses on old landfill sites as a source of raw materials.
3. "Waste fuels" can replace primary fossil fuels in cement plants. We are cooperating with international players such as Holcim, Lafarge and Cemex."

→ www.unileoben.ac.at

Leading in Cleantech

High degree of specialization in the fields of water management, air pollution control and recycling.

Water and wastewater management. A study carried out by ETH Zürich concludes that Austria has a high level of specialization in the field of cleantech patents. Austrian industry boasts more patent applications in relation to environmental technology patents in the water and wastewater segments than, for example, Germany and the entire EU. The Global Cleantech Innovation Index 2014 attests to the above-average number of patents in Austria as a strong driver of innovation. Wastewater treatment, which generates EUR 2.85 billion in revenue, is one of the most important economic factors in Austria's environmental technology business. The focus is on sewage sludge treatment.

Innovations from Austria

New energy from wastewater. An entire district in the German town of Straubing is supplied with energy from wastewater. Two heat pumps from the Austrian company Ochsner derive energy from wastewater in the sewage system and feed two networks with it supplying some 100 housing units with heating energy and warm water.

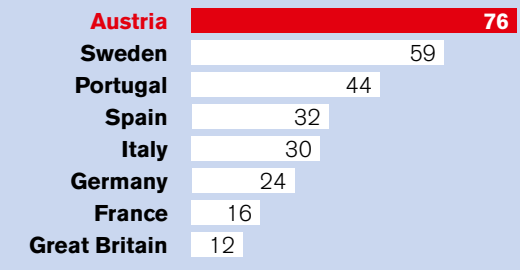
Sewage sludge purification plant with a combined heat and power plant. VA Tech Wabag, one of the global leaders in the field of water treatment, is building a municipal wastewater treatment plant in Saudi Arabia. The anaerobic sludge treatment and the generation of electricity in the combined heat and power facility (cogeneration plant) ensure that the wastewater purification plant can generate half of its own electricity needs.

Water and wastewater management – Hidden champions*

Andritz	proaqua
BWT Group	SFC Gruppe
Hans Künz	VA Tech Wabag
Hydrip	WD Austria
inowa	WDL
Meisl	

* This list is not exhaustive.

Share of renewable energies in electricity production
In percent, 2012



Source: Österreichs Energie, Eurostat

Preserve and Recycle

Innovative technologies to keep the air clean complement an internationally exemplary recycling industry.

Air pollution control and climate protection. According to ETH Zurich, Austria's strength can be demonstrated by a level of patents in this field which is higher than the EU average. Air pollution control and climate protection comprise an important economic sector, accounting for about 15 percent of all employees in the field of environmental technologies. The priorities of the air pollution control segment are filter and catalytic aftertreatment systems and thermal afterburning processes.

Exemplary recycling. Austrian recycling and materials flow management are internationally respected as being exemplary in many areas. Austria is the leader in waste management next to the Netherlands, according to the study "Screening of Waste Management Performance of EU Member States" published by the EU Commission. The distinctive feature is the development of holistic solutions, from waste collection, treatment and thermal waste utilization to the fermentation and composting of waste materials.

Innovations from Austria

Odorless and dust-free industrial plants. Lenzing Technik shows how exhaust air can be biologically purified at Tyrolit Schleifmittelwerke. The patented BIOReaction process serves to efficiently remove hydrocarbons and the odors arising from the production of abrasive tools.

Pet recycling using fungi. The Austrian Centre of Industrial Biotechnology (ACIB) developed a new type of "natural" process enabling plastics to be completely degraded into their individual components with the help of fungi.

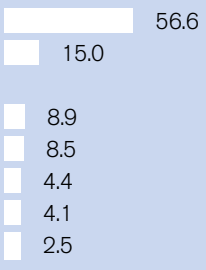
Recycling – Hidden champions*

Binder+Co	Austria	SW Umwelttechnik
Brandtner	Redwave	Thöni
Denios	Rubble Master	UFH Recyling
Inergeo	Saubermacher	Untha
MBA Polymers	Stummer	

Air pollution control – Hidden champions*

Andritz	drexler und weiss	LHS Austria
CTP	Kappa	Scheuch

Employees in the environmental sector
In percent



* This list is not exhaustive.

Source: Statistics Austria, 2012

Exploiting the Power of Water

Bubbling expertise for hydropower plants and turbines – Hydropower is Austria's top source of energy.

Austria is in the top ranks internationally, with hydropower generating about 60 percent of its electricity compared to the global average of 16 percent. The Alpine Republic boasts 150 large and more than 3,000 small-scale hydropower stations, giving it an internationally sought-after expertise in the planning, construction and operation of hydropower plants. Austria is a leader in the manufacturing, installation and maintenance of plant components such as turbines.

Know-how exports. In addition to the use of biomass, hydropower is the most important economic sector in Austria in the field of renewable energies. The country relies on exports in light of the fact that Austrian know-how is in demand, especially in its South East and Eastern European target markets such as Hungary, Czech Republic, Slovakia and Slovenia.

Innovations from Austria

Soft hydropower turbines. The company Aqua Libre developed a hydropower turbine integrated into a buoy installed in waterways or in the sea which continuously produces electricity. It only uses the kinetic energy of the water flows without endangering flora, fauna or shipping.

From small to large hydropower plants. Andritz Hydro supplies the electromechanical equipment for a hydroelectric power station in Angola and turbines for a tidal turbine park in Scotland driven by the ebbs and flows. The company is one of the world's leading suppliers of hydropower plants.

Hydropower / Turbines – Hidden champions*

Alstom Austria
Andritz Hydro
EFG
Geppert
Global Hydro Energy
Gugler Water Turbines
Hydroconnect
Kössler
Voith Siemens Hydro

*This list is not exhaustive.

"KWB has defined the target of launching one innovation on the market-place each year. In order to ensure that this happens, we operate the largest research and development center for biomass in Europe today. In addition, we are also intensively pressing ahead with our efforts to enhance the comfort and environmental performance of our products on the basis of research projects. In this regard we work with Austrian research centers such as Bioenergy 2020+ as well as with international institutions such as the Fraunhofer Institute and the German Aerospace Center."

Erwin Stubenschrott, CEO KWB Biomass Heating

Revolutionary Energy Supply

Austria is leading in renewable energies - two thirds of German biomass furnaces are “Made in Austria”.

The EU has set a goal of increasing the share of energy from renewable sources to 20 percent by 2020. In contrast, Austria already reached 31 percent in 2010 and expects to achieve a level of 34 percent by 2020. In addition to hydropower, the most important renewable energy source in Austria is biomass, with a share of over 45 percent.

Booming biomass. Austria has achieved technology leadership in the field of small biomass boilers as well as the development of marketable small and micro-cogeneration systems. The export rate is 70 percent. Two thirds of the installed biomass furnaces in Germany come from Austrian producers.

Focus on heat pumps. Current research concentrates on combining heat pumps with other energy technologies such as solar thermal energy and photovoltaics as well as a combination of heating and cooling or drying out buildings.

Innovations from Austria

Biogas storage tanks from special textiles. Sattler, a company specializing in storage concepts for biogas, liquid manure and fermentation residues, constructed the world’s largest storage facility for biogas from a sewage treatment plant in Mexico.

Electricity and heat from olives. The Vienna University of Technology and Repotec are carrying out research on next generation biomass facilities designed to generate electricity and heat from olive pressing residues.

Bioenergy – Hidden champions*

Alstom Austria	GE Distributed P.	Sattler
Andritz	Komptech	Siemens
BDI	KWB	Thöni
Cimbria	Ortner	Urbas
Fröling	Repotec	Viessmann

Heat pumps – Hidden champions*

Buderus	Heliotherm	M-Tec
IDM Energiesys.	Ochsner	Weider

*The list is not exhaustive.

Alternative energy sources on the rise
Use in number of households

	2003/2004	2011/12
Black coal	36,097	18,597
Brown coal	16,685	4,638
Brown coal briquettes	41,504	27,047
Coke	54,863	21,810
Wood	889,193	1,238,094
Pellets, wood briquettes	66,923	240,657
Wood chips	33,328	62,868
Solar heat	156,961	392,276
Heat pumps	85,794	220,362

Source: Statistics Austria

Strong Upwind

The component supplier industry trumps thanks to high growth rates.

Wind turbines rotate in Austria. The wind power sector demonstrates its strengths in the manufacturing of system components such as control system, rotor blade materials, generators, wind power plant design and steel for tubular towers of wind turbines, high tech materials and services. The industry has been on a steep growth curve of between 22 and 25 percent in recent years.

World champion in supplying components. A control system from Bachmann electronic in Austria can be found in every second wind turbine operating around the world. The wind power facilities of the Chinese market leader Sinovel are based on concepts developed by the Austrian firm Amsc Windtec. Austria has become an indispensable partner for example in manufacturing cranes for the construction of offshore wind power plants.

Innovations from Austria

First electricity self-sufficient region in Europe. Burgenland has been self-sufficient in wind energy since the middle of 2013. One high-performance facility is being operated as a research station in cooperation with the German company Enercon in order to increase the efficiency and productivity of wind power plants.

Wind park management. Windkraft Simonsfeld is the largest service provider for technical operations management in Austria, with responsibility for about 150 wind power plants in Austria and Bulgaria.

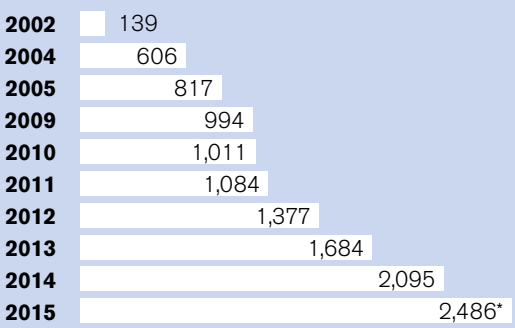
Wind power – Hidden champions*

Amsc Windtec	Leitwind
Bachmann electronic	Liebheer
Elin Motoren	Palfinger
Enercon	RED Bernard
Exel Composites	SKF
Hainzl	TTTech
ILF	

*The list is not exhaustive.

Wind power is booming

Expansion of wind energy in Austria – Total output in MW



Source: Austrian Wind Energy Association, *Forecast

Solar Energy for the Future

High export rates characterize the photovoltaic and solar thermal energy sectors.

Leader in solar thermal energy. Austria is one of the European leaders in producing solar thermal power, boasting a collector area of about 1.13 million square meters. The export rate of 81 percent for thermal collectors illustrates the level of international demand for Austrian products. There are also new developments in the fields of plastic solar panels, heat accumulators and building integration.

High growth. The photovoltaic industry, which is a very research-intensive sector, shows the highest growth rate in the field of renewable energies in Austria. R&D accounts for every tenth job. Austria's core strengths are PV cells, inverters and tracking systems. Austria also takes unconventional paths: The nuclear power plant in Zwentendorf was never put into operation due to a national referendum, but the facility is now one of Austria's largest PV facilities and a research center.

Innovations from Austria

Bionic absorbers. Sun Master was inspired by nature in developing a new generation of solar collectors. The transfer of heat takes place directly on the absorber plate through canals, which branch out like the leaf of a tree. This leads to the optimal heat transmission and a higher output.

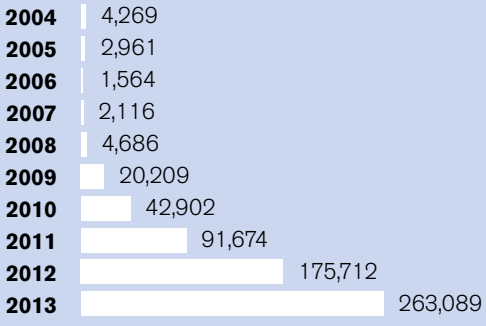
SolarCampus as Austria's largest solar power plant. The photovoltaic research power plant in Upper Austria features a solar collector area of about 8,000 m², or almost as big as two football fields. In addition, Fronius constructed a smart grid demonstration network.

Photovoltaics/Solar technology – Hidden champions*

3F Solar Technologies	Kioto
AST	Laserdata
ATB Becker	Plansee
Crystalsol	Olymp Werke
Ecoduna	Siko
Ertex	Solid
Fronius	Sunplugged
GREENoneTEC	Tisun
Helioz	WAF Fassadensysteme
IBC Solar	Welser Profile
Isovoltaic	

*The list is not exhaustive.

Bright prospects for photovoltaics
Annually installed photovoltaic output in kWpeak



Source: Austrian Ministry for Transport, Innovation and Technology, Reports on energy and environmental research 26/2014

Innovations from Austria

World's largest solar thermal plant. The largest solar thermal plant in the world located at the University for Women in the Saudi Arabian capital of Riyadh with the know-how and technology supplied by GREENoneTEC and the research institute AEE Intec. The solar collectors supply warm water for up to 40,000 students and also serve to heat the university campus „Princess Noura Bint Abdulrahman". The solar collectors at the solar power plant cover an area of 36,305 m^2.

Doris Österreicher
Head of Business Unit
Sustainable Buildings and
Cities, Energy Department, AIT
Austrian Institute of Technology

"Living Labs" for Smart Technologies

Austria is a pioneer in "green building" and "smart cities".

The Smart Cities Index of the American climate strategist Boyd Cohen ranks Vienna third, standing out on the basis of more than 100 smart city projects. Smart tramways in Linz, the world's first plus-energy office building in Vienna with energy savings of up to 90 percent and sophisticated skyscraper facades ensuring perfect room temperature are several of the internationally acclaimed showcase projects.

You are developing solutions for a sustainable energy system at AIT in cooperation with an international team. Could you give a practical example?

"The research carried out at AIT focuses on the "electrical energy infrastructure" and "energy for a built-up environment, to name two examples. Comprehensive solutions are being developed for an environmentally compatible electricity supply, heating and air conditioning of the buildings and cities of tomorrow. In the project "Transform", the AIT Energy Department is developing a decision support tool (energy atlas) designed to analyze which measures are required in selected districts or individual types of buildings."

What makes Austria a trailblazer?

"Research and development are key pre-requisites for transforming cities into smart cities. The intelligent city of the future requires new business models, new services such as Apps or mobility services, and above all new energy and transport infrastructure models. Smart cities are innovative cities serving as "living labs" for smart technologies and infrastructure solutions."

→ www.ait.ac.at

Green Building – Hidden Champions*

Cree
Eder Ziegelwerk
Elk
Freisinger Fensterbau
Holzbau Wegscheider
Hartl
Isocell
Isover Rehau
Lisec
Leyer-Graf
Rubner
Schafferer Holzbau
SFL Technologies
Steinbacher Dämmstoffe
Technopor
Velux
Vogel&Noot
Wienerberger
Wopfinger
XAL
Ytong

*The list is not exhaustive.

Smart Cities in 2014
Index for Innovation and Sustainability

1	Copenhagen
2	Amsterdam
3	Vienna
4	Barcelona
5	Paris
6	Stockholm
7	London
8	Hamburg
9	Berlin
10	Helsinki

Source: Smart Cities Index Europe 1014

Innovations from Austria

Intelligent electricity networks. The research institution JOANNEUM RESEARCH works with partners from Greece, the Netherlands and Slovenia and within the context of the EU project INCREASE on the optimization of intelligent electricity networks in order to reach the EU's targeted share of 20 percent of energy derived from renewable energy sources by 2020.

Batteries for electric and hybrid vehicles. Magna Steyr Battery Systems equips electric-powered and hybrid vehicles with batteries. A factory near Graz, Austria develops batteries for electric and hybrid vehicles on behalf of several international producers. For example, the Porsche 918 Spyder is equipped with particularly light but powerful 12-volt batteries to operate the vehicle's electrical system.

12 Percent Research Premium and Attractive Tax Advantages

Whoever carries out research pays lower taxes – and profits from numerous funding programs.

Research and even more research. Austria has established a research-friendly business environment thanks to tax advantages and funding programs. The research premium will be raised to twelve percent in 2016 and can be deducted for a company's own R&D as well as contract research serves as an innovation turbocharger for companies in the environmental technology sector.

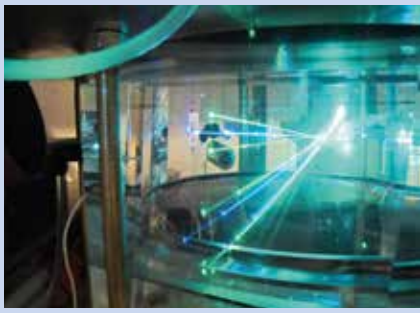
Tax advantages and financing. Moreover, the Austrian tax system lures investors with the tax-exempt apprenticeship allowance, tax loss carryforwards and the possibility to transfer hidden reserves. The corporate income tax rate is a company-friendly 25 percent, whereas the net worth and trade taxes are not levied in Austria. Österreichische Kontrollbank (OeKB) and export funds also provide favorable financing opportunities.

Broad-based research funding. Customized R&D research programs from the Austrian Research Promotion Agency (FFG), Austria Wirtschaftsservice (aws) or the Austrian Science Fund (FWF) are available to companies conducting research. Specific funding initiatives are also offered in some federal provinces.

Special funding programs for the environmental sector. The Federal Ministry of Agriculture, Forestry, Environment and Water Management also makes funding available in the fields of environment and energy, for example its program klima:aktiv. The Sustainable Management stimulus program initiated by the Federal Ministry of Transport, Innovation and Technology offers attractive incentives focusing on enhancing energy efficiency. Kommunalkredit Public Consulting (KPC) manages funding and energy programs and offers consulting on international projects. More than 1,000 innovative projects are being implemented in more than 100 climate and energy model regions.

Funding:
→ www.ffg.at
→ www.awsg.at
→ www.fwf.ac.at
→ www.bmwfw.gv.at
→ wwww.bmvit.gv.at
→ www.klimaaktiv.at
→ www.nachhaltigwirtschaften.at
→ www.klimafonds.gv.at
→ www.public-consulting.at
→ www.foerderkompass.at

Active Research Landscape



Qualified employees enjoy an education of the highest quality level at higher technical schools and universities.

High research expenditures. Expenditures on energy-related research in Austria rose fourfold to EUR 124.5 million annually in the period 2007 to 2013. On average, the environmental sector invests more in R&D than other Austrian industries.

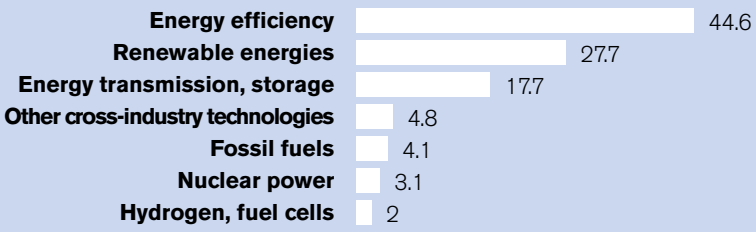
Universities as strong partners. In addition to universities, more than 50 non-university research institutions serve as partners to the corporate sector. International research teams develop innovative solutions, from flexible photovoltaic films to reliable parking Apps, thus providing a decisive competitive edge.

Research institution	Focal points in the field of environmental technology
AIT - Austrian Institute of Technology	Smart grids, PV, thermal energy systems, smart regions, smart buildings, complex energy systems, mobility
JOANNEUM RESEARCH	Green photonics, smart technologies, resource management
AEE – Institute for Sustainable Technologies (AEE INTEC)	Solar thermal energy, sustainable buildings, industrial processes and energy systems
ASIC - Austrian Solar Innovation Center	Collectors, solar thermal energy, photovoltaics, energy management
University of Applied Sciences Technikum, Vienna	Solar thermal energy, photovoltaics, smart grids, wind power, mobility, smart city

→ www.tuwien.ac.at
→ www.tugraz.at
→ www.boku.ac.at
→ www.mci.edu
→ www.uibk.ac.at
→ www.uni-salzburg.at
→ www.ait.ac.at
→ www.joanneum.at
→ www.aee-intec.at
→ www.asic.at

Reservoir of top employees. Besides the higher technical schools, universities as well as eleven post-graduate educational programs in the field of environmental technology and renewable energies ensure a sufficient pool of qualified employees.

Energy research expenditures
In percent, 2013



Source: Austrian Ministry for Transport, Innovation and Technology, Energy R&D Survey 2013

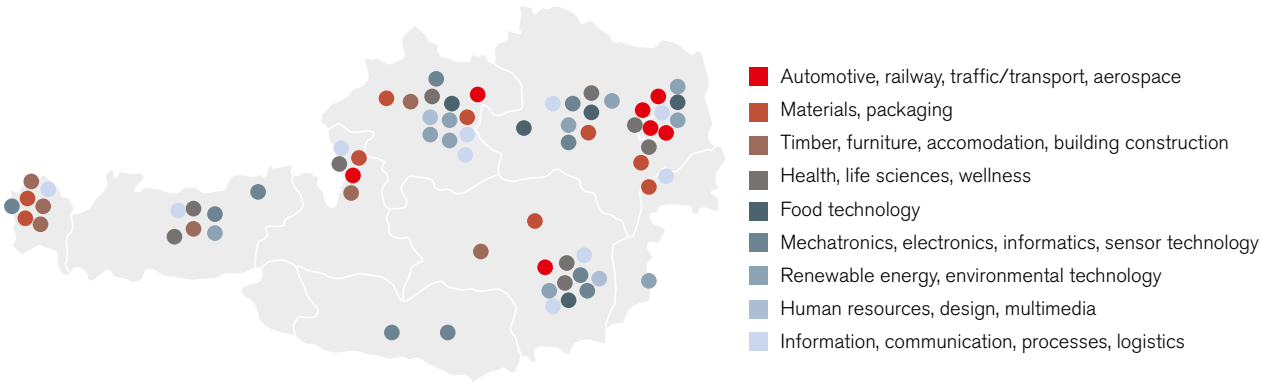
Clusters as Innovation Drivers

Well-networked companies leverage synergies and have emerged as a driving force for new developments.

More than 60 industry clusters. These cluster players are characterized by internationality and a high research ratio averaging 7.5 percent. Specialized firms cooperate with each other and with research institutes or talented scientists. ECO WORLD STYRIA was already twice named the world's best environmental technology cluster (2010 US Cleantech Group, 2012 Global Cleantech Directory).

Cluster	Focal points
Upper Austria: Eco-Energy Cluster, Environmental Technology Cluster, Network Resources and Energy Efficiency	Energy efficiency
Styria: ECO WORLD STYRIA	Wastewater and waste management, recycling, plant construction and mechanical engineering
Lower Austria: Construction.Energy. Environment Cluster, Technopol Tulln	Energy-efficient buildings, ecological building materials, biotechnology
Vienna: E.C.E.X.A., Environmental Cluster Vienna	Waste management, energy-efficient construction, environmental monitoring and water purification
Tyrol: Cluster Renewable Energies	Energy efficiency
Burgenland: Austrian Water	Water supply and wastewater disposal

Clusters and networks
in the Austrian provinces and supraregional initiatives



Source: Cluster Platform Austria 2014

Competence Centers – A Win-Win Proposition

Strategic partnerships between the business and research communities comprise Austria's success model.

More than 50 competence centers. One of the most successful Austrian funding initiatives is COMET, which stands for Competence Centers for Excellent Technologies. COMET promotes the cooperation between industry and sciences, and offers companies the advantage that they do not have to individually submit applications for all projects.

From algae to slaughterhouse waste. The K1 competence center BIOENERGY 2020+ carries out intensive research on new fuels and energy generation systems at its sites. The research centers have extensive competencies ranging from combustion and thermal gasification to new types of simulation models, such as a virtual biogas facility.

European center for renewable energies. The pioneering Güssing region in Burgenland has been energy self-sufficient since 2001 thanks to its biomass district heating plant, biodiesel plant and biomass power plant. By means of steam gasification, various fuels (different forms of biomass and household waste) can generate electricity, heat, biogenic natural gas as well as diesel, kerosene and hydrogen. At the same time, a research center for renewable energies was set up on the basis of international know-how transfer.

Risk management. In its role as a non-university research center, the Innsbruck-based alpS K1 Center is conducting research focusing mainly on the risks and opportunities of climate change, and adjustments to climate change made in mountainous areas. The objective is to develop sustainable strategies and technologies for the Alpine region.

Early adaptors. Sinfonia, one of the biggest smart city initiatives in Austria, is being implemented within the context of the EU initiative "European Smart Cities and Communities" with the primary objective of increasing the energy efficiency of European cities, and is supported by alpS. Successful technologies from the pioneering cities of Innsbruck, Austria and Bolzano, Italy will be installed in five other "early adaptor" cities in Europe in the future. New energy should be generated, for example, from the drainage water of the Brenner Base Tunnel as well as from industrial wastewater and sewage treatment plants.

Stephan Laiminger,
Engineering Manager,
GE Distributed Power

Progress through Research

Next generation engines are developed in Austria on the basis of intensive research partnerships.

How are conditions in Austria conducive for GE Jenbacher to carry out research and development on gas engines and combined heat and power plants?

"The increasing level of energy generated by wind power and solar energy raises demand for energy generated in a decentralized manner for network stabilization purposes. Jenbacher gas engines of GE are optimally suited for this. Another trend is the liberalization of the gas market, which in turn leads to strong quality fluctuations in the gas network. Gas engines must be continuously upgraded in both areas and adapted to reflect new requirements, which presupposes intensive research on the fundamental premises underlying engine technology. One can count on outstanding research facilities here in Austria. We cooperate with UMIT in Hall, Tyrol and the Vienna University of Technology on issues relating to control engineering. When it comes to materials, the first place we turn to is Montan University Leoben, and with respect to combustion methods, we cooperate with the Graz University of Technology."

Business meets science

The successful collaboration with the Institute of Internal Combustion Engines and Thermodynamics of the Graz University of Technology in the development and further development of combustion methods goes back a good 20 years. Within the context of this research cooperation, engines could be significantly improved, and numerous new combustion processes for special gases were developed. In order to further intensify this partnership in the coming years, GE Jenbacher are intensively involved in the research program of the COMET K1 center LEC EvoLET in Graz together with other industrial partners. In addition to the Graz University of Technology, other scientific partners of this competence center include Montan University Leoben and research institutes in Spain and Japan.

New engines and applications. GE Jenbacher developed a completely new type of engine featuring a new record level of efficiency, supported by research results achieved in cooperation with the Graz University of Technology. Researchers from the Large Engines Competence Center (LEC) laid the groundwork for this engine based on an optimized design of the combustion process. The finished engine precisely fulfilled the performance parameters forecast in the simulation, enabling the company to considerably shorten the product development cycle.

→ www.gejenbacher.com

"Successful innovations arise today on the basis of successful cooperation models. The selection of a partner and the shaping of the collaboration become a core competence. Our longstanding partnership with GE Distributed Power in the field of efficient large engine technologies is a prime example of successful innovation cooperation and the optimal interaction of science and business".

Andreas Wimmer, Managing Director Large Engines Competence Center (LEC), Graz University of Technology

Josef Gaschl,
Managing Director Voith Hydro

Exploit Market Opportunities

The know-how and quality of Austrian power plant operators open up business opportunities for Voith Hydro in Eastern Europe.

As a supplier for hydropower plants, Voith Hydro is very active on Eastern European markets. What conditions exist in Austria to support your CEE business and drive research and development?

"Voith ranks among the world's leading full-service providers for hydropower plants. The offering ranges from individual components to new, turn-key facilities. The company continuously optimizes its product portfolio thanks to intensive investments in research and development. The St. Pölten site within the Voith Hydro Group is responsible for the Austrian market as well as for South East and Eastern Europe, Russia, CIS and the Middle East. All common types of turbines and pumps and the corresponding turbine controllers are produced here.

Generally, Voith Hydro St. Pölten is strongly oriented to Eastern European markets. Austria offers the ideal pre-requisites due to its historical ties and the strength of Austrian banks in CEE. The know-how and technical standards of the large Austrian power plant operators, well-known beyond the country's borders, are also crucial to our success."

Business meets science

In addition to the economic environment, Voith Hydro also requires well-trained technical staff at all qualification levels. In this regard, the company can rely upon functioning partnerships with technical research and educational institutions such as the Vienna and Graz Universities of Technology. Projects are exclusively awarded to Austrian research facilities in coordination with its centralized research and development department in order to press ahead with the optimization of VOITH Hydro's technologies.

Storage technologies of the future. For example, the COMET K project GreenStorageGrid implemented with the Vienna University of Technology focuses on networks and storage technologies. More specifically, it investigates how thermal, chemical and hydraulic storage devices can function and be optimized in direct relation to network requirements.

→ www.sanktpoelten.voith.com

"Cooperation projects comprise a central pillar of Austria's research landscape. Companies and universities are linked based on their common interest in introducing young researchers to their later working environments in industry. At the same time, specific research projects such as the COMET-K project GreenStorageGrid give young scientists the flexibility they need to carry out basic research work."

Christian Bauer, Vienna University of Technology

ABA – Invest in Austria offers comprehensive services – competent consulting on selecting a business location, support in contacts with public authorities and funding bodies as well as on labor and tax issues and in the search for cooperation partners. And it does so free of charge.

Best Consulting on Business Location Issues

ABA – Invest in Austria is the investment promotion consulting company of the Republic of Austria and the top choice of international investors.

- **Experienced investment consultants** personally serve you and provide all the necessary contacts required in Austria. Contact us at the beginning of your expansion project so that you will be given optimal support.
- ABA – Invest in Austria offers **customized information** on Austria as a business location – sectors, technologies and markets, political and economic conditions.
- We are happy to advise you on important issues relating to **site selection** such as labor and tax regulations, incentives or real estate prices.
- Employees of ABA – Invest in Austria assist and support you in **handling formalities** such as applying for public funding or operating licenses – also in cooperation with the regional investment promotion agencies in the federal provinces.
- ABA – Invest in Austria also provides extensive services to support expansion investments **after project completion.**
- Investors can also benefit from the cooperation partners within the **international network** of ABA – Invest in Austria and the foreign trade centers of the Austrian Federal Economic Chamber.
- **Award-winning ABA.** ABA – Invest in Austria has won several awards for its consulting services: World's Best Investment Promotion Agency, World Bank Benchmarking (2009); Global Leader in Online Investment Promotion, World Bank Benchmarking (2012); Second-Best Investment Promotion Agency and third-place award for its program to strengthen Austria as a headquarters location, FDI World Forum (2013).
- **Specialized brochures.** More detailed information on different topics and industries can be found in numerous specialized brochures such as:

- Business Location Austria
- Bridge between East and West
- Automotive Industry
- Chemistry / Plastics
- Environmental technologies & renewable energies
- Headquarters Location Austriar
- ICT / Telecom
- Life Sciences
- Logistics
- Machinery / Electronics / Mechatronics
- Research & Development
- Tourism
- Starting Business in Austria
- Tax aspects of investments in Austria

In Austria:

ABA – Invest in Austria
Opernring 3
A-1010 Vienna
Tel.: +43-1-588 58-0
Fax: +43-1-586 86 59
E-Mail: office@aba.gv.at

Internet:

www.investinaustria.at
www.investinaustria.cn
www.investinaustria.ru
www.investinaustria.jp