Bundesministerium
Land- und Forstwirtschaft,
Klima- und Umweltschutz,
Regionen und Wasserwirtschaft

Location Presentation

Performance and Innovation Capacity of Austrian Environmental Technologies

IFAT Munich 2026

Austria: Location and Key Figures

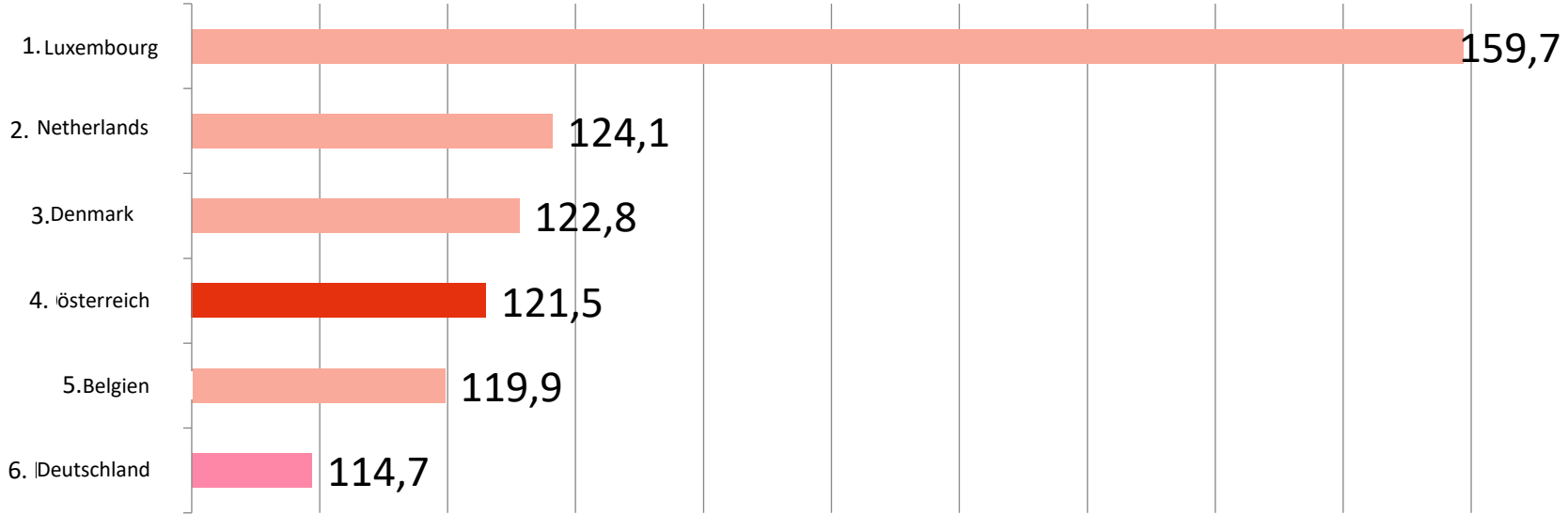
- 9.2 million inhabitants
- Area 84,000 km²
- Republic with 9 federal states

Photo: stockphoto

Austria: Land of majestic mountains, clean air, clear water, music and environmental technology

Salzburg, photo: Wolfgang Zimmel

Living Standards in the EU



Source: EUROSTAT, Living Standards in the EU: Consumption per inhabitant, as at 25 February 2025

Global Leadership Position in Environmental Performance Ranking by Yale & Columbia University 2024

COUNTRY	RANK	SCORE	10Y Δ
Estonia	1	75.7	17.6
Luxembourg	2	75.1	4.2
Germany	3	74.5	4.6
Finland	4	73.8	8.3
United Kingdom	5	72.6	2.1
Sweden	6	70.3	1.6
Norway	7	69.9	3.7
Austria	8	68.9	-0.3
Switzerland	9	67.8	2.0

"Overall Environmental Performance Ranking":

8th place out of 180 countries assessed

58 performance indicators across 11 thematic categories

1st place in the categories:

- "Adjusted emission growth rate for nitrogen oxides"
- "Adjusted emission growth rate for sulphur dioxide"
- "Collected wastewater"
- "Reused wastewater"
- "Adjusted emission growth rate for black carbon"

Screenshot and source: https://epi.yale.edu/measure/2024/epi, as at 25/02/2025

Magnificent nature through strict environmental legislation and strong environmental commitment

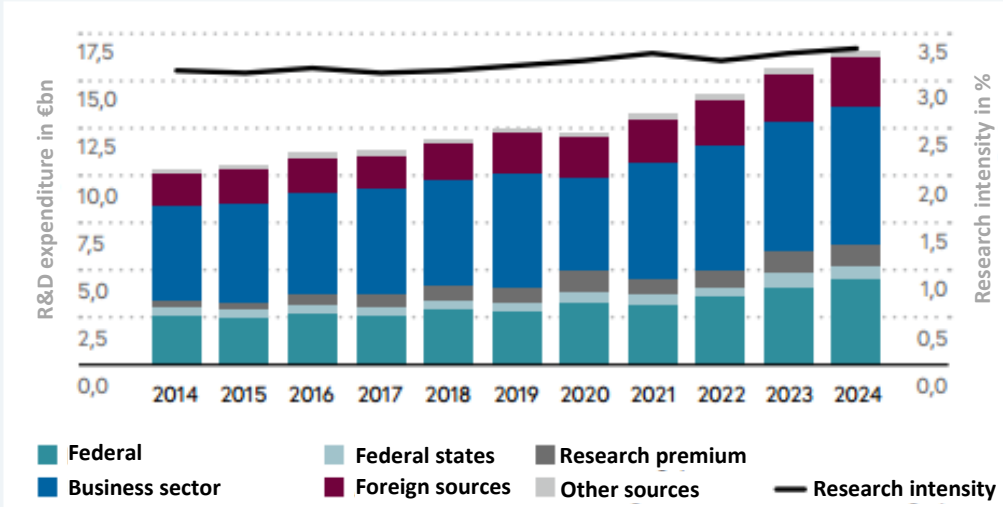
Unrivalled quality of life in Austria for several years

Vienna is the second most liveable city in the world

Source: IMD World Competitiveness Yearbook, 2024, accessed via ABA

Financing of Research & Development

Financing of R&D conducted in Austria and development of research intensity 2014-2024



Source: Factsheet 2024, Austrian Research and Technology Report, January 2024

- Constant increase in R&D financing
- Research intensity of 3.35 % in 2024
  – higher than ever before
- Austria outperforms the European target of 3 % for the 11th time

"Strong Innovator" in EU Comparison

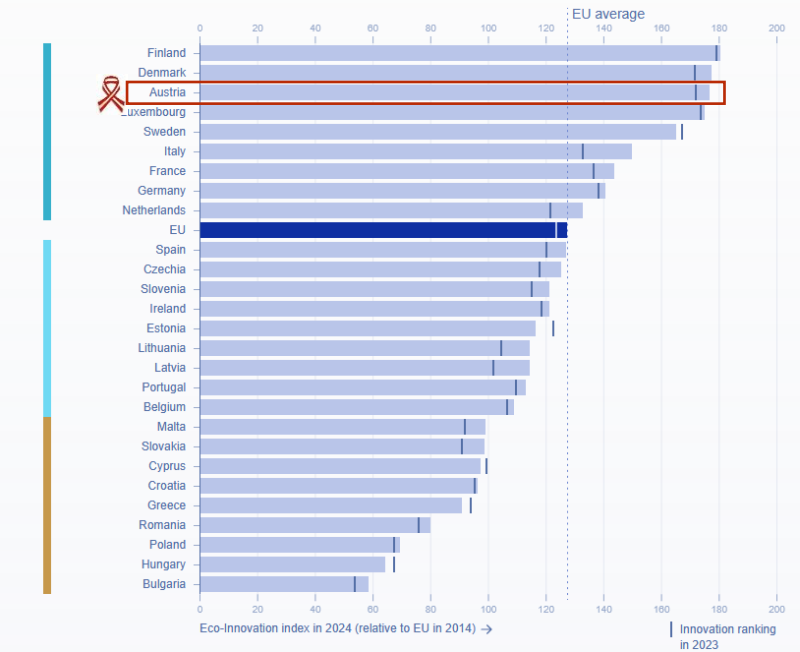
European Innovation Scoreboard - 8th place

"Strong Innovators" Group – 3rd place

Lead in "intellectual property" patents, trademarks and designs measured against GDP

Source: European Commission, European Innovation Scoreboard 2024

Austria is an Eco-Innovation Leader



5 Dimensions

- Eco innovation inputs
- Eco innovation activities
- Eco innovation outputs
- Resource efficiency
- Socio-economic results

Source: European Commission, Eco Innovation Index 2024, as at 25 February 2025

European funding supports leading-edge research

ERC Grants
per million inhabitants, 2022

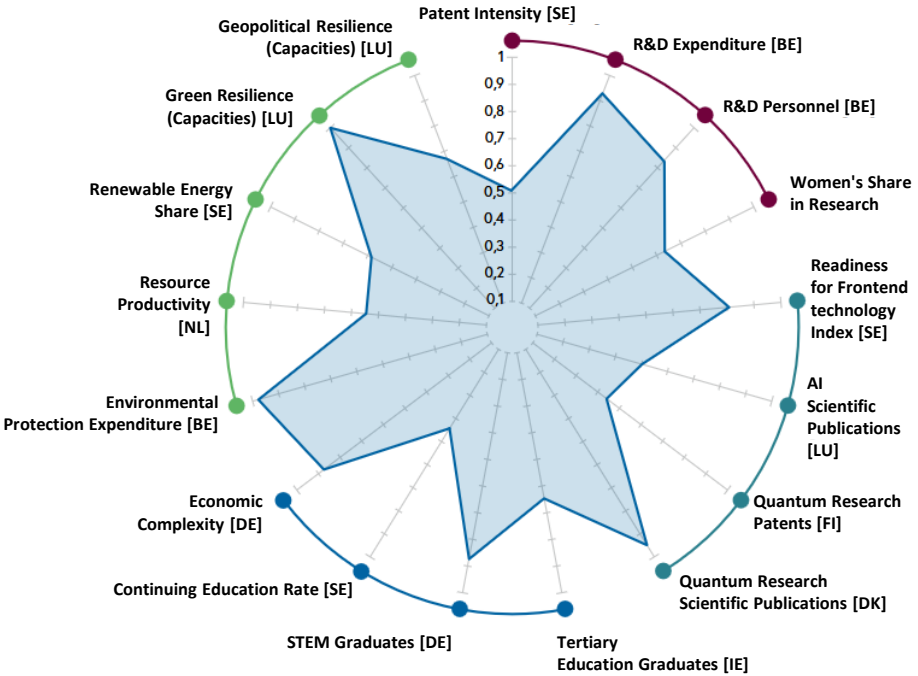
Quelle: EU-Performance Monitor der FFG (2024) zum Datenstand 1/2024.

Source: Austrian Research and Technology Report, BMBWF, 2024

Austria's Innovation Capacity

- Performance Indicators in R&D
- Digitisation Status Indicators
- Innovation Capacity Indicators
- Ecological Sustainability and Resilience Indicators

Reference value 1 corresponds to the peak value of leading nations.



Source: Austrian Research and Technology Report, BMBWF, 2024

Environmental Legislation & Targeted Promotion of Innovative Environmental Technologies

Leading Position in Development, Deployment and Export of Innovative Environmental Technologies

Further securing and strengthening this position through:

- Targeted export promotion
- Research and qualification measures
- Grants and financing
- Strengthening the domestic market

Photo: BMLUK / Alexander Haiden

Photo: BMLUK / Alexander Haiden

Photo: Saubermacher, pixelmaker

Photo: HBT Energietechnik

Photo: Designed by freepik

Strong initiatives for the economy and the environment

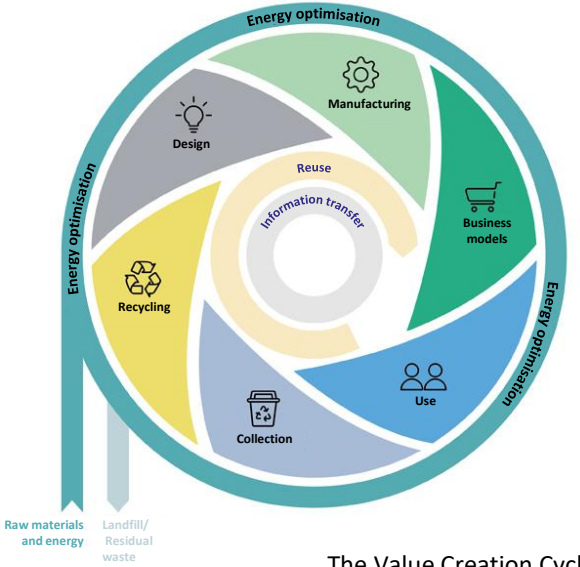
Kufstein, Tyrol, photo: Duernsteiner from pixabay

- **Strategic initiatives**
  - Federal Government's climate neutrality targets
  - Environmental Technologies Masterplan
  - RTI Initiative on circular economy
- **Awareness-raising initiatives**
  - klimaaktiv climate protection campaign
  - State Prizes including environmental and energy technology / architecture and sustainability / smart packaging
  - Austrian ecolabel
  - EMAS
  - Mission 11
  - BMLUK Green Tech Summit
- **Investment initiatives**
  - Sustainable public procurement
  - Environmental funding

RTI Initiative on circular economy

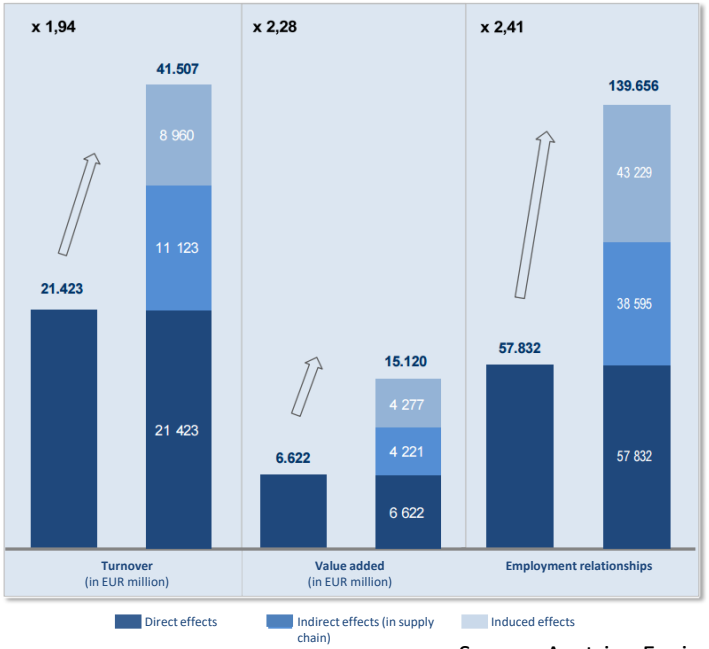
Funding in the area of energy transition and circular economy through BMLUK resources

- Goal 1: Intensification of product use
  (Reuse, Repair, Refurbish, Remanufacture, Repurpose)
- Goal 2: Goal 2: Optimised resource deployment
  (Refuse, Rethink, Reduce)
- Goal 3: Closing material cycles
  (Recycling, Recover)



The Value Creation Cycle
(© Projektfabrik Waldhör)

Economic Effects of Environmental Technology Companies



2023

Note: Calculations according to goods allocation of the respective main environmental technology product.
Source: IWI (2024) based on Input-Output Tables 2020 from Statistics Austria

€ 21 billion annual turnover

58,000 employees

in 3,300 companies

€6.62 billion directly generated value added

(€ 15.12 billion economy-wide)

Source: Austrian Environmental Technology Economy 2024, IWI

Environmental Technology Jobs: WIN-WIN for Environment and Economy

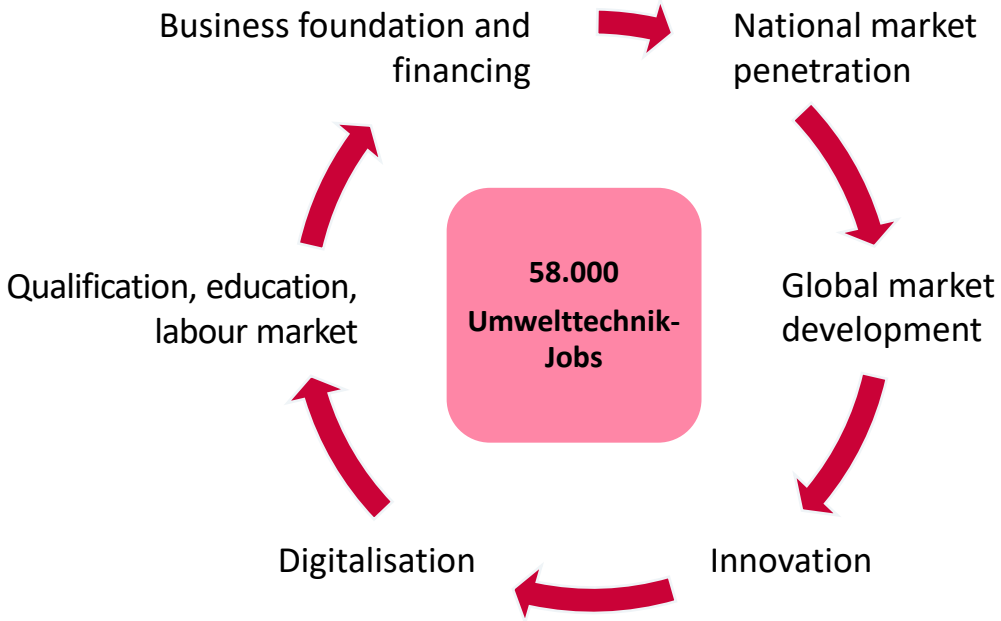
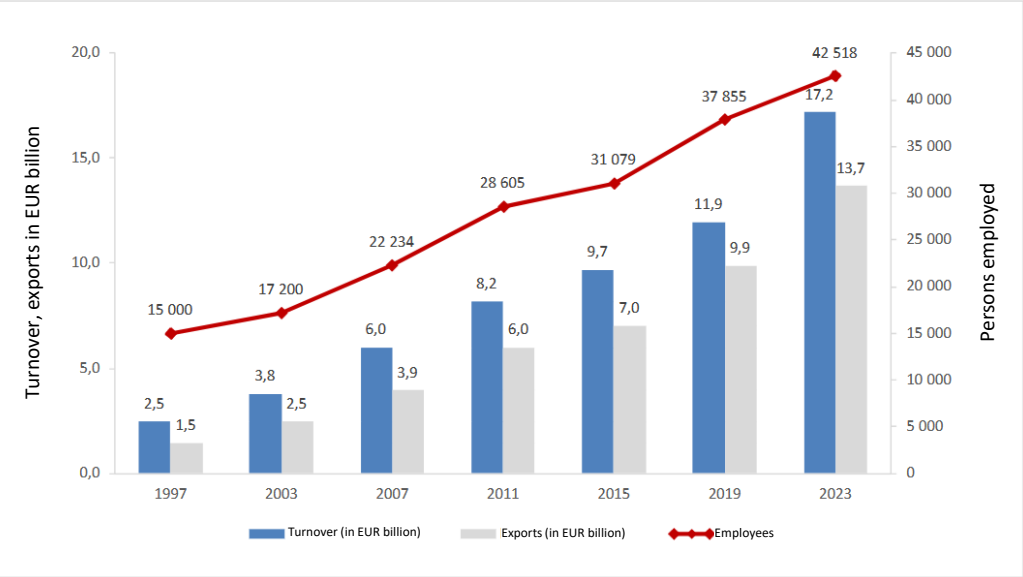


Photo: iStock / Eakarat Buanoi

Measurable Impact of Austrian Environmental Policy

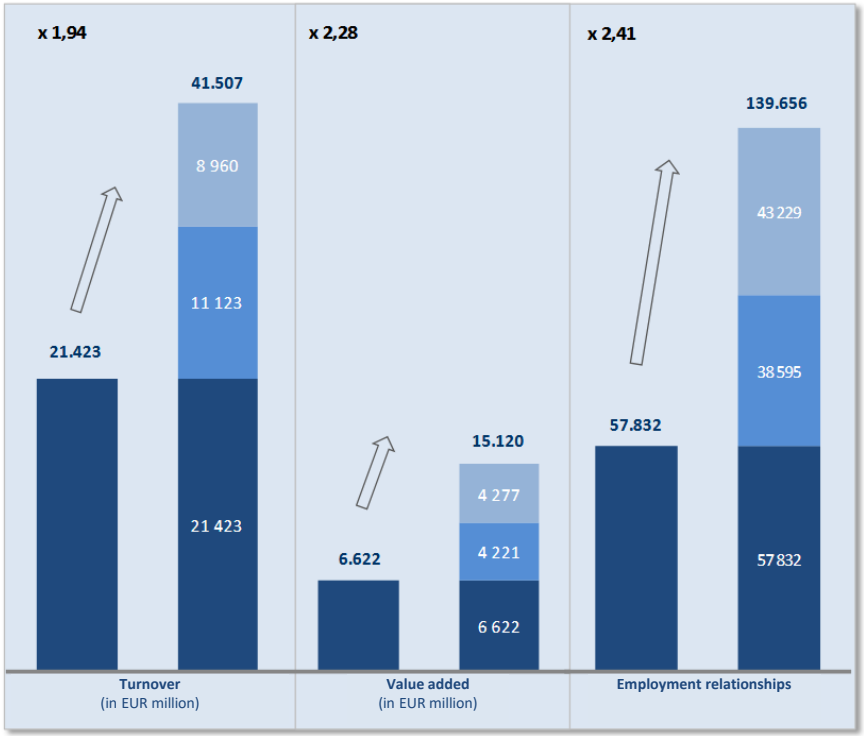


Source: IWI surveys on Austrian environmental technology 2016/2017, 2020 and 2024, IWI projections, WIFO (2000, 2005, 2009, 2013)

Dynamic structural comparison of the environmental technology industry using selected absolute metrics

- €17.17 billion turnover 2023
- +44.5 % increase in turnover since 2019
- Ø Average annual growth of 9.5 % since 2019 (comparison: 4.8 % for manufacturing in Austria)
- 42,518 employees
- Ø Average annual employee increase of 2.9%

Environmental Technology Has Massive Impact on the Overall Economy



Economy-wide effects of the environmental technology economy in Austria

- Direct effects
- Induced effects
- Indirect effects (in supply chain)

Note: Calculations according to goods allocation of the respective main environmental technology product.
Source: IWI (2024) based on Input-Output Tables 2020 from Statistics Austria.

State Prize Architecture and Sustainability 2024

Old Town Hohenems, Photo: Karin Nussbaumer

Renovation and extension **Vienna Museum,** Vienna (Architecture: Čertov, WinklerRuck Architekten for Vienna City Museums)

Renovation and extension of **residential complex Wir InHAUSer**, Salzburg (cs-architektur with Arch. Stijn Nagels for Heimat Österreich gem W.&S. GmbH)

Revitalisation of **Old Town Hohenems**, Hohenems (lohrer.hochrein landschaftsarchitekten und stadtplaner gmbh (meeting zone) for Schadenbauer GmbH (building) and City of Hohenems)

BMLUK Green Tech Summit

Photo: BMLUK, Jack Coleman

- Bi-annual high-level meeting of managing directors from the renewable energy and environmental technology sector with BMLUK
- Ideas and proposals for strong energy and environmental technology in Austria

Climate and Energy Fund

The important research catalyst of BMLUK

Photo: BMLUK, Alexander Haiden

- Founded in 2007 based on the Climate and Energy Fund Act
- Goal of restructuring the Austrian energy system
- € 1.9 billion for innovative research and demonstration projects
- 200,000 projects have been supported

Success Stories Sustainable Development – Agenda 2030

Photo: shutterstock, Natalia Deriabina

- "Environmental Technology" Master Plan and "Environmental Technology" export initiative
- Zero-emission mobility
- Master Plan for sustainable tourism
- "Climate Reporter" initiative
- AGES initiative for soil and climate protection
- Action days for sustainability
- Phase-out of microplastics in products
- Renewable hydrogen
- Securing Austria's water resources
- "Green Finance Agenda" for achieving climate targets
- ... and many more

Environmental Funding – A Success Story for Over 30 Years

Photo: Image by freepik

- The foundation is the Environmental Funding Act 1993
- In 2023: 4,590 funded projects
  - Funding amount € 177.8 million
  - This achieves long-term CO_2 savings of 8.1 million tonnes
  - Energy savings of 402 GWh/year
  - Investments totalling € 762 million
  - 3,900 Green Jobs secured/created

RTI Initiative “Flagship Regions Energy"

Photo: Image by freepik

Green Energy Lab

- Austria's largest innovation laboratory for a sustainable energy future. www.greenenergylab.at

WIVA P&G

- Hydrogen Initiative - Flagship Region Austria Power & Gas. www.wiva.at

New Energy for Industry

- Decarbonisation of energy-intensive industry "Made in Austria". www.nefi.at

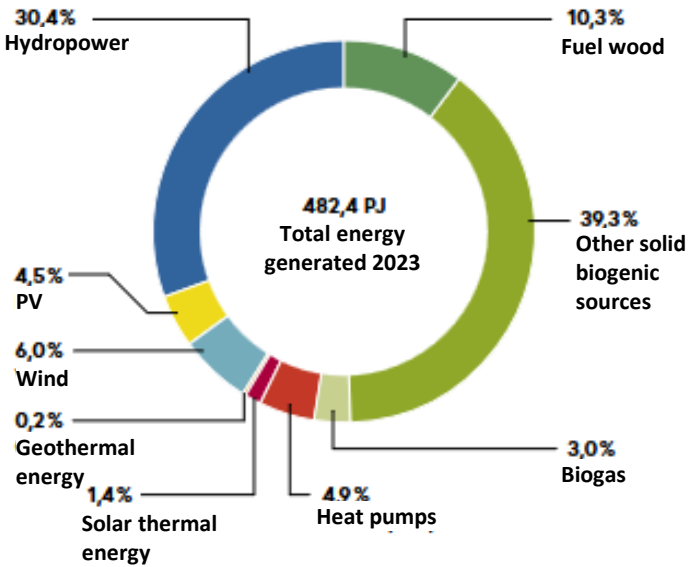
Renewable Energy Technologies

Photo: Image by Freepik

Renewable Energy

Measurable Successes in Employment and Environmental Protection

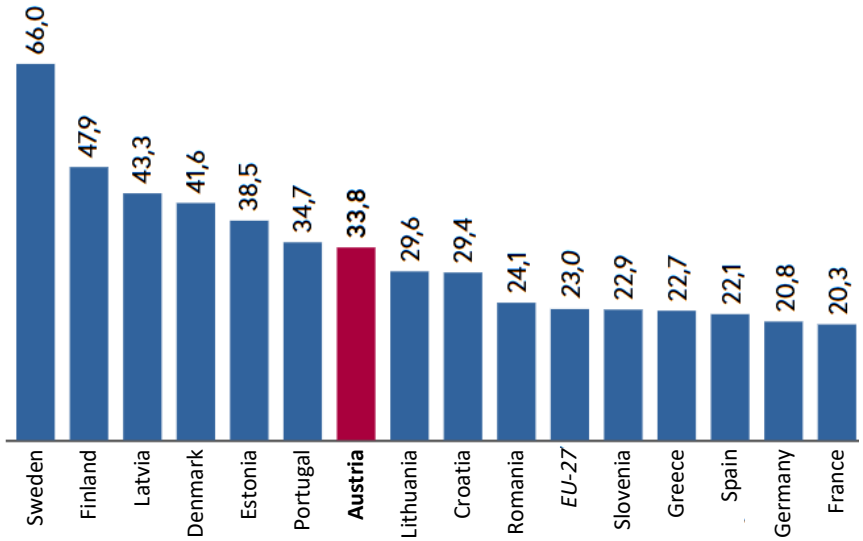
Renewable Energy Generation Structure 2023



Source: Energy in Austria 2024, BMLUK

- 75 % renewable energy share of total electricity consumption
- 87.6 % of total energy generation from renewable sources
- Share of renewable energies in gross final energy consumption 2020 according to RED I: 36.5% (target 34 %)
- +3,600 MW through support contracts for wind power, photovoltaic, hydropower and biomass technologies

High Share of Renewable Energy (Gross Final Energy Consumption)

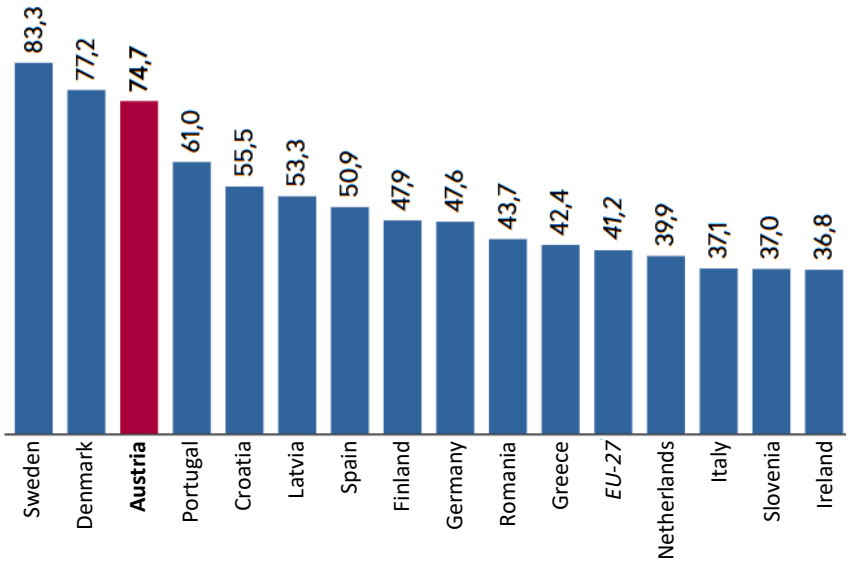


Share of renewable energies in gross final energy consumption 2022 as percentage

- Austria 2022: 33.8 %
- EU-27 average: 23 %

Source: Energy in Austria 2024, BMLUK

High Share of Renewable Energy (Gross Electricity Consumption)



Share of renewable energies in gross electricity consumption 2022 as percentage

- Austria 2022: 74.7 %
- EU-27 average: 41.2 %

Source: Energy in Austria 2024, BMLUK

Storage and Hydrogen as Key Technology

Expansion of renewables and secure supply

Photo: Image by Freepik

Hydrogen Strategy for Austria

Cover Hydrogen Strategy, BMWET

- Hydrogen strategy adopted in 2022
- Strengthening Austria as a business and technology location
- Development of 1 GW electrolysis capacity by 2030
- International partnerships
- Building hydrogen infrastructure
- 8 fields of action
- Numerous funding programmes
- Planned measures already implemented or being implemented

First H_2-using alpine hut

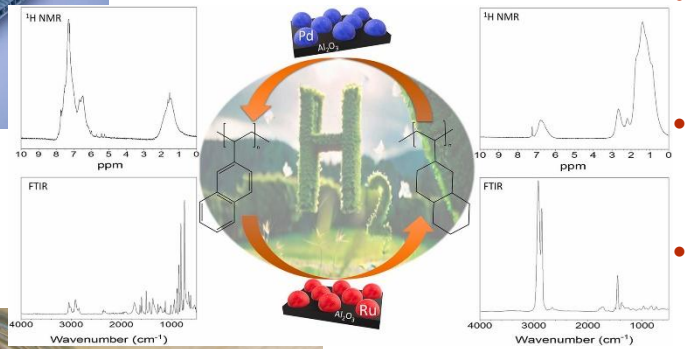
Drone shot of the Sonnschienhütte, Photo: Imre Antal

- Sonnenschienhütte Hochschwab
- First alpine hut with hydrogen energy supply in the DACH region
- Low-pressure hydrogen system saves approximately 15,600 kg CO_2 emissions/year
- Austrian Alpine Club & Hydrosolid

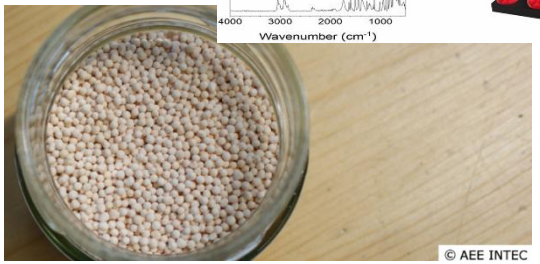
www.alpenverein.at/sonnschienhuette/

Austrian Storage Initiative

Battery pack, Graphic: Samsung SDI Battery Systems



Graphic: MUL, Enhance hydrogen storage in lightweight solid-state systems based on Poly(vinylnaphthalene)



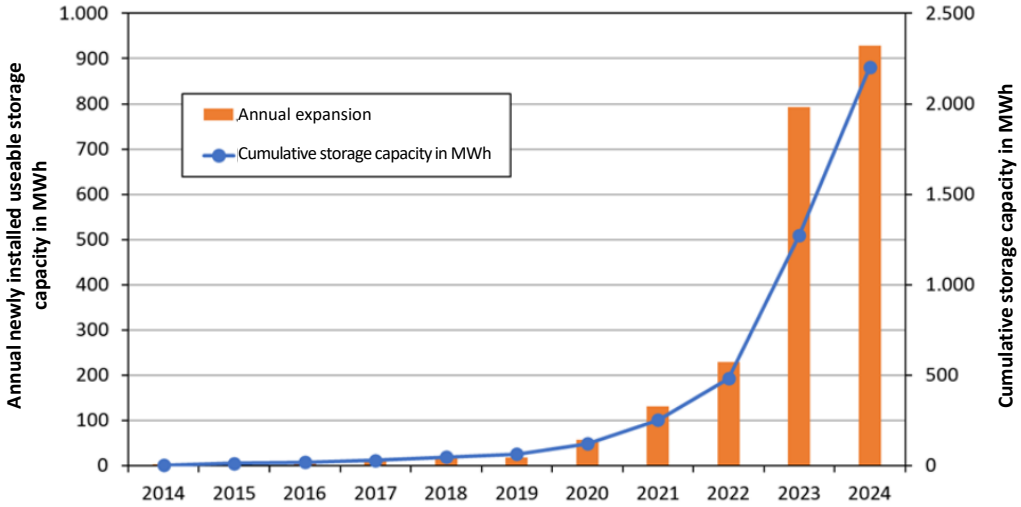
- Storage systems are the key to a completely renewable energy supply
- Research in Austrian strengths in innovative storage technologies
- Development of storage systems for new areas of application
- High temperature, seasonal storage, modular pumped storage, hydrogen/methane, etc.
- Austria has extensive technological competence in storage systems

Large-Scale Storage Project in Solar Park

Photo: Burgenland Energie

- SonnenPark Schattendorf, Burgenland
- Hybrid system combining photovoltaic and wind energy
- Sustainable Organic-SolidFlow technology stores excess energy from the solar and wind park

Battery Storage Systems in Combination with Photovoltaics



Source: University of Applied Sciences Technikum Wien (2025) in Innovative Energy Technologies in Austria, Market Development of PV Battery Storage in Austria until 2024

Useable PV battery storage capacity in Austria in MWh from 2014 to 2024

- Since 2014, a total of 165,045 PV storage systems with cumulative useable storage capacity of 2,200 MWh

Hydrogen as Hub in Sector Coupling

Fronius SOLH$_2$UB, Photo: Fronius International GmbH

- PV electricity is stored as green hydrogen by means of electrolysis
- Use as fuel for hydrogen vehicles
- Seasonal storage and conversion to electricity and heat via fuel cell
- SOLHUB awarded State Prize ^{2018} Environmental and Energy Technology

Hydrogen Projects as Key Technology at VERBUND

Photo: © VERBUND AG

- H2FUTURE: Green hydrogen in the steel industry (VERBUND & voestalpine)
- Underground Sun Storage 2030
- HOTFLEX: Pilot plant for high-temperature electrolysis and fuel cell operation
- Pannonia Green Hydrogen: Green hydrogen from Burgenland
- Green Ammonia Linz: Industrial-scale project

Hydrogen for Decarbonisation of the Steel Industry – voestalpine

SuSteel pilot plant in Donawitz Photo © voestalpine AG

- voestalpine is currently implementing Austria's largest climate protection programme with greentec steel
- Long-term goal is steel production with net-zero CO_2 emissions
- The Group is researching various breakthrough technologies for this purpose
- Hydrogen plays an important role in this

Austria's First Industrial-Scale Electrolysis Plant

Photo ©: OMV Aktiengesellschaft

- Production capacity 10 MW
- Up to 1,500 tonnes of green hydrogen per year at the Schwechat site near Vienna
- Savings of up to 15,000 tonnes CO_2 per year
- One of the first plants in Europe with ISCC certification for the production of renewable fuels of non-biological origin according to the Renewable Energy Directive
- State-of-the-art proton exchange membrane (PEM) electrolysis technology

Electrolyser Gigafactory for Green Hydrogen

Electrolysis stack at ANDRITZ Erfurt © Image: ANDRITZ

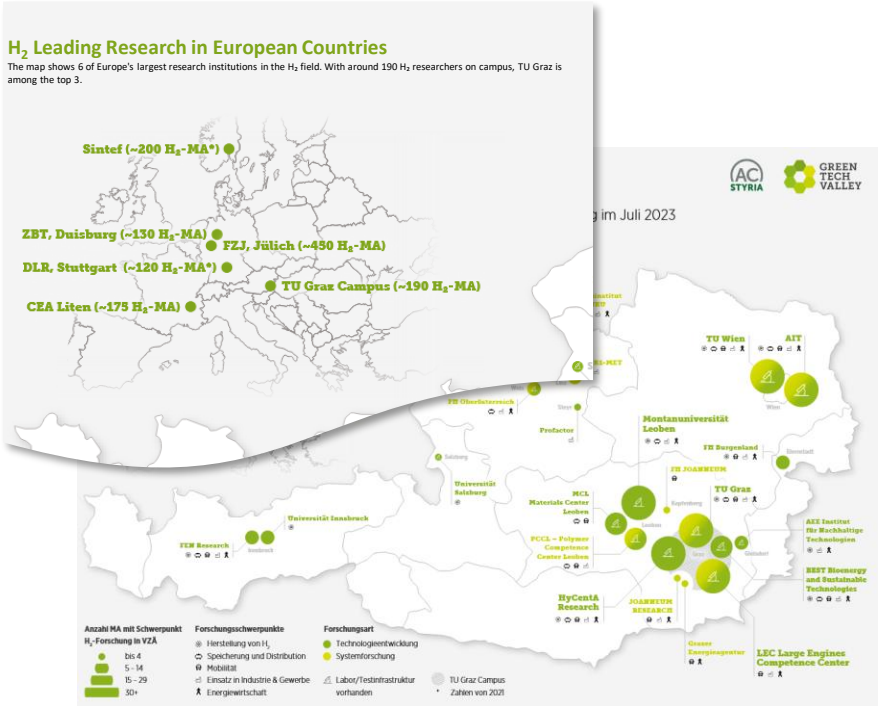
- Austrian company with European value chain, electrolysers engineered in Austria
- Plant opened June 2025
- Initial production capacity – 1 gigawatt
- Corresponds to approximately 160-200 electrolysers per year
- 100 employees in the electrolyser gigafactory

Hydrogen Industrial Inland Valley

Photo: Freepik

- Austria as 1 of 17 active Hydrogen Valleys in Europe
- EU funding programme Clean Hydrogen Partnership
- EU start-up funding € 20 million and planned total investment volume of approximately € 580 million until 2030
- Projects for generation, storage and utilisation of green hydrogen
- Goal: Build a high-performance hydrogen economy by 2030 and advance decarbonisation

H_2 Research Map Austria



Graphic: Green Tech Valley Cluster

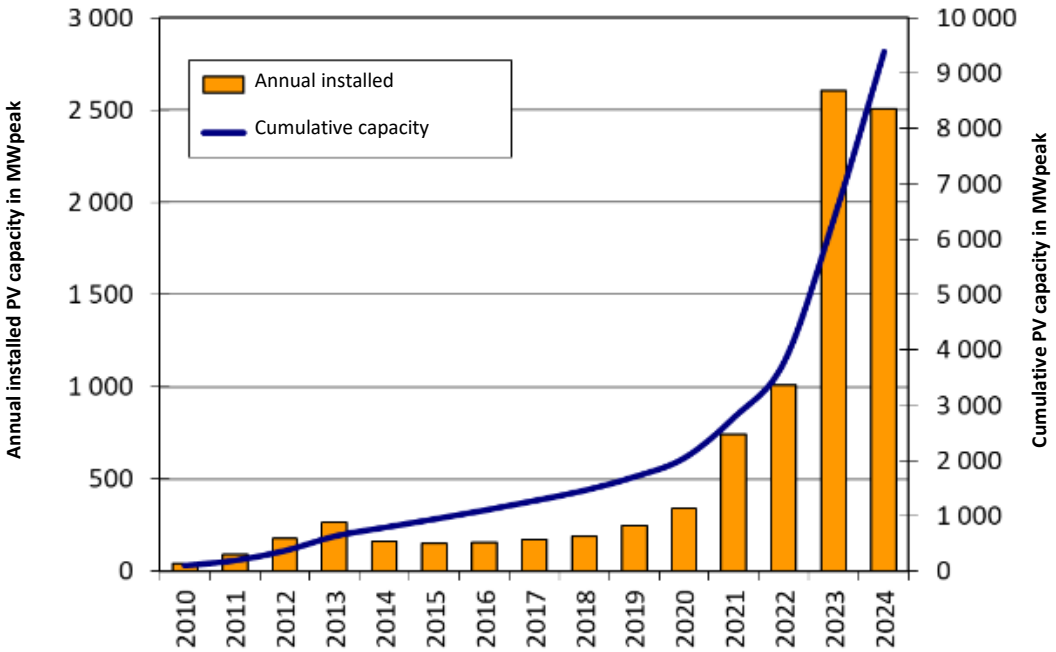
- 22 (non-)university research institutions
- Top 3 in Europe
- Strong increase in researchers in hydrogen technologies since 2021
- Focus is shifting towards industrial applications
- Map with detailed information and contacts accessible online

Photovoltaics

Niche world champion in the field of building integration and part of the energy transition

Photo: Image by Freepik

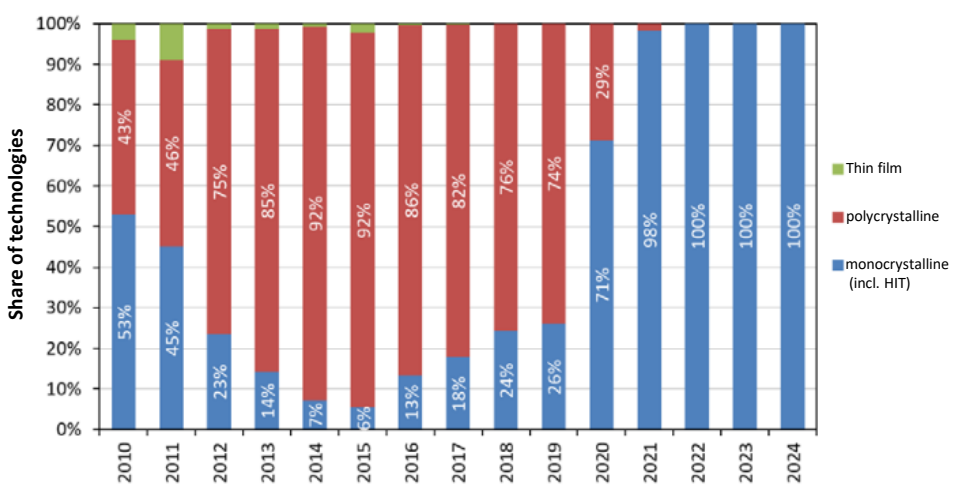
Dynamic Growth and Ambitious Support

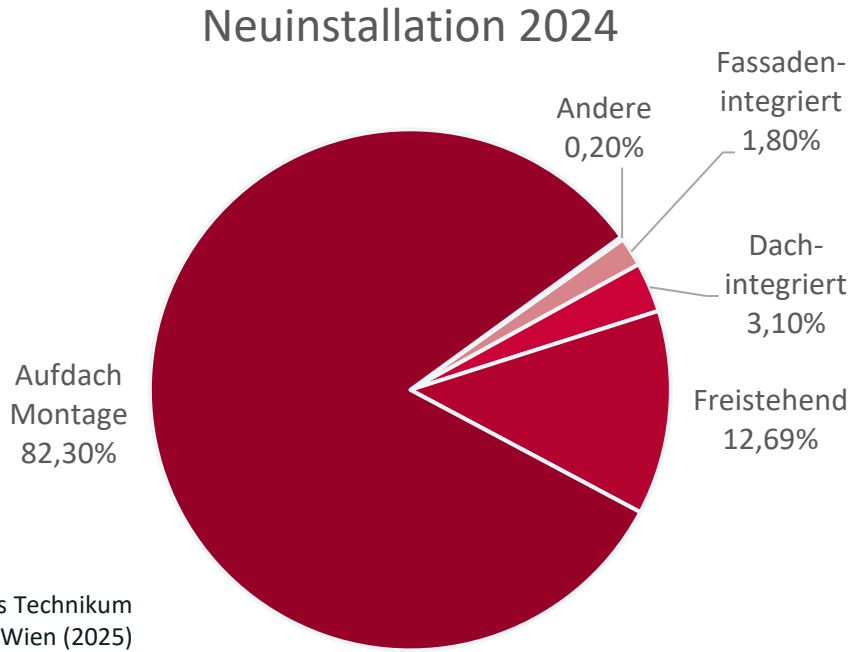


Market Development of Photovoltaics in Austria, Source: University of Applied Sciences Technikum Wien (2025)

- Approximately 480,000 PV systems in operation by end of 2024
- Module capacity output: 9,398 MW_{peak} (+36.43 % compared to previous year)
- Grid connection capacity: 8,458 MW_{peak} (approximately 90% of installed module capacity)
- New installations: 2,509 MW_{peak} (-3.6 % compared to previous year)
- Reduction of 2.1 million tonnes CO_2 equivalent
- Numerous funding schemes for PV investments and research
  - Approximately 2,000 MW_{peak} newly installed capacity through funding programmes

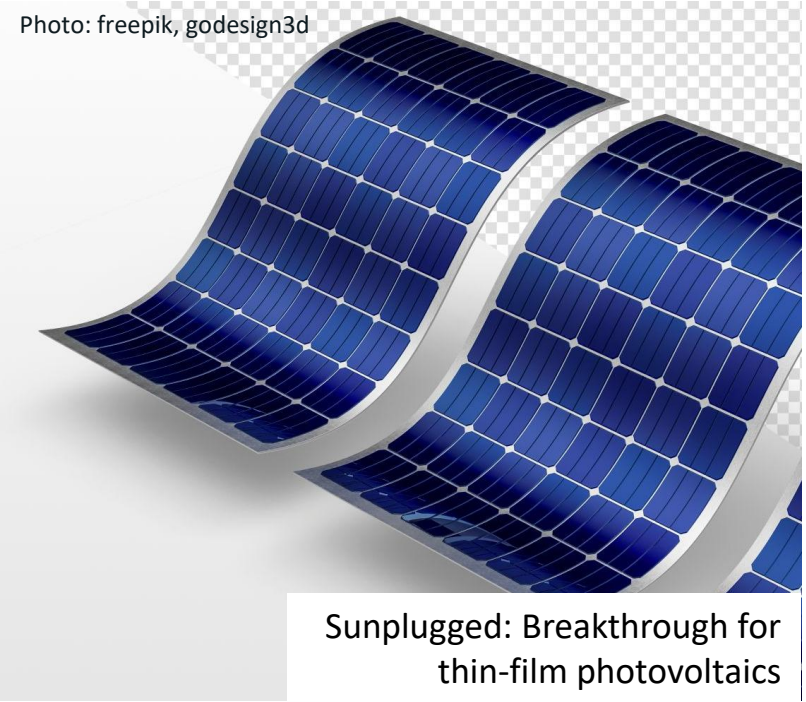
Photovoltaics: Technology and Installation





Source: University of Applied Sciences Technikum Wien (2025)

Examples of PV innovations through funding programmes



Sunplugged: Breakthrough for thin-film photovoltaics

Kite Rise: Next-level for photovoltaic home storage

Fusion of Aesthetic Architecture with Sustainable Energy by Austrian Companies

LernWerkstatt Donau © Photo: VERBUND

CUBOX © HBT Energietechnik, Photo: Wolfgang Spekner

Science Tower SmartCity Graz © Photo: Uwalkin

Primary School Altenstadt, Feldkirch
Photo: Angela Lamprecht Photography

Windkraft Simonsfeld AG / Photo: Patrick Johannsen

Solar Thermal and Solar Cooling

Heat for Austria – Cooling for the hottest regions of the world

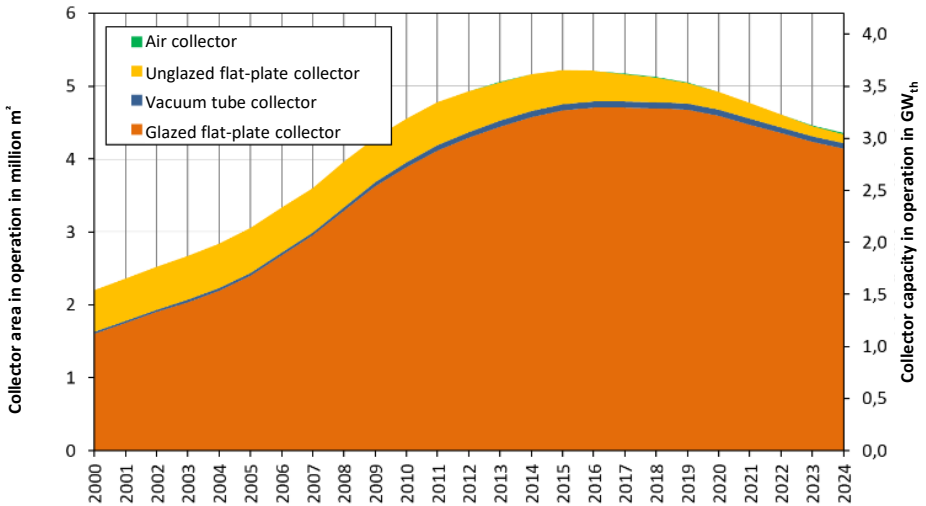
Photo: Image by Freepik

Pioneering Achievements from the Early Days in Solar Thermal

Photo ©: SOLID, picfly.at – Thomas Eberhard

- 1977 Ambitious research programmes by ministries
- 1978 Most modern and largest collector manufacturing facility in Europe founded
- Funding from 1992 leading to a broad solar campaign from 1999
- Austria pioneer in funding – market growth in other countries could benefit from an already developed industry
- Long-standing integral component of new residential buildings in Austria
- New focus on district and remote heating systems as well as solar heat for industrial processes

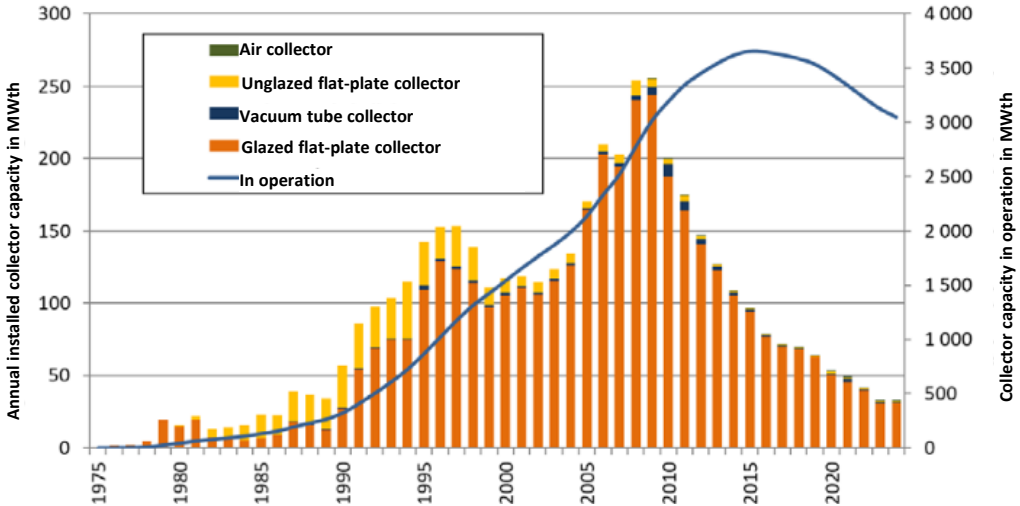
Austrian Solar Thermal in Operation



Source: Thermal collectors in operation in Austria
Collector area and installed capacity in the years 2000 to 2024.
Sources: until 2006: Faninger (2007), from 2007: AEE INTEC (2025)

- 4.4 million m² collector area in operation (end 2024)
- Total capacity 3.1 GW_{th}
- Approximately 700 full-time positions
- EU comparison:
  - 5th place for installed collector area per inhabitant
  - 13th place for installed glazed collector area
- Annual CO_2 emissions saved: approximately 277,186 tonnes CO_2 eq
- 1,950 GWh_{th} district heating produced

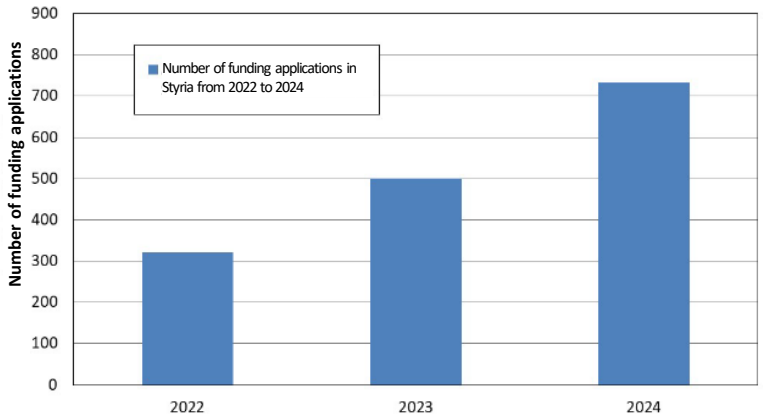
Austrian Market Development in Solar Thermal Energy



Source: AEE INTEC (2025) in Innovative Energy Technologies in Austria, Market Development 2024

- Newly installed area 2024: 47,623 m²
- Newly installed capacity 2024: 33.3 MW_{th}
- Solar hybrid collectors (PVT)
  +624 % new installations compared to previous year
- Domestic market growth: +0.2 %
  – first growth since 2009
- Exported collector area: 232,145 m²
  (export share declining: 88 %)
- Approximately 700 full-time positions

Funding and Campaigns Have Lasting Effects



Source: Styria State figures; Graphic AEE INTEC

- **Industry campaign** 2023/2024 in Styria with two central measures:
  - Doubling of state funding
  - Efficient information campaign
- Increase in number of funding applications by 228 %
- Increase in **solar bonus** for small systems within the framework of "Phase-out Oil & Gas" was clearly noticeable

Global Peak Values for Installed Collector Area and Industrial Process Heat

Photo ©: SOLID, Barbara Krobath

- 4th place for Austria in solar-assisted district and remote heating systems, worldwide behind Denmark, China and Germany
- 6th place in industrial process heat behind Mexico, Germany, Netherlands, India and China

International Projects in Solar Heating & Cooling

Solar heating and cooling of the UNITED WORLD COLLEGE, Singapore Photo ©: SOLID

World's largest solar thermal system at Arcon-Sunmark in Silkeborg/Denmark © GREENoneTEC

Solar cooling in the Sheikh Zayed Desert Learning Center, UAE Photo © SOLID

Number 1 on the Solar Market Comes from Austria

Photo ©: GREENoneTEC

GREENoneTEC as the world's largest thermal flat-plate collector manufacturer

- has over 30 years' experience
- and an annual production capacity of over 1.6 million m² collectors.

Heat Pump

Highly efficient use of electricity for heat production

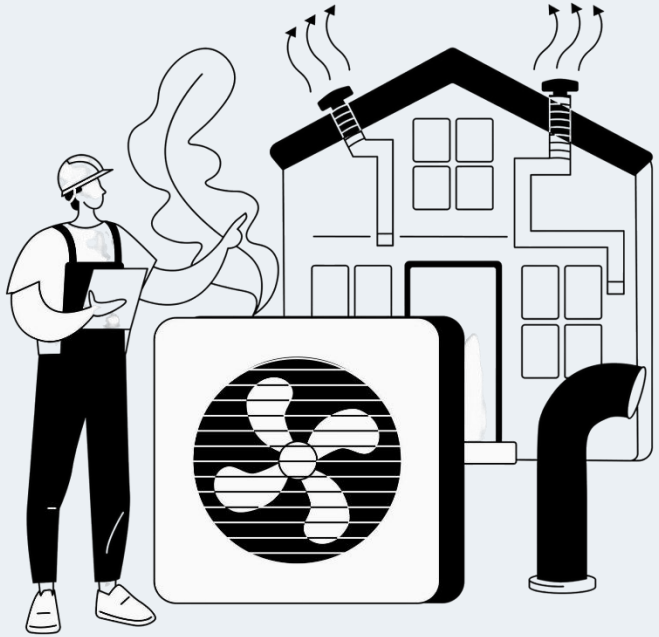


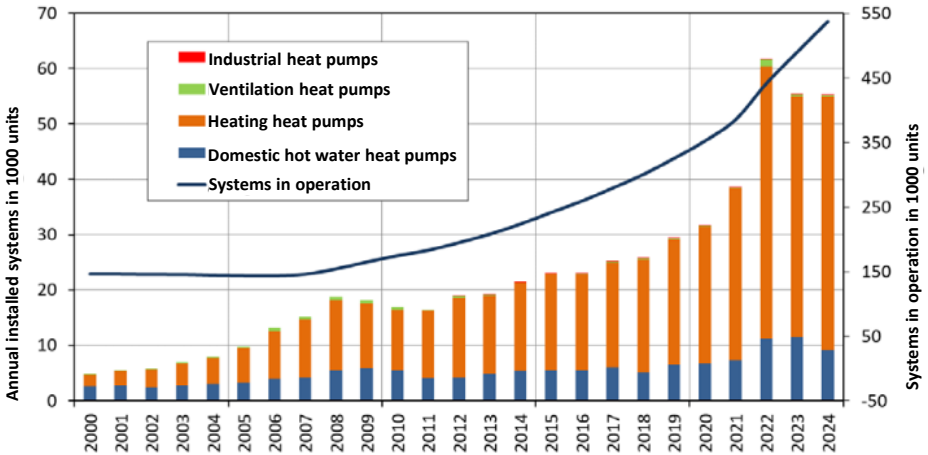
Photo: Image by Freepik

Austria's Electricity Mix Combined with Best Heat Pump Technology for Maximum Emission Savings

Image by Freepik

- Total turnover of the heat pump industry:
  - € 988 million in 2024
  - 2,900 full-time employees in this sector
- Air-to-water heat pumps dominate with a market share of 87%
- In 2024, 1.256 million tonnes CO_2 equivalent net savings were achieved

A Heat Pump Country as Space for Innovation



Source: ENFOS (2025) in Innovative Energy Technologies in Austria, Market Development 2024

Heat pump market development in Austria 2024

- Domestic market overall almost stable: 55,367 new installations (-0.1 % compared to 2023)
- Stock: 537,000 Heat pumps
- Federal and state funding available
  - approximately 40,000 private and commercial heat pumps funded in 2024

Research in Heat Pump Technology

Image by Freepik

- **Current research fields:** optimal refrigerants, low-noise heat source systems, higher performance ranges, use of large heat pumps, e.g., in district heating and energy networks, applications in industrial processes with high temperature requirements
- Austria's technology leaders have a high **R&D ratio** (OCHSNER Heat Pumps founded its own technology centre in 2024, Heliotherm FFG success story with new refrigerant)
- Austria's technology leaders **are growing strongly**
- Certificates and awards for companies and heat pumps

Passive Houses

The highest
passive house density
worldwide

Photo: Designed by Freepik

Reducing Heating Demand to Near Zero in Harsh Climate is a Special Achievement

Goldegg, Photo: pixabay, Ming_SONG

- 10 % of CO_2 emissions from buildings in Austria (35 % worldwide of energy consumption)
- Payback period for heat pump heating approximately 2 years
- Targeted research and technology programme lines
- Reference projects in Europe-wide passive house database
- Over 1,000 documented passive house and EnerPHit buildings in Austria (6,000 worldwide)
- Over 38,000 certified residential units in passive house standard with certified area of over 4 million m²

Every Sixth Passive House Worldwide is in Austria

Innsbruck Photo ©: SimonRei

- Concept was proactively adopted as early as 1994
- 1996 First passive house built
- Over 1,000 passive houses documented in Austria
  - 6,000 passive houses worldwide
- 2023: 300,000 m² passive house certified useable area in Austria (3.5 million m² worldwide)
- City of Innsbruck leads Europe-wide in terms of passive house density

Long-Term Evaluation Provides Important Insights

Photo: Freepik, DC Studio

Long-term evaluation of 100 flagship buildings in Austria shows:

- Highly efficient buildings function in practice
- High efficiency is plannable and economical
- Current minimum requirement level for new buildings is insufficient to achieve climate targets
- Optimal energy sources for new construction are heat pumps or district/remote heating
- Large PV systems are close to economic viability
- Analysis of real energy consumption of buildings is only just beginning

Austria Takes Energy Know-How into the Saudi Arabian Desert

Solar cooling in the Sheikh Zayed Desert Learning Center, UAE Photo © SOLID

- Pioneering flagship project "Sheikh Zayed Desert Learning Center"
- Austrian building technology: BIPV, solar cooling, building control systems, LED technology, planning, passive house technologies
- Certifications
  - LEED (USA)
  - ESTIDAMA (Arab Green Building Seal of Approval)

Austria: Internationally Highest Quality of Life and Smart City Pioneer

Aerial view Seestadt © ASCR, Photo: Walter Schaub-Walzer

- Vienna for years the most liveable city in the world (10 times 1st place, 2023 2nd place according to Mercer study)
- 11 % of all EU Smart City projects are in Austria, in 11 Smart Cities
- ASCR - Aspern Smart City Research - is one of Europe's largest and most innovative research projects

Biomass (pellets)

Forest wealth in Austria and state-of-the-art biomass technology for the world market

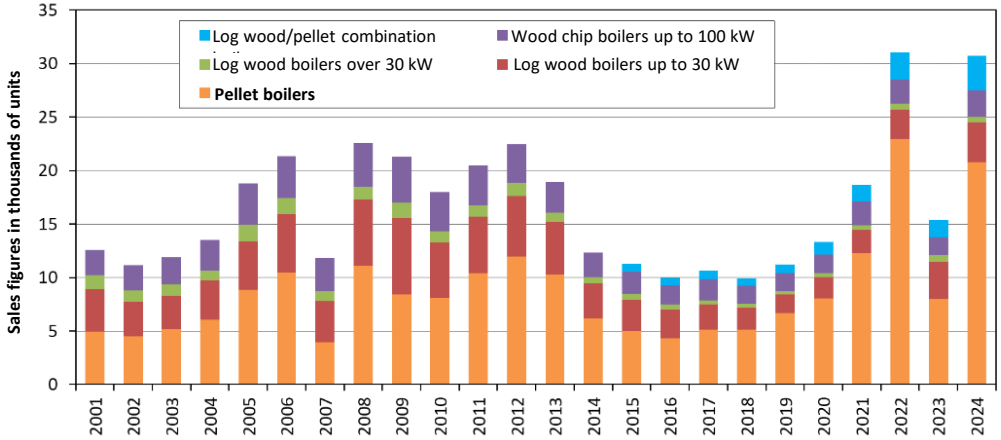
Photo: Designed by Freepik

Austria: Land of Forests & Innovative Biomass Technologies

Photo: Uwe Kienle

- Almost 50 % of the federal territory is covered by forest
- 30 million cubic metres grow annually
- Austrian Forest Strategy with 49 targets
- 101 locations for biomass technologies (from engineering to manufacturing)

Development of Biomass Boilers and Stoves in Austria



Biomass boilers sold annually in Austria
up to 100 kWth; Source: LK LOWER AUSTRIA (2025)

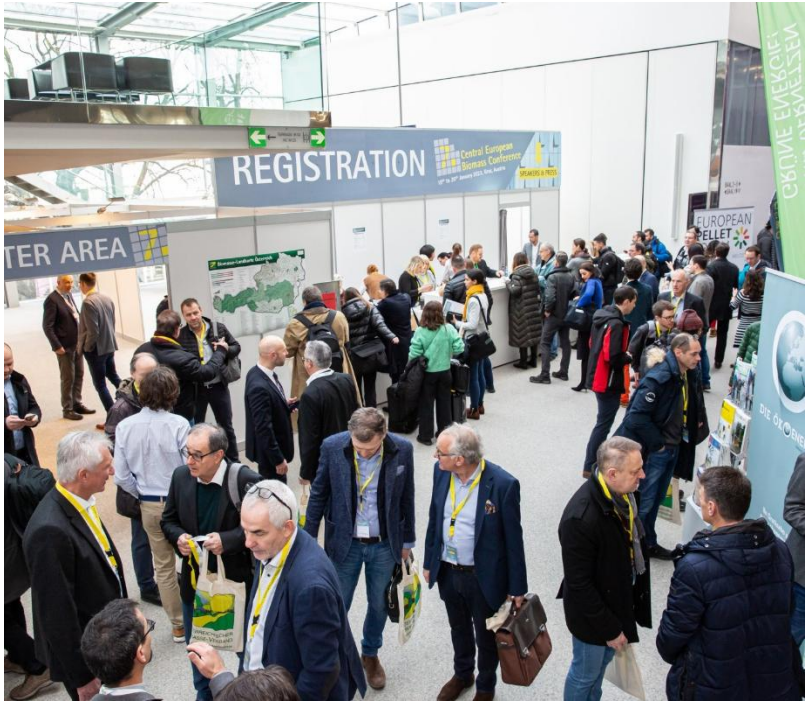
- Market development 2024 boilers:
  +96 % compared to previous year
- Market development 2024 stoves:
  -69 % compared to previous year
- Green power plants 2024:
  +250 % capacity compared to previous year
- Turnover € 1,750 million entire industry
- Employment effect: 6,875 jobs
- Export share 60-90 %

Austria Has Leading Role in World Market for Pellet Production and Pellet Boilers

© proPellets Austria

- Pellet boilers approximately 90 % export share
- 2/3 of pellet boilers installed in Germany are from Austria
- Leading manufacturers of pellet production plants come from Austria

Central Europe's Biomass Community Meets in Austria



www.cebc.at, Photo: @Viennamotion

- Central European Biomass Conference in Austria
  - 3-year cycle, next takes place in 2026
  - 1,600 participants from 37 countries and 4 continents (one of the largest industry events worldwide)
  - Exchange between science, politics, industry and society
- European Pellets Forum

Biomass Technology For Green Electricity

ANDRITZ processing and storage systems for biomass at Eldorado © Photo: ANDRITZ AG

- First Brazilian thermal power plant for tree residues (eucalyptus waste) from pulp production
- Heating plant technologies from Austria (ANDRITZ AG)
- Green electricity for 700,000 households

Current Topics in Bioenergy Research

Photo © proPellets Austria

- **Diversification of raw materials**
  Extension of raw material spectrum to diverse energy crops, biogenic residues and waste streams
- **Technological advancement**
  Optimisation of conversion technologies (e.g. gas generation, pyrolysis, HTL) and catalysts – focus on cost reduction, emission reduction and raw materials with high ash content
- **Industrial integration & sector coupling**
  Integration of bioenergy and biofuels into existing industries (e.g. pulp, paper, refineries) & provision of bio-based value chains
- **Decarbonised energy systems**
  Progress in biomass combustion (incl. CHP, emission reduction) and development of industrial net-zero or negative-emission biorefineries.
- National and transnational **research funding** (ERA-NET Bioenergy)

The Wood Energy Prize

Cover of the brochure The Wood Energy Prize 2024, Austrian Biomass Association

- Awards in three categories:
  - **Individual heating** (Hargassner – first sustainable heating for Ski Flying World Championships at Kulm)
  - **Industry** (Donausäge Rumplmayr – Austria's most modern pellet plant)
  - **District and remote heating** (Office for Renewable Energy Ing. Leo Riebenbauer – Austria's largest wood gas CHP plant)

Hydropower

Pillar of energy generation in Austria with technology leaders on the world market

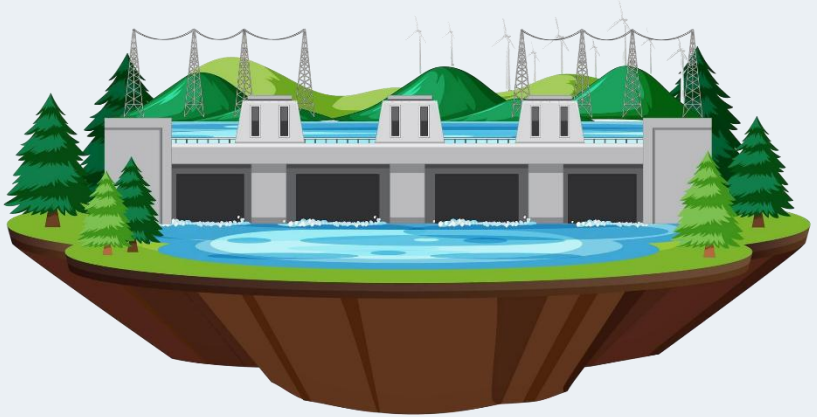


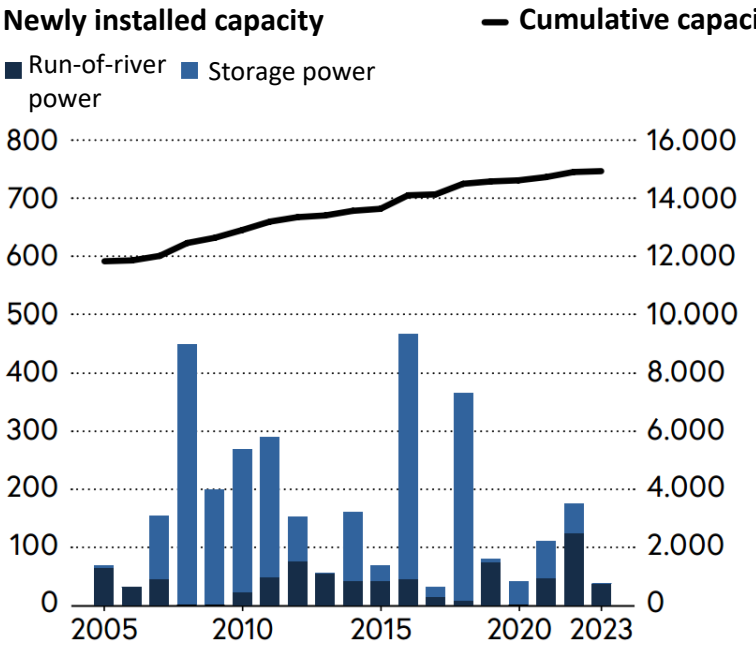
Photo: brgfx, Freepik

Hydropower – Public Awareness and Laws Create Success

Wankam Weir, Photo © KWG

- Broad public acceptance through environmentally compatible power plants
- Environmentally compatible use of hydropower through Water Framework Directive
- Firmly anchored in the regional economy

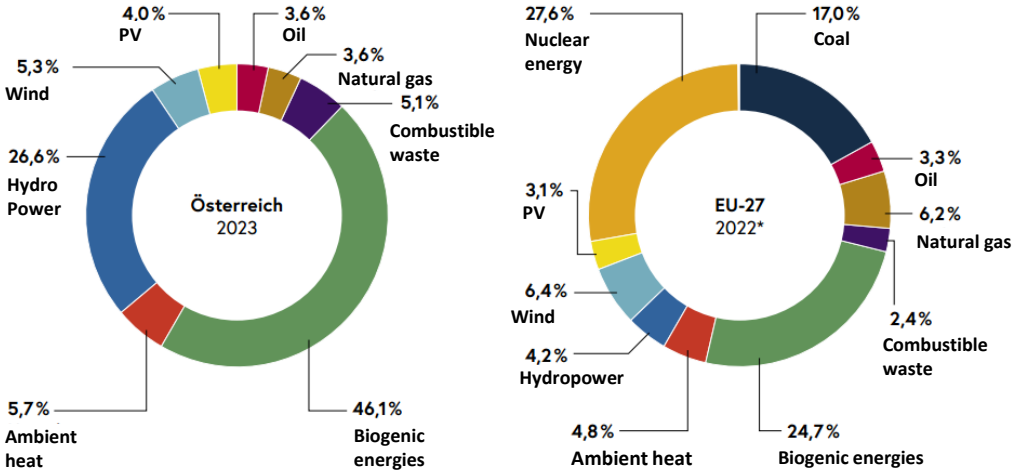
Hydropower as Pillar of Sustainable Energy Generation



Energy in Austria, Numbers, Data, Facts; BMLUK, 2024; Data: E-Control (2023, provisional)

- 54-67 % of domestic electricity generation
- 3,224 hydropower plants (95 % of which are small hydropower)
- Total installed capacity just under 15 GW
- 2025-2023 hydropower capacity +1.3 % p.a.
- Currently expanding small hydropower, revitalising older plants, storage power plants
- Possible expansion potential of hydropower by 2030: around 5 TWh

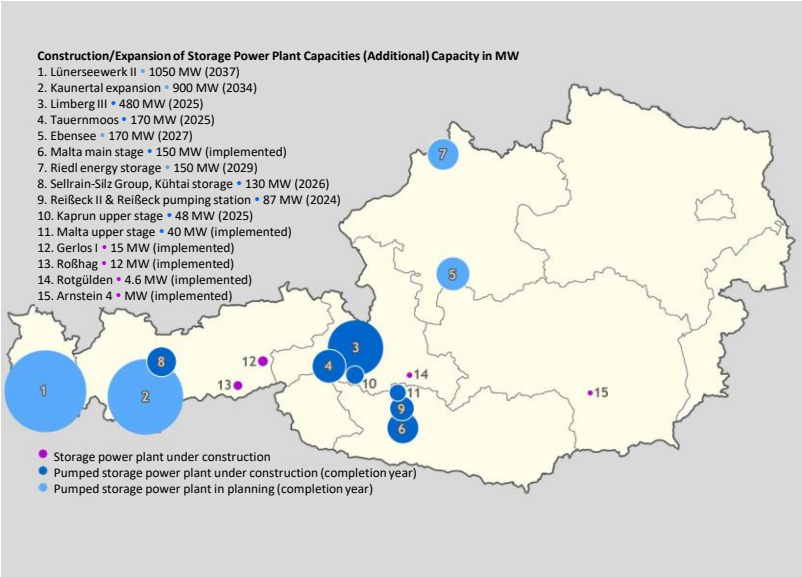
Austria Among the Leaders in Electricity Generation from Hydropower



Energy in Austria, Numbers, Data, Facts; BMLUK, 2024; Data: Eurostat

- Total capacity of 15 GW
- 3,107 run-of-river and 117 storage power plants
- Revitalisation and expansion in last 20 years
- High expertise in planning, construction and operational areas

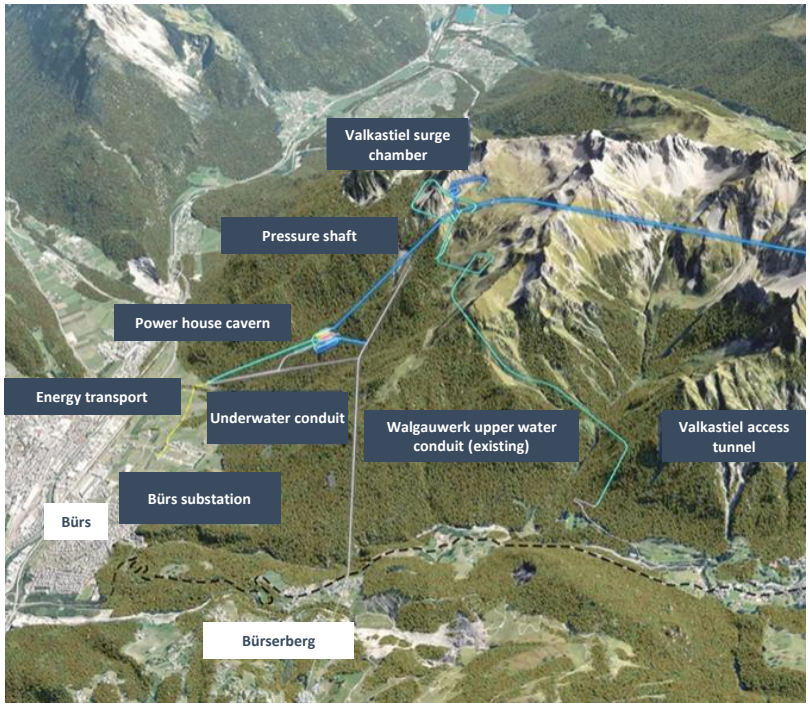
Austria Guarantees Security of Supply



Planned/under construction (pumped) storage power plants in Austria © Energy Institute of the Economy Ltd, 02/2025

- Pumped storage power plants for efficient electricity storage
- Efficiency rates of 75% and more
- Balancing seasonal and time-of-day fluctuations of other renewable energy sources
- 4.2-4.3 GW large-scale electricity intermediate storage (primarily pumped storage power plants) in Austria

Lünerseewerk II – Austria's Most Powerful Pumped Storage



© illwerke vkw AG

- 1,100 megawatts in both turbine and pump operation
- Continuously adjustable within seconds from 100 % turbine operation to 100 % pumping operation
- Construction planned 2031-2037
- In 1958, Lünerseewerk was the world's largest high-pressure pumped storage plant

Hydropower Plant Components from Austria on the World Market

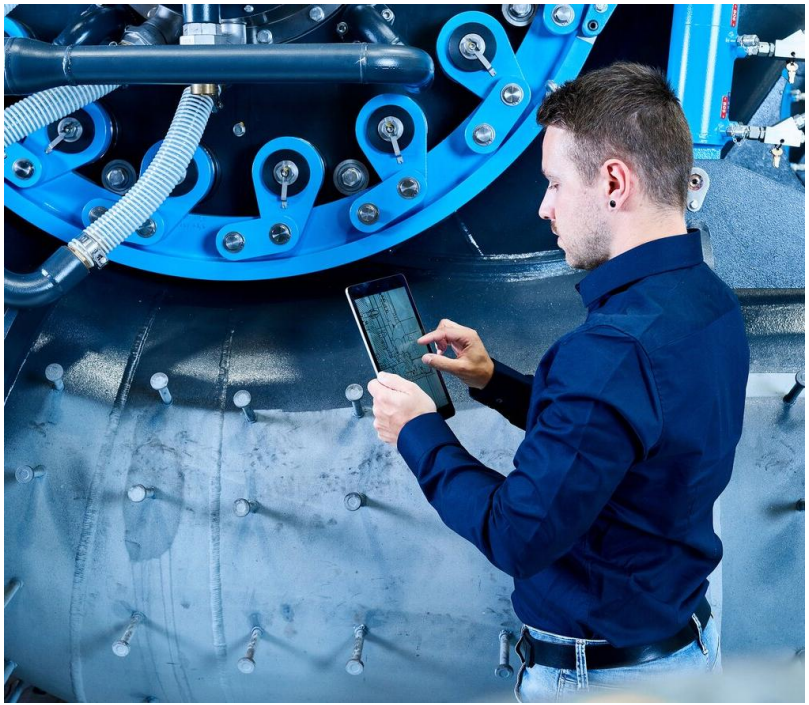


Photo © Global Hydro

- Turbines from Austria in power plants worldwide
  - Major projects worldwide (Nepal, Malaysia, India, Australia, Brazil, USA, Turkey, India, China, Tajikistan, Vietnam, etc.)
- Turnkey solutions for hydropower plants with Kaplan, Francis or Pelton turbines
- Greatest current relevance: Revitalisation of existing plants worldwide

Nature Conservation, Renaturalisation and Fish Migration Assistance

Langwies Kösslbach © BMLUK

- Shortens the time until natural, location-typical flora and fauna re-establish themselves
- Integration into the landscape
- Afforestation and planting
- Creating biotope areas with deadwood, root stocks and floodplains
- Fish migration assistance at hydropower plants and weir facilities

Wind Energy

Wind power in Austria is gaining momentum

Image by storyset on Freepik

Development of the Wind Energy Industry in Austria

Wind turbine in operation Photo © Federal Chancellery / Andy Wenzel

- Wind power is catching up in Austria and already covers 16 % of electricity demand (9.37 TWh)
- 1,451 wind energy plants in operation
- Nominal capacity of all systems 2024: 4,028 MW
- 116 new wind turbines 2023/2024
- Wind industry turnover: € 1.7 billion
- Average export share: 91%
- Jobs: ~7,600 people in operations, construction, maintenance, decommissioning and supplying industries
- Expansion volume by 2030 according to Renewable Energy Expansion Act must increase more strongly (addition of 10 TWh wind power)

Waste Management and Circular Economy

From waste to valuable material with service and product innovations from Austria

Graphic: katemangostar, Freepik

Austrian Circular Economy Strategy

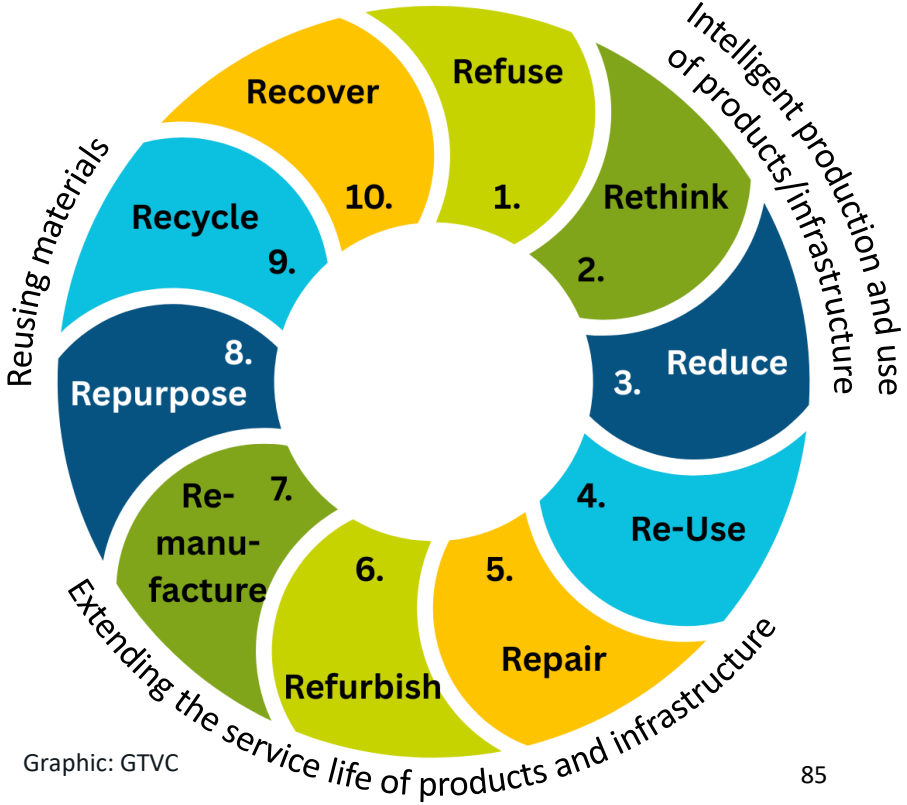
Graphic: COPE Content Performance Group

- **Core targets (2030):**
  - ≤ 14 tonnes DMC per capita/year
  - Resource efficiency +50 %
  - Circularity rate 18 %
  - Private household consumption -10 %
- Seven **transformation fields**: e.g., construction, mobility, plastics, biomass, textiles, waste/secondary resources
- **Implementation tools**: Regulation, market incentives, funding, RTI, digitalisation, education & cooperation

The Successful Strategy of Avoidance and Utilisation

In the Austrian circular economy strategy, 10 principles in 3 fundamentals are of central importance for a functioning circular economic system.

The **10 R Circular Economy Principles**



Graphic: GTVC

Reusing materials

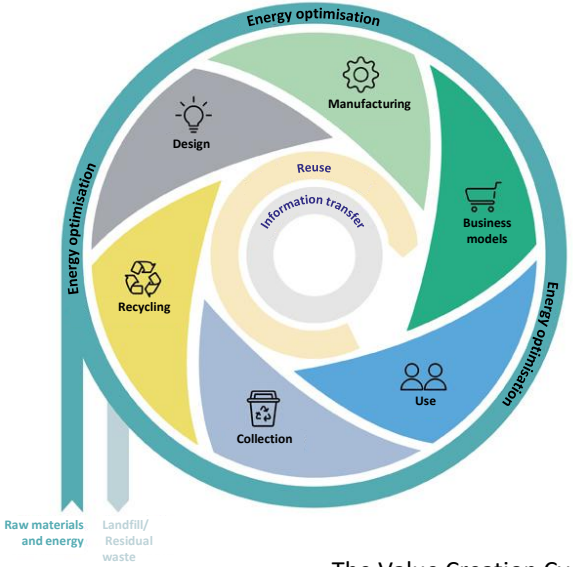
Intelligent production and use of products/infrastructure

Extending the service life of products and infrastructure

Austria's RTI Initiative Circular Economy

Funding in the area of energy transition and circular economy through BMLUK resources

- Goal 1: Intensification of product use
  (Reuse, Repair, Refurbish, Remanufacture, Repurpose)
- Goal 2: Goal 2: Optimised resource deployment
  (Refuse, Rethink, Reduce)
- Goal 3: Closing material cycles
  (Recycling, Recover)



The Value Creation Cycle
(© Projektfabrik Waldhör)

Success Example: Circular Economy Funding Under the UFG

- € 61 million funding available for 2025
- Eligible: Investment costs, planning expenses, intangible measures (qualification, concepts, studies)
- Minimum project size: € 50,000, maximum funding per project: € 5 million
- Funding rate: 30 - 80 % (depending on company size and application of the de minimis rule)

Investments and intangible measures in the fields of action:

- Circular Design
  - Sustainable product design
  - Sustainable design of production processes
- Sustainable business models
- Sorting of separately generated or separately collected waste, including donations
- Reuse, refurbishment and preparation for reuse
- Recycling and other material recovery of waste

Success Example: Circular Economy Task Force

Photo: freepik

The Circular Economy Task Force was established in July 2023.

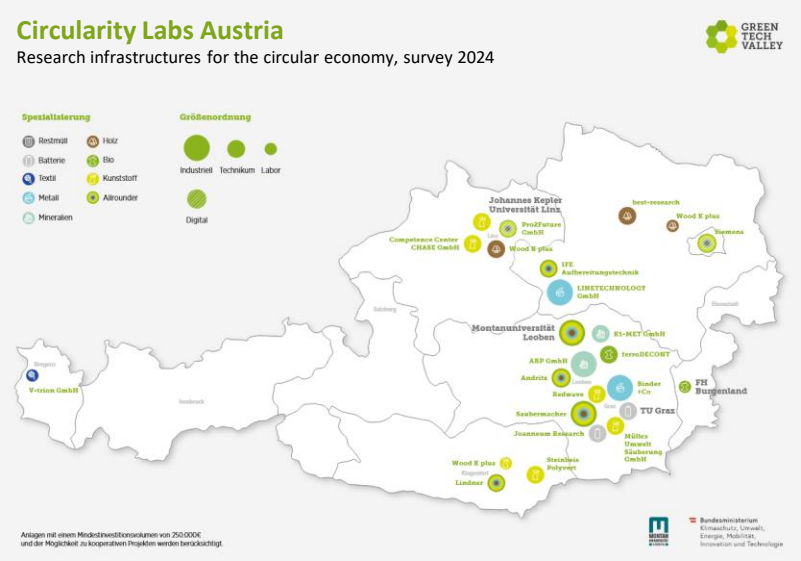
This advisory board provides long-term support for implementing the circular economy strategy
and aims to advance it through action recommendations and priority setting for politics and administration.

Success Example: Circular Lab Initiative

Photo: freepik

- Climate Lab as Austrian centre for the circular economy
- Part of the Austrian government's circular economy strategy
- Promotion of networking, knowledge exchange and cooperation in the area of the circular economy
- Activation of the cross-industry community of innovators
- Provision of a central space for co-working and events for professionals in this field

Circularity Labs Austria



Graphic: Green Tech Valley Cluster

- Survey of the research infrastructure for the circular economy in Austria
- 25 test laboratories result in high concentration in the area of the circular economy
- Map with detailed information available online

Success Example: Austrian Mattress Alliance

Photo: freepik / krakenimages

- For organisations along the mattress value chain
- Founded in 2024 with 16 founding members
- The ÖMA Association is the result of a Climate Lab programme
- Projects:
  - Circular design criteria for mattresses
  - Extended producer responsibility
  - Digital product passport

Global Leadership Position in EPI Ranking "Waste Management"

Country	Rank	Score	10Y delta
Belgium	11	65.1	-4.9
Estonia	11	65.1	2.5
South Korea	13	64.7	-2.8
Austria	14	63.8	-3.4
Luxembourg	14	63.8	0.5
Lithuania	16	61.3	4.5
Ireland	17	60.7	4.3
France	18	59.6	3.0

Source: EPI Environmental Performance Index, Yale Center for Environmental Law & Policy, Waste Management, 2024

- Yale & Columbia University "Environmental Performance Index" 2024
- "Hazards from waste to humans and the environment"
- 3 indicators:
  - Per-capita generation of municipal solid waste
  - Controlled solid waste
  - Recovery of energy and materials from waste
- 14th place out of 180 countries assessed

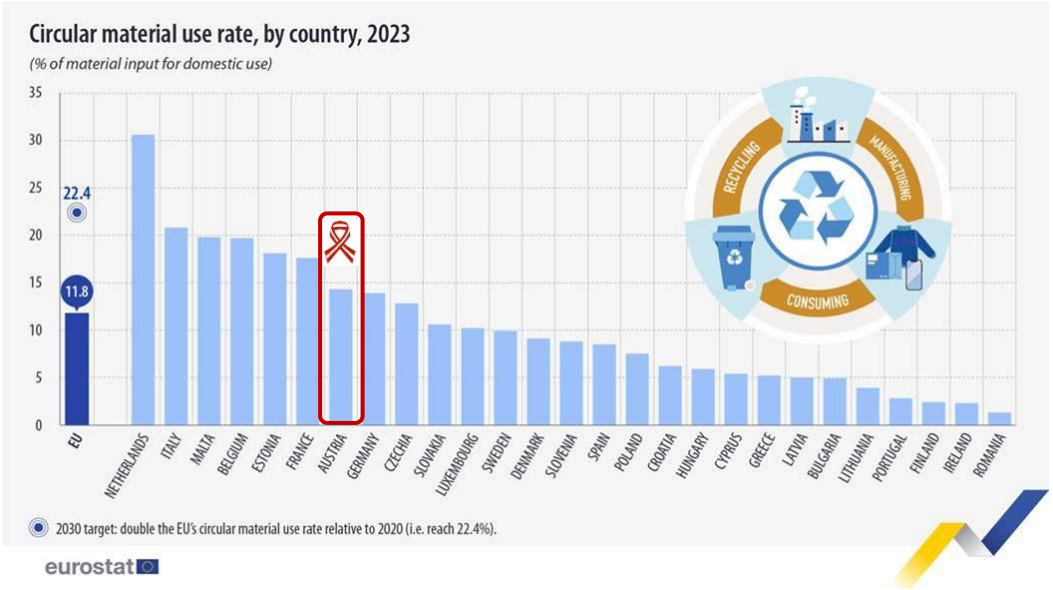
Global Leadership Position in EPI Ranking "Waste Recovery Rate"

Country	Rank	Score	10Y delta
Belgium	5	98.9	4.0
Germany	5	98.9	4.5
Netherlands	7	97.7	0.2
Austria	8	97.6	2.4
Singapore	9	96.7	-0.5
Taiwan	9	96.7	-1.4
Luxembourg	11	95.9	0.5
Japan	12	94.4	1.7

- Yale & Columbia University "Environmental Performance Index" 2024
- "Quality of municipal solid waste management"
- 8th place out of 180 countries assessed

Source: EPI Environmental Performance Index, Waste Recovery Rate, 2024

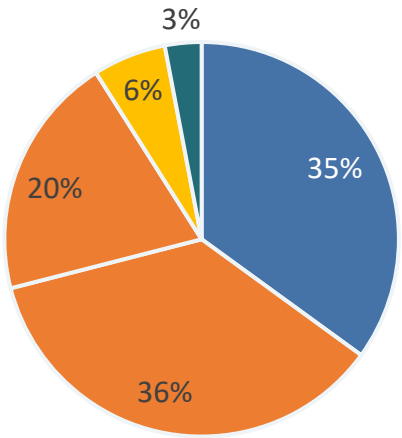
Circular Material Use Rate Rising



- Eurostat indicators Measurement - circular material use rate
- Austria in 7th place with 14.3 % circular material use rate
- Netherlands with 30.6 % highest circular material use rate
- Austrian rate has risen continuously since 2010

Source: eurostat, News article from 29.08.2025

Waste Generation in Austria

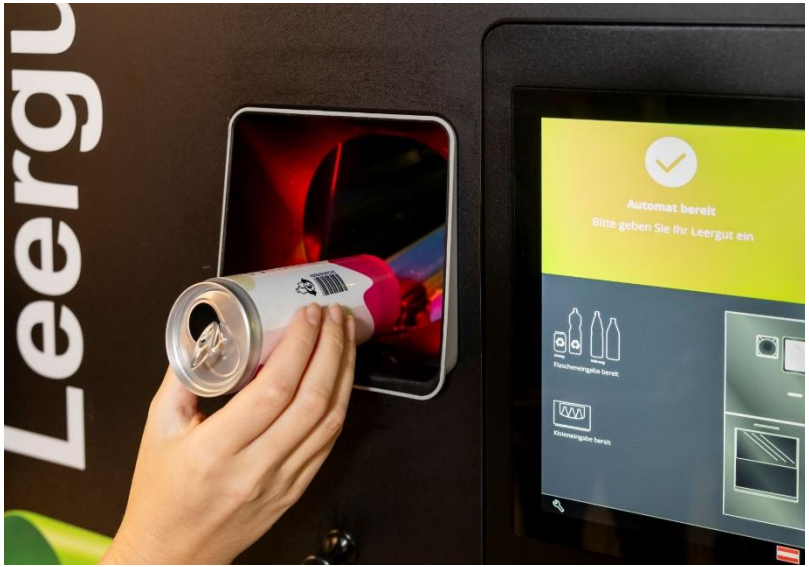


Treatment of all 67.2 million tonnes of waste in Austria

- Landfilling
- Material recovery (Recycling 36 %, Backfilling 20 %)
- Thermal treatment
- Treated by other ways (MBA, CP)

Source: Waste Management Inventory in Austria, Status Report 2025 for Reference Year 2023, BMLUK

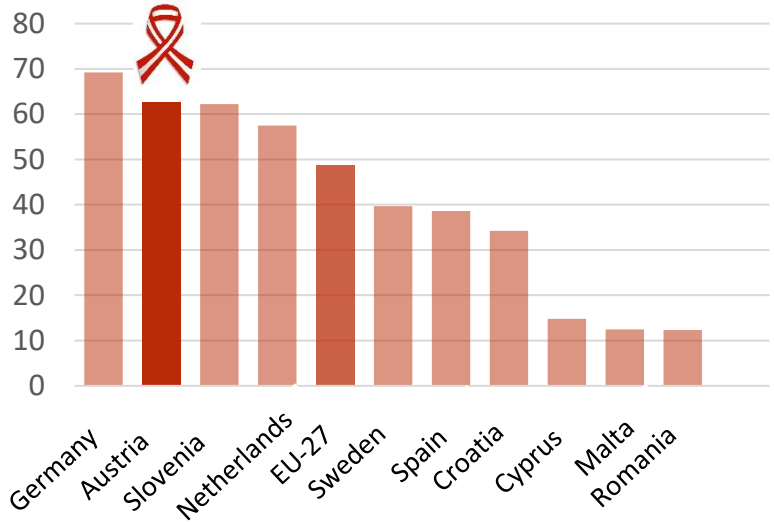
Extended Deposit System for Waste Prevention



Inserting can into return machine © EWP Recycling Pfand Österreich gGmbH

- Deposit system for beverage cans and bottles since 2025
  - Goal: 80 % collection rate by 2025
    90 % collection rate by 2027
- Austria-wide since 2025: Joint collection of plastic and metal packaging

Waste Management – Austria in Leading Field for Recycling in Europe



Extract from Waste recycling in Europe, European Environment Agency, Published 20.12.2024

Recycling rate for municipal waste in the EU in 2022

- Germany leads with 69.2 %
- Austria and Slovenia in 2nd place with 62.6 %
- EU-27 average: 48.7%

Turning Waste into Resources

© MA48

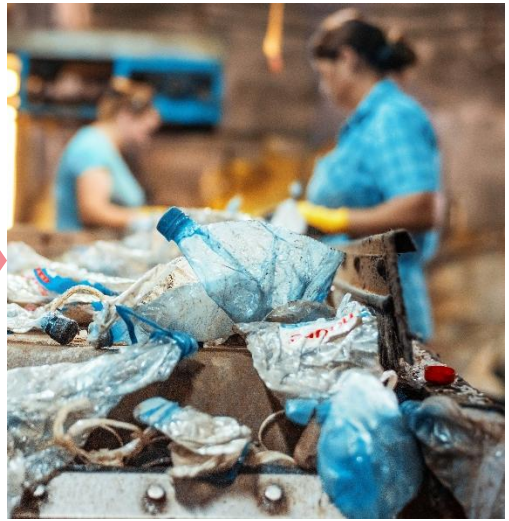


Photo: freepik, frimufilms

Separate collection of recoverable waste streams such as biogenic waste, packaging waste, construction waste, etc.

Success Stories: Innovations Emerge Through Funding

BIOCHAR: Plant-based biochar

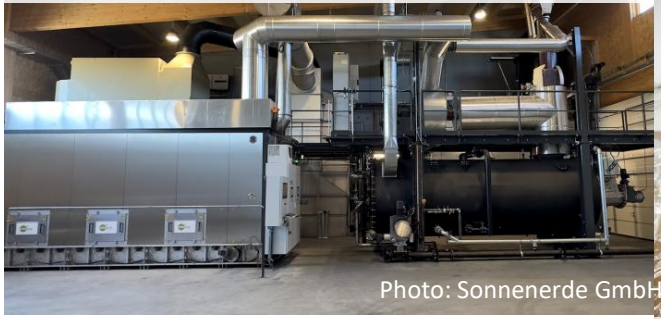


Photo: Sonnenerde GmbH

Photo: freepik, rawpixel.com

Photo: Sonnenerde GmbH

NutriCoal: Expensive waste becomes a valuable growing medium

Photo: plasticpreneur gmbh

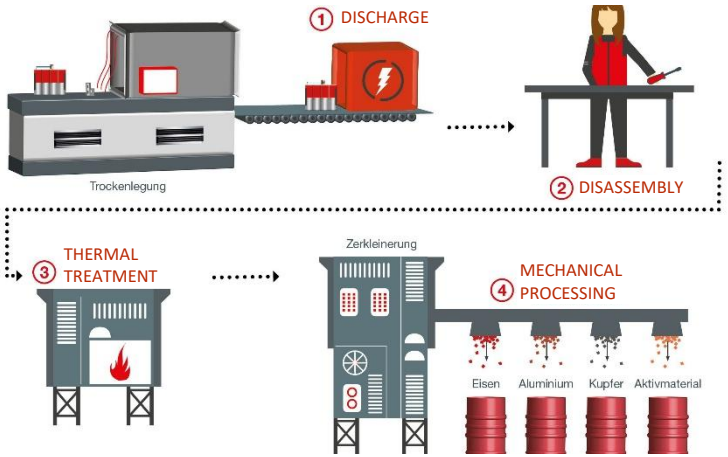
Plasticpreneur: Plastic recycling for everyone

EFFIE: Post-fossil stretch film for green logistics based on lactic acid

Photo: STFI, Schmidt

MC4: A second life for carbon and glass fibres

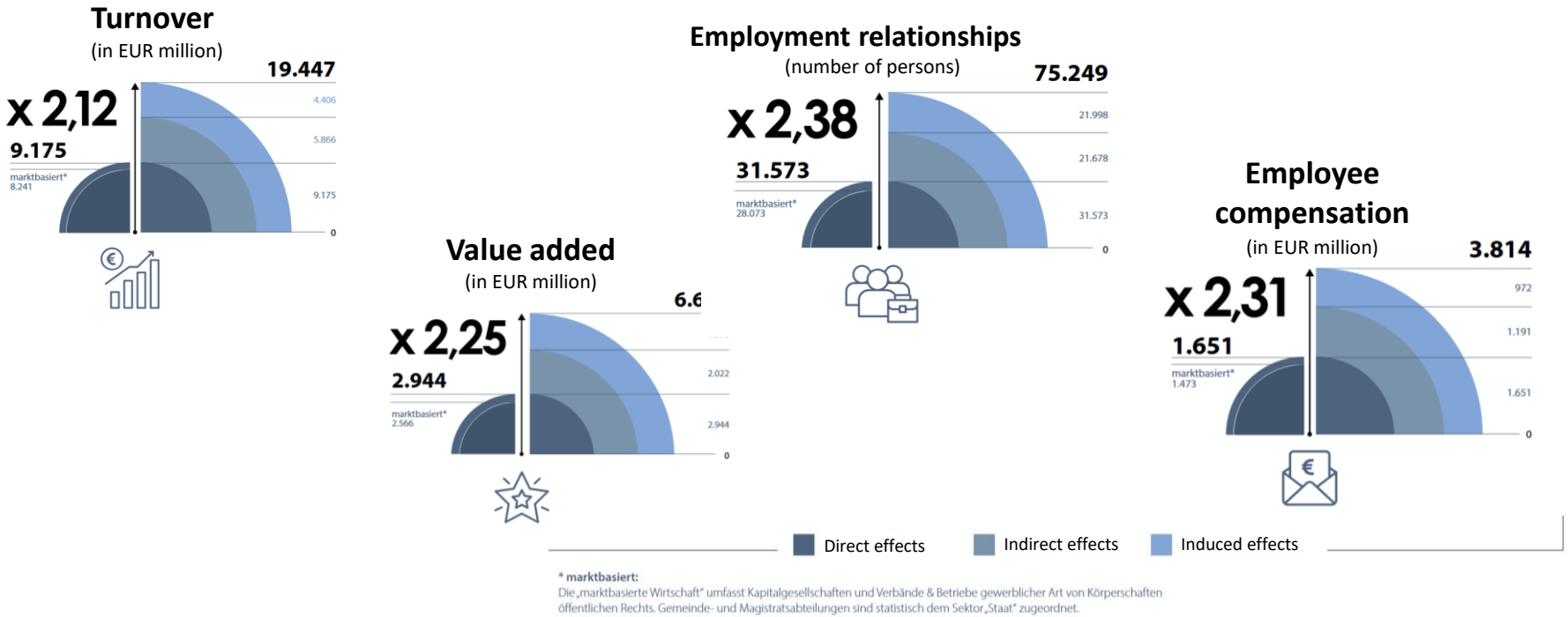
Battery Recycling



4 Steps of Battery Recycling © Saubermacher AG

- Continued use or recycling is subject of research and discussion
- Recycling is a major research topic
- B2B cooperation of Austrian companies
- State-of-the-art battery recycling plant with Austrian know-how makes Europe less dependent on raw materials

Economic Effects of Austria's Waste Management Industry



* **marktbasiert:**
Die „marktbasierte Wirtschaft" umfasst Kapitalgesellschaften und Verbände & Betriebe gewerblicher Art von Körperschaften öffentlichen Rechts. Gemeinde- und Magistratsabteilungen sind statistisch dem Sektor „Staat" zugeordnet.

Source: Waste Management Industry Profile, VOEB, 2024, based on data from IWI and Statistics Austria 2024

Waste Management Act Creates Successful Recovery System

Summer job waste and recyclable collection Photo © City of Vienna, Feelimage Matern

- Over 1.02 million tonnes of packaging and waste paper collected in 2024
- Austria achieves EU targets with 62.8 % recycling rate for municipal waste
- 400 waste advisors as a communication hub

Waste and Circular Economy Initiatives

Spring cleaning campaign, Photo © City of Vienna, Christian Jobst / PID

- Single-use deposit since 2025 with uniform 25 cents per bottle or can
- Repair bonus to curb electronic waste (by May 2025: 1.7 million vouchers redeemed by citizens)
- Spring cleaning campaign in public spaces
- Information initiatives such as "Austria Collects", "Bring Empty" (battery collection) and anti-littering campaigns

From Innovative Home Market to World Market Leader in Recycling Plants


© EREMA GmbH


© Binder+Co


© Komptech GmbH


© RUBBLE MASTER

- World market leader in plastic recycling machines
- World market leader in sensor-based sorting for recycling
- Global player in biomass shredding, separation and sorting
- World market leader in mobile crushing and screening plants for recycling, demolition, quarrying, mining and construction applications

Thermal Recovery and Energy Generation Instead of Landfilling

Pfaffenau waste incineration plant, Photo: © City of Vienna, WKU

- 12 waste incineration plants for municipal waste (also specifically for hazardous waste or sewage sludge) approx. 2.6 million tonnes/year
- 23 waste co-incineration plants
- Prerequisites: Appropriate legal principles and standards such as:
  - Waste Incineration Ordinance
  - Provisions for sampling, sample preparation and analysis

Water Pollution Control

Best drinking water and clean rivers and lakes thanks to state-of-the-art technology

Graphic: pch.vector, Freepik

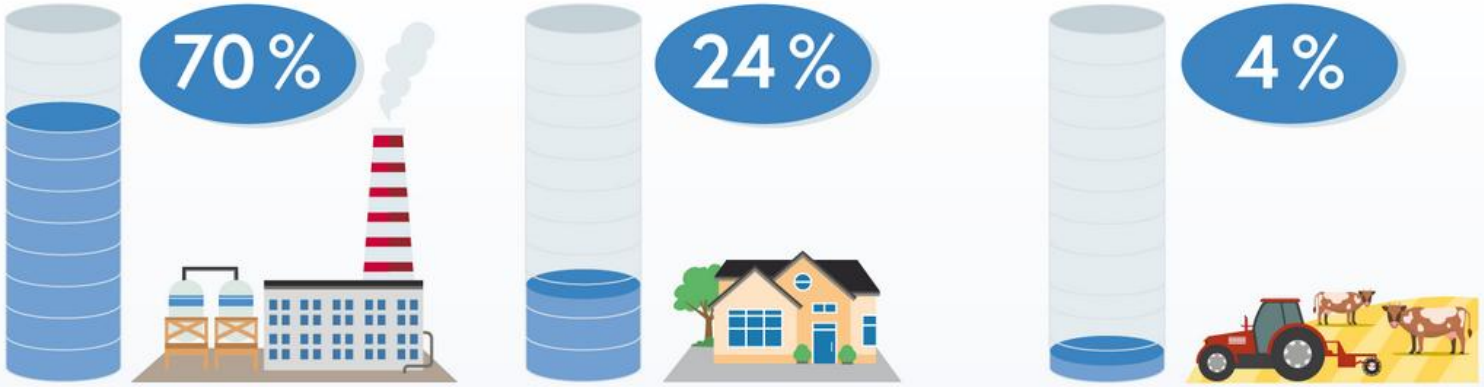
Legislation Secures Outstanding Quality and Provides Economic Stimulus

Photo © BMLUK / Max Slovencik

- Comprehensive measures for water protection since 1960
- € 305 million funding in 2024 for municipal water management, aquatic ecology, flood protection & research
- Know-how built up in Austrian companies and new technologies developed in line with strict legislation
- Approximately 19,000 Green Jobs in municipal water management, aquatic ecology and flood protection

Use of Water Resources in Austria

Study: Austria's Water Resources, 2021, BMLUK



Water as a Resource: Responsibility and Innovation for Best Quality

Traunsee, Photo: 8moments/Pixabay

- Bathing water quality EU ranking: 2nd place
- Water and wastewater technology ranks 2nd (environmental technology services) and 3rd (ET industry) measured by turnover shares in Austria
- Drinking water supply: 58 % from springs / 42 % from groundwater
- 96 % of the population is connected to the public sewer network
- More than 600 municipal treatment plants (> 2,000 PE) treat the wastewater
- Total length of public sewerage: 94,000 km
- Removal rates: 95 % COD, 91 % phosphorus, 81 % nitrogen
- Sewage sludge generation: 195,500 tonnes DS/year

Water Abundance Can Become a Hazard

Natural hazards experience days Ennstal © BMLUK

- Two centennial floods in 2002 and 2013 with highest Danube water level in 2013
  - Increasing threat to Austria from climate change
- Damage in 2013 significantly lower through forward-looking risk management
  - Protective structures are closely coordinated with neighbouring states
- 3,492 jobs directly connected to these measures
- "Future flood protection 2024+" with 10-point action programme

Air Pollution Control

Designed by Freepik

Air Pollution Control – A Significant Economic Factor in Austria

Lavanttal, Carinthia, Photo: Liggraphy via pixabay

- Air pollution control and climate protection as economic factor
  - 4th largest environment-related production value of € 4,524 million
  - € 1,593 million environment-related gross value added
  - 18,700 people employed
  - 15 % of exports (€ 3,110 million) in the Austrian environmental economy
- Funding for air pollution control measures
- Austrian companies offer a wide range of solutions
  - Catalysts and filter systems, catalytic aftertreatment systems, ventilation systems, thermal afterburning processes, emission reduction processes and particle filters for cleaning exhaust air from various industrial processes, emission testing for vehicles

Industry and Clean Air Go Hand in Hand

RHI Magnesita Plant Hochfilzen: Rendering of the CCU testing facility. Credit: RHI Magnesita

- RHI Magnesita and startup MCi Carbon advance construction of world's first CCU plant in refractory industry in Austria
- ANDRITZ expands CO_2 capture with HPC technology
- 150,000 tonnes CO_2 savings through CTP nitrous oxide reduction plant
- voestalpine DeNOx plant, Europe's cleanest sintering plant

CO_2-Reduced Premium Steel

Photo: freepik, fanjianhua

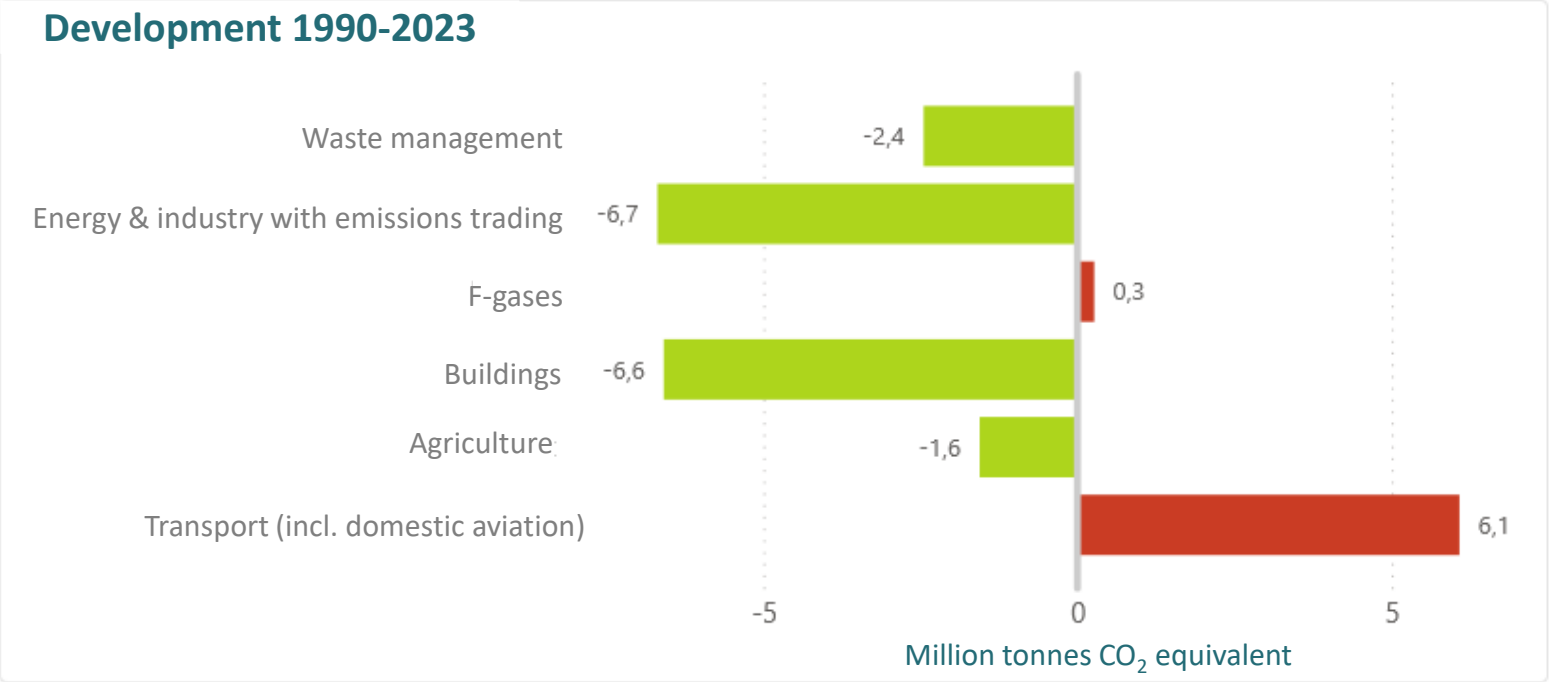
- Next generation of steel production
- 2023: Start of construction of voestalpine green steel in Linz and Donawitz
- From 2027: Commissioning of electric arc furnaces
- By 2029: 3-4 million tonnes $CO_{2\ savings}$/ year
- From 2030: Additional blast furnaces
- By 2050: Net-zero CO_2 emissions in steel production

Air Quality Shows Success of Austrian Environmental Policy

Measuring station Taborstraße Vienna © City of Vienna - Environmental Protection

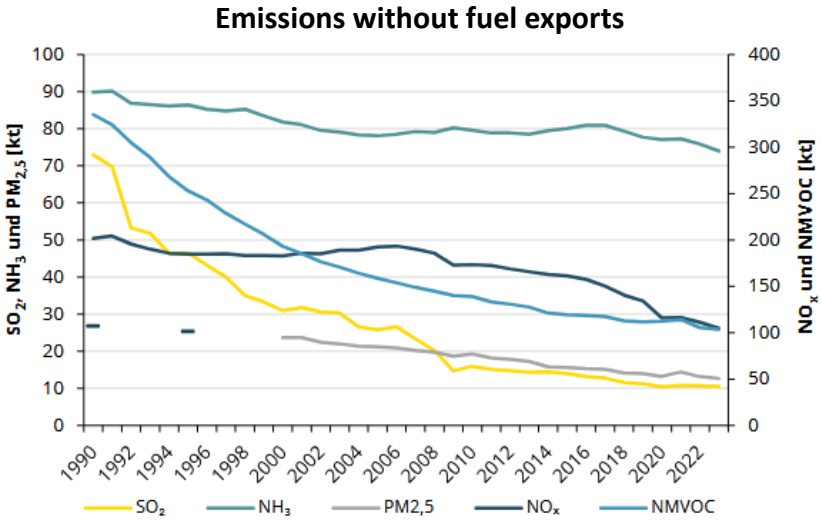
- Annual air quality measurement by Environment Agency
- Austria Initiatives such as "Phase-out Oil and Gas", "Energy.Free.Space", "World Clean Air Day" by BMLUK, klimaaktiv mobil
- Immission Control Act-Air (IG-L), Emission Act-Air (EG-L), Emission Act for Boiler Plants (EG-K)

Greenhouse Gas Emission Trend 1990-2023



Greenhouse gas emission trend 1990 to 2023 on https://www.umweltbundesamt.at/klima/dashboard, as of 05.06.2025

Best Air Quality – Significant Decrease in Emissions



Quelle: Umweltbundesamt

umweltbundesamt

Source: Austria's Annual Air Emission Inventory 1990-2023, Environment Agency Austria

- Sulphur dioxide (SO_2), nitrogen oxides (NO_x), ammonia (NH_3), fine particulate matter ($PM_{2.5}$) and non-methane organic compounds (NMVOC)
  - Binding limitation within EU member states
- Successful measures: Reduction from 1990 to 2022 in Austria:
  - Sulphur dioxide: -86%
  - NMOVC: -69%
  - Ammonia: -17%
  - Nitrogen oxides: -50%
  - Fine particulate matter: -53%

Noise Protection in Austria

Photo: Designed by freepik, AI-generated

- Main noise source: Road traffic
- Austria's strategic noise maps
- Action plans with citizen participation
- EU environmental noise legislation
- Funding for noise protection measures
- Technologies and research including noise barriers with solar power plant in Vienna-Meidling

St. Wolfgang, Salzkammergut, Photo: Leonhard Niederwimmer

Thank you for your attention!

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Heldenplatz Vienna
Photo: andreas N alias domeckopol