

THE MAGAZINE

FOR PARTNERS AND CLIENTS



APRIL 2024

Transform Industry

Four scenarios for
a climate-neutral industry

Offensive against deepfakes

New project against image and
video manipulation

Austrian Startup Monitor

Blueprint of the domestic
start-up scene

Technology Talks Austria

After 40 years as part of the Forum
Alpbach, the Technology Talks are
now reinventing themselves

Die neuen Technologie- gespräche

Technologie für die Triple Transition:
ökologisch, digital, human.

12. – 13. September 2024
Museumsquartier Wien

technology-talks-austria.at



Jetzt schon
unverbindlich
Ticket sichern!



Andreas Kugi (Scientific Director), Brigitte Bach (Spokeswoman of the Management Board) and Alexander Svejkovsky (Managing Director for Finance, Processes and Administration) form the new management team of the AIT Austrian Institute of Technology (f.l.t.r.).

THE BEST SOLUTIONS ARE FOUND TOGETHER!

Research and technology are the most important drivers of innovation. We want to make the AIT Austrian Institute of Technology, Austria's largest research and technology organization, even more effective and react even faster and more purposefully to the challenges of the future. The best solutions are always created together - through intensive cooperation between research, development and application. With its current 1,527 highly qualified and motivated employees, the AIT builds bridges between basic research, which typically takes place at universities, and the development of innovations by industry. We conduct research where the need for innovation is greatest. We are experiencing great demand for this. And the fact that we have well-established networks can be seen from the fact that the AIT is among the top three in Austria in the EU research framework program HORIZON EUROPE. We want to strategically expand this cooperation in the near future. We are focusing on our two strategic areas of strength "sustainable and resilient infrastructures" (including energy systems of the fu-

ture, sustainable mobility, selected areas of the healthcare system) and "digital transformation of the economy and society" (including cybersecurity, innovative automation, human-machine interaction). This technological expertise is complemented by deep insights into systems and transformation processes. Today, R & D is only conceivable with artificial intelligence (AI). A major focus these days is therefore AI, which we are currently strengthening significantly, for example by setting up our own AIT AI task force. By focusing and building up expertise and critical mass, we are in a position to provide answers to the big questions of the future - in the service of our partners and customers from industry and the public sector. And thus also for Austria as a business location. We would like to thank you for the many years of partnership and look forward to further intensifying our collaboration! Let's work together to bring research, development and innovation to a new level of effectiveness. **Brigitte Bach, Andreas Kugi, Alexander Svejkovsky**

Foto: AIT/Johannes Zimmer

SCENARIOS FOR THE DECARBONIZATION OF INDUSTRY IN AUSTRIA

Four different paths were designed in the "transform.industry" project, how Austria's industry can become climate-neutral by 2040.

Industry is responsible for a third of Austria's greenhouse gas emissions and is therefore a key element in achieving the goal of climate neutrality by 2040. "The transform.industry project provides answers to the question of how the transformation of industry in Austria can best be shaped," explains Brigitte Bach, spokesperson for the AIT's Management Board. The study was carried out by AIT, the AEA Austrian Energy Agency, the Chair of Energy Network Technology at the University of Leoben and the Energy Institute at the Johannes Kepler University Linz on behalf of the Climate and Energy Fund. "The solutions identified in the study all contribute to achieving Austria's 2040 climate target," explains Christian Schützenhofer, project coordinator at AIT. Specifically, the following four fundamentally different scenarios were developed, each of which enables the decarbonization of industry:

- **Renewable gases:** Increased provision of renewable energies (especially renewable gas). The existing infrastructure can continue to be used.
- **Circular economy:** higher material efficiency and recycling rates to minimize the production of raw materials.
- **Innovation:** New technologies enable more energy-efficient production processes.
- **Sector coupling:** Optimization through cascading use of energy. Subsequently, it was determined which energy sources are required for this and what effects the scenarios have on investments, infrastructure and the economy. In summary, the following picture emerges: By 2040, the energy source requirements of industry will increase by 15 to 24 percent from the current level of

around 115 terawatt hours (TWh) to 132 to 144 TWh - with the highest value resulting from the "Renewable gases" scenario. In general, two paths to decarbonization can be identified, based either on renewable gases or on a mix of electricity, hydrogen and waste heat. Overall, the main pillars of future energy demand are electricity and renewable gases, which together account for two thirds to three quarters of consumption. This will require investments of 17.4 to 24.4 billion (cumulative by 2040) are required for this, which will trigger positive economic effects: The gross domestic product increases by eight to eleven billion euros annually and an employment effect of 163,000 to 193,000 jobs.

AIT AT LANGE NACHT DER FORSCHUNG

In 2024, the AIT will once again be showcasing the latest developments at the Lange Nacht der Forschung (May 24, 5 p.m.). A centerpiece of the show in "Cape 10" (Alfred-Adler-Straße 1) is the AIT Mobility Observation Box, which measures the safety of traffic infrastructures. Also on display will be technologies for the automated detection of fake news, the AI4Trees project, the Med1stMR training system for emergency services and batteries of the future. In Tulln, the AIT will be focusing on climate protection, in Ranshofen on lightweight materials.

Foto: AIT [2]





The Technology Talks have been the key meeting place for the Austrian technology community for 40 years. Key future issues relating to research, technology and innovation are discussed here - with a European and international focus.



After many years as part of the Alpbach Forum, the Technology Talks are now being held in Vienna for the first time, and in subsequent years at other central locations in Austria.

TECHNOLOGY TALKS IN NEW FORMAT FROM THIS YEAR

The summit meeting of the Austrian technology community will take place this year on September 12 and 13, September 2024 in the Museumsquartier Vienna. The main topic is the role of RTI in the "Triple Transition".

First held in 1983 as part of the European Forum Alpbach, the Technology Talks have developed into the most relevant technology conference for Austria as a location for research and innovation. After 40 successful years in Alpbach, the Technology Talks are now reinventing themselves as "Technology Talks Austria": starting with Vienna - on September 12 and 13, 2024 in the Museumsquartier Wien (back-to-back with the FFG Forum on September 11) - the summit meeting of the Austrian

technology community will take place in central Austrian locations on a rotating basis each fall from this year onwards. With a strong European and international focus, technology trends will be discussed, breakthrough innovations identified and current issues of international, European and national RTI policy discussed. "The Technology Talks offer a discussion platform with all relevant partners in the domestic and European RTI landscape," emphasizes Brigitte Bach, Spokesperson of the Management

Board of the AIT Austrian Institute of Technology and Chairwoman of the event's Board of Trustees.

These topics, which play a key role in determining the future of Austria as a business location, will be addressed in an innovative mix of different formats - from concise keynotes by internationally renowned speakers to interactive formats for more exchange and workshops as well as intensive immersion in topics and RTI community events for networking.

Foto: Mr. Mockup; Montage: message

Technologien for the Triple Transition: ecological, digital, human

The main theme of the Technology Talks 2024 is the role of technologies in the "triple transition" - the simultaneous "green" and digital transformation, which should be socially just. "This transformation presents society, the public sector and companies with major challenges, but also opportunities," explains Andreas Kugi, Scientific Director of AIT and Chairman of the Program Advisory Board.

The transformations raise many questions - such as: What role do technologies have in transformation processes? What breakthroughs can be expected in artificial intelligence? What

role do people play in the transformation of socio-technical systems? Are we still lacking technologies for the "green" transformation? Based on this, conclusions for international, European and Austrian RTI policy will be discussed and drawn.

Concise keynotes by internationally renowned experts on the various topics of the "Triple Transition" are planned, which will be discussed in detail in dialog formats with regard to their significance for RTI policy. Developments in RTI policy in Europe and worldwide will be presented and debated in two special panels. In addition, workshops will be held together with partners to enable a more intensive examination of the various aspects of the main topic or to deepen complementary subject areas. There will be plenty of space and time for networking during breaks and at the traditional AIT garden party. All events will take place in close proximity to the Museumsquartier Wien, which will be transformed into a veritable research and innovation campus for two days in September.

Would you also like to be a partner of Technology Talks 2024?

We have put together a range of partner packages. Send us an e-mail to technologytalks@ait.ac.at

Partners of the Technology Talks Austria

The Technology Talks Austria are organized by the AIT Austrian Institute of Technology in close cooperation with

- **BMK** (Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology)
- **BMBWF** (Federal Ministry of Education, Science and Research)
- **BMAW** (Federal Ministry of Labour and Economy)
- **IV** (Federation of Austria's Industry)
- **FFG** (Austrian Research Promotion Agency)

Scientific Partners

Numerous scientific organizations are involved in the programme advisory board, such as

- **TU Austria** (TU Wien, TU Graz, Montanuniversität Leoben)
- **acatech** (German Academy of Science and Engineering)
- **Austrian Academy of Sciences** (ÖAW)
- **Christian Doppler Society** (CDG)
- **Institute for Science and Technology** (IST) Austria
- **Forschung Austria** (Joanneum Research, Salzburg Research, Silicon Labs Austria, Austrian Cooperative Research, Forschung Burgenland, Upper Austrian Research)
- **AIT Austrian Institute of Technology**

More Information: <https://technologytalks.ait.ac.at>

FOCUS ON PERFORMANCE

Geothermal heating and cooling networks in Upper Austria



The AIT-led NEFI project CASCADE is researching geothermal potential in the industrial, commercial and residential sectors. In Steyr, Gmunden and St. Martin im Mühlkreis, the method of step-by-step heat utilization will be investigated in the period from 2024 to 2025 and the thermal energy generated by geothermal energy will be used in stages or "cascades" for various purposes. This starts with industry with its usually high temperature requirements and extends to low-temperature applications, for example for heating buildings. "The project demonstrates the high potential for a local, decarbonized heat supply with geothermal energy for the first time using three specific use cases in Upper Austria," explains Edith Haslinger, project manager for CASCADE at AIT. The gradual use of heat increases overall efficiency and reduces energy consumption. Geothermal energy can make an important contribution to achieving climate targets in order to meet the high energy requirements of industry, commerce and households. In the project, for example, the heat from the earth is first used to process milk in the Gmunden dairy, with the residual heat then being fed into the Gmunden heating network.

www.nefi.at/de/projekt/cascade

Maximum range thanks to efficient thermal management



In addition to the battery capacity and the efficiency of the drivetrain, external conditions also play a decisive role in the range of electric vehicles. This applies in particular to the outside temperature: comfortable air conditioning can require a lot of energy. In the AIT-led European research project "MINDED" (Thermal and energy Management for INcreased Driving range of an Electric minibus including improved user-centric Design and thermal comfort), a top-class European consortium is developing highly efficient heating panels, innovative thermal management including AI and solutions for optimized user:interior comfort. The kick-off of MINDED with a total of eleven European partners from research and industry took place at the end of January at the AIT headquarters in Vienna. The aim is to develop an innovative battery-electric "IVECO eDaily minibus" that offers around 20 percent more range at an ambient temperature of 0°C. 20 percent more range at an ambient temperature. To this end, extremely efficient infrared heating panels are installed in the vehicle, which achieve greater comfort at lower temperatures (up to 5°C) than with conventional PTC heaters thanks to the pleasantly perceived radiant heat. There is also a particular focus on the development of a new type of air conditioning system with heat pump mode (based on an oil-free compressor), which aims to increase efficiency at all times of the year.

www.nefi.at

Robot mowers for maintaining road embankments



In the FFG project SMARTER (Slope Maintenance Automation using Real-Time Telecommunication and advanced Environment Recognition), AIT and its partners are presenting a pioneering demonstrator for efficient and safe applications in infrastructure, municipalities and logistics. "Our vision is to develop autonomous machines that relieve humans of heavy, monotonous and dangerous work," explains Manfred Gruber, Head of Assistive & Autonomous Systems at AIT. A robotic mower for working on road embankments was developed as a demonstrator. A prerequisite for autonomously operating systems is reliable environment recognition and navigation, even in difficult conditions such as high grass. To achieve this, software, sensors, algorithms and hardware must be perfectly coordinated. Powerful communication technology enables immediate real-time intervention by a supervising person in an emergency. The robotic mower consists of the automated "Metron" platform, to which a mowing machine is connected. Depending on the task, it can also be used to clear snow or for logistics. According to IT project manager Oliver Zedel, the intelligence of the autonomous systems can be continuously increased through machine learning thanks to extensive image data from street scenes and from the open field.

Fotos: NEFI, IVECO, Linz AG

Success for AIT innovation database



The most renowned journal for empirical science tools, Nature Scientific Data, recently published an article on the EUPRO database developed at AIT. In it, EUPRO was presented as an international standard and a central reference in the field of empirical innovation research for the analysis of project-based R&D activities and networks. Not only were the authors Thomas Scherngell, Michael Barber, Anna Wolfmayr and Xheneta Bilalli-Shkodra involved in the development of the database, but the important database is the result of almost 15 years of development work at the AIT Center. 15 years of development work at the AIT Center for Innovation Systems & Policy. The EUPRO database enables the analysis of participation patterns of organizations in and across various European R&D funding initiatives. Subsequently, the resulting collaborative R&D network structures and dynamics can be created. EUPRO currently includes more than 600,000 R&D projects funded by European (EU, transnational or national) research funding organizations and contains systematic information on the content of the R&D projects (such as their contributions to the Sustainable Development Goals), their participating organizations (including organization type and location) and a number of additional characteristics (e.g. underlying policy instrument and programme).

<https://www.nature.com/articles/s41597-024-03129-y>

Fotos: AIT, Gettyimages, Projekt Defame Fakes

Environmentally friendly plant protection



The EU project SAGROPIA (Sustainable Agriculture through Novel Pesticides Using an Integrated Approach), coordinated by AIT, is researching new ways to combat pests using bio-based pesticides. The five-year project will take an important step towards reducing the use of chemical pesticides in agriculture. At the beginning of the year, the foundation was laid to promote a more sustainable agricultural economy in Europe through the development of bio-based pesticides. The widespread use of chemical pesticides in agriculture has shown increasingly negative environmental and health impacts. The EU "Farm to Fork" strategy therefore calls for a reduced reduction of these funds. The SAGROPIA project takes the approach of replacing conventional chemical pesticides with bio-based and low-risk alternatives. By developing and using these pesticides in potato and sugar beet production, the project aims to reduce the use of chemicals by 50 percent while at the same time ensuring yield quality and quantity. The consortium consists of ten partners from eight countries, including seven EU member states and the USA. Under the scientific coordination of Günter Brader from the Competence Unit Biore-sources, AIT contributes its expertise to the development and testing of new bio-based pesticides with the aim of making a contribution to resilient and climate-neutral agricultural production.

www.rtds-group.com/services/sagropia

Fight against Deep fakes



The new KIRAS security research project "defame fakes" led by AIT aims to better detect and combat deep fakes in digital image and video content. Technologies and applications for manipulating videos and images such as DALL-E 3, face filters on TikTok and Instagram or DeepFaceLab are booming and easy to use. Whether authorities, administration, media organizations, the private sector or civil society: everyone is confronted with the challenges and dangers posed by deep fakes. The project, coordinated by specialists in artificial intelligence and image and video analysis at AIT, researches and develops tools for the supporting semi-automated detection of deep fakes in large data sets in order to protect companies and society from manipulation. Preventive awareness measures should also initiate a discourse across society and raise awareness of the problem, particularly when dealing with digital information. This is intended to strengthen trust in digital media. The APA Austria Press Agency, PwC Austria, KSÖ Competence Center Safe Austria and the ÖIAT Austrian Institute for Applied Telecommunications are also involved in the interdisciplinary project. The project's beneficiaries are the Federal Ministry of the Interior (BMI) and the Federal Ministry of Defense (BMLV).

www.defamefakes.at



Martin Kocher, Minister of Labour and Economy, presented the Austrian Startup Monitor 2023, which was developed under the leadership of AIT together with partners.

GROWTH ENGINE STARTUPS

Austria's approximately 3,400 startup companies showed remarkable resilience in a challenging environment in 2023: Despite the significantly more difficult business situation and financing environment, the startup sector has 30,000 employees for the first time and is becoming increasingly profitable. This emerges from the Austrian Startup Monitor 2023, which was developed under the leadership of AIT researcher Karl-Heinz Leitner together with Austrian Startups and the start-up center at WU Vienna. "For the resilience of our eco-

nomy, it is important to reduce technological dependencies and strengthen domestic and European supply chains. Startups make a significant contribution to this," emphasized Martin Kocher, Federal Minister of Labor and Economic Affairs, at the presentation of the Austrian Startup Monitor. The AIT is also very successful in spin-offs: five startups have been founded in the last two years alone. "We encourage all AIT researchers to think entrepreneurially when exploiting their results," explains AIT Managing Director Alexander Svejksky.

"RESEARCH IS THE CENTRAL ONE INNOVATION DRIVER"

At the Salzburg technology and innovation forum "salz21", Brigitte Bach, spokeswoman for the management of the AIT Austrian Institute of Technology, explained how the research organization produces innovations, drives transformation processes and thus supports Austria as a business and innovation location. "Research is the central driver of innovation for the economy," said Bach. The conference was attended by, among others: Wilfried Haslauer (Salzburg Governor), Eric Beißwenger (Bavarian State Minister), Claudia Plakolm (State Secretary in the Federal Chancellery), Henrietta Egerth (FFG) and Henriette Spyra (Ministry of Climate Protection) also took part. AIT researchers also hosted a panel on "Industry 5.0: Human Centered Future Tech" in which Tobias Glück, Markus Murtinger and Manfred Tscheligi discussed the future of production.



EUROPE'S QUANTUM TECHNOLOGY COMMUNITY

The AIT Austrian Institute of Technology invited the European quantum technology community to the QCI Days for the first time at the House of Industry in the Industrial Association (IV) in Vienna - with a total of 62 speakers and around 350 participants from all over Europe. The event was organized in the context of the EU project QCI-CAT coordinated by AIT. "After many years of successful basic research, for which Austria also received a Nobel Prize, Austria as a location for experts can also boast successful industrial expertise," said Andreas Kugi, Scientific Director of the AIT at the opening. This is an exemplary example of



Christoph Neumayer (Secretary General, IV), Andreas Kugi (Scientific Director, AIT) und Georg Niklfeld (FFG; v.l.n.r.).

the close cooperation between universities and research institutions with companies and industrial organizations as well as support from the public sector.

Eigentümer und Herausgeber: AIT Austrian Institute of Technology, Corporate and Marketing Communications, Giefinggasse 4, 1210 Wien / **Coverfoto:** AIT / **Redaktionsleitung:** Michael H. Hlava, Martin Kugler / **Redaktionsteam:** Beatrice Fröhlich-Rath, Florian Hainz, Iman Kulitz, Michael Mürling, Margit Özelt, Daniel Pepl, Fabian Purtscher, Christine Wahlmüller-Schiller, Michael Wöss / **Produktion:** Verlag Holzhausen GmbH / Repromedia GmbH / **Design:** WHY.Studio / **Druck:** Donau Forum Druck Ges.m.b.H., 1230 Wien / **Feedback bitte an:** presse@ait.ac.at

Stay in contact!

Melden Sie sich zum **AIT-Newsletter** an – wir informieren Sie regelmäßig über Neuigkeiten aus dem AIT



www.ait.ac.at www.ait.ac.at/blog