

# 2019 ANNUAL FINANCIAL STATEMENT



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# SHAREHOLDERS

## REPUBLIC OF AUSTRIA

Austrian Federal Ministry of Transport, Innovation and Technology  
 (as of 29 January 2020 renamed into Federal Ministry for Climate Action,  
 Environment, Energy, Mobility, Innovation and Technology)  
 with 50.46%

## ASSOCIATION FOR THE PROMOTION OF RESEARCH AND INNOVATION

(Federation of Austrian Industries)  
 with 49.54%

# CORPORATE BODIES

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 Prof. Dr. Wolfgang KNOLL

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 Prof.<sup>in</sup> Dr.<sup>in</sup> Elke GUENTHER  
 DI Dr. Wolfgang HRIBERNIK  
 DI Arno KLAMMINGER  
 DI Helmut LEOPOLD  
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 DI<sup>in</sup> Christina TAMAS until 20 May 2019 / from 8 July 2019  
 DI (FH) Hubert UMSCHADEN  
 Dr.<sup>in</sup> Eva WILHELM  
 Stefan WYHLIDAL from 21 May 2019 to 7 July 2019

# STRUCTURE REPORT AND ORGANIZATION CHART

Although the organizational structure of the AIT is – essentially unchanged – divided into eight Centers, there have been adjustments within the Centers.

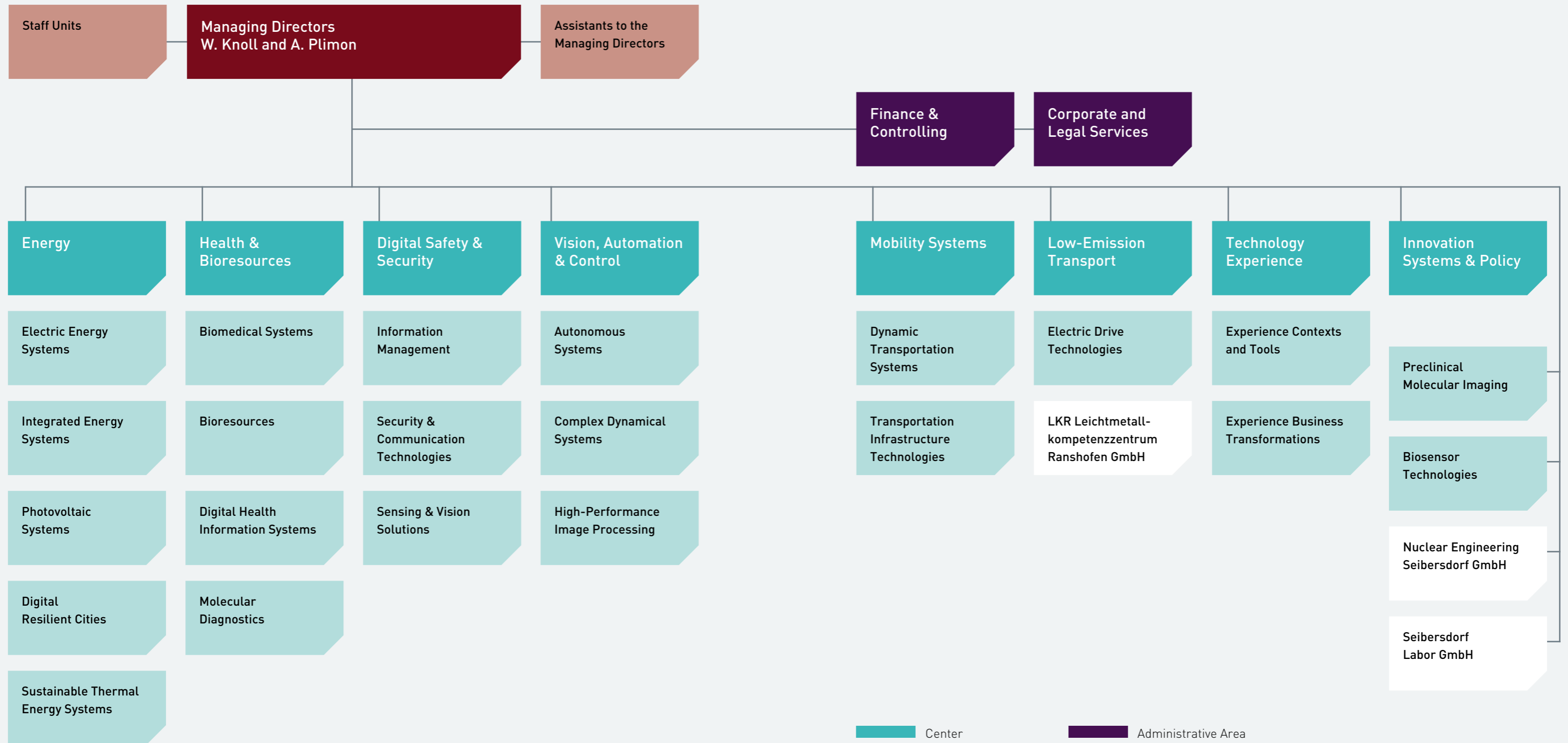
At the Center Energy, the new Competence Unit, Integrated Energy Systems, focuses on questions regarding the flexibility of prosumers in short-term electricity markets, taking distribution networks into account. Parts of the Electric Energy Systems Competence Unit have been assigned to the new Integrated Energy Systems Unit.

The Technology Experience Center will, in its Competence Unit Experience Business Transformation, in the future focus even more on advising organizations on the implementation of specific projects in the user experience context. Innovation and implementation experience of the employees of the Experience Business Transformation Unit combined with the scientific expertise of the Competence Unit Experience Context and Tools should contribute to better a market anchoring for the Center.

The Business and Start-up Coaching position was refocused in the year under review to set up a regulated process to support AIT start-up initiatives, to integrate network partners in a structured manner, and to offer appropriate support to AIT start-up entrepreneurs. The position was assigned to the Administrative Area Finance & Controlling.

# AIT ORGANIZATION CHART

January 2020



- Center
- Administrative Area
- Competence Unit
- Administrative Unit
- Legal Entity

# REPORTS FROM THE CENTERS

## ENERGY

2019 saw the continuous implementation of the Center strategy with a focus on the three strategic target domains: sustainable energy infrastructure, industrial energy systems, and cities and built environment. An important focus of the Center chair was on the further development of the research teams with regard to their scientific profile. Seven employees successfully completed the Senior Hearing, thus strengthening the activities of the research fields with their specific professional profiles and networks. Furthermore, as part of the organizational design, the decision was made to spin off a new Integrated Energy Systems Competence Unit from an existing research field in order to give visibility and management attention to the strategic importance of the topic in the energy policy context.

A key milestone for the Center in the area of research infrastructure was the opening of the City Intelligence Lab (CIL) in September 2019. This unique digital platform, located in the Competence Unit Digital Resilient Cities, makes it possible to explore innovative and radically new forms and processes of urban planning based on Artificial Intelligence and to interactively involve the relevant stakeholders and residents. The CIL has already been methodologically applied and utilized in two international projects (Uzbekistan, IBA Heidelberg). Furthermore, plans for the expansion of the

DC-Lab as an extension of the SmartEST could be pushed ahead. The focus here is on the development of new methods to test and validate components of DC networks at medium and low voltage levels. Completion is scheduled for the end of 2020, with the aim of strengthening domestic developers and manufacturers of power electronic components in the global competition. Detailed engineering for the high-temperature heat pump lab is nearing completion and the lab is scheduled to open in early 2021.

The first steps were taken in the strategic expansion of the Center portfolio in the field of hydrogen. Hydrogen and other synthetic gases are viewed as promising energy carriers in the area of sector coupling, which is also reflected in the national and European political commitment to this topic. A national hydrogen strategy with content participation on the Center's part is currently being developed. The goal for 2020 is to take up technological options in the field of hydrogen in a well-founded way and to anchor them in the Center portfolio as part of the strategic research programme. At the same time, there are promising project developments with industrial players which must be further pursued. Accordingly, the European networks were also expanded by joining of Hydrogen Europe Research.

### Portfolio development highlights 2019

2019 saw the successful launch of the model region New Energy for Industry (NEFI), supported by the Climate and Energy Fund chaired by the AIT Center for Energy in cooperation with the Montanuniversität Leoben, the Upper Austrian Energy Saving Association and the Business Upper Austria Agency. In an innovation network with more than 80 companies from industry, technology providers and research, the aim over the next eight years is to demonstrate the path to renewable energy supply and thus complete decarbonisation of the producing and energy-intensive industry using key technologies "Made in Austria". The spectrum of companies involved in NEFI ranges from large leading companies to innovative SMEs. The governments of the industrially strong provinces of Upper Austria and Styria stand behind the strategic programme and are prepared to substantially support its development. Furthermore, NEFI focuses on six fields of innovation at both technological level (e.g. renewables, energy storage, processes) and systemic level (infrastructure, business models, policy). In 2019, ten scientific projects have already been launched (seven of them with Center participation), with further submissions to follow in early 2020. The establishment of an internationally staffed scientific advisory board ensures a high degree of innovation and scientific excellence in the selection of implementation projects. The Center has thus succeeded in strategically positioning itself as a scientific lead in the field of industrial energy systems and the associated funding landscape.

In 2019, significant contract research projects could be implemented in the field of Integrated Energy Systems with strategically important stakeholders. During the studies carried out, the Center's wide-ranging modeling expertise was used to examine specific development scenarios, technology paths and the resulting requirements for energy infrastructure. The basis for this scientific work is Austria's commitment to a 100% electricity supply with renewable energies by the year 2030 (#mission2030). The project RES100Speicher, for example, dealt with the future role of storage systems in Austria's electricity system for the provision of short- and medium-term flexibility as well as for seasonal balancing from a techno-economic perspective. As part of the IndustriES study, the supply of Austrian industry with (balance sheet-related) 100% renewable energy was analysed and concrete requirements for the energy infrastructure (generation, storage and transmission capacities) were derived. Following from this, the decarbonisation project in Austria, in cooperation with the Austrian Energy Agency, examined in greater detail which specific technologies and energy sources are required to promote the decarbonisation of Austrian industry. In doing so, the opportunities and risks in Austrian industry and the resulting effects for Austria were also discussed on a scientific basis. Through these projects, the visibility of the Center for Energy in the national energy policy context was significantly increased and the methodological competence was translated into successful exploitation.

# REPORTS FROM THE CENTERS

## HEALTH & BIORESOURCES

The Center for Health & Bioresources directs its research and the development of innovative solutions towards two fields of innovation. On the one hand, the Center develops solutions for the healthcare system, focusing on prevention, diagnostics and therapy support in doing so. This also includes development work and innovative solutions for the lifestyle market and for the animal health sector. The Center furthermore develops solutions in the area of bioeconomy with the aim of improving crops and microbial production systems. With its four Competence Units – Molecular Diagnostics, Biomedical Systems, Digital Health Information Systems, and Bioresources – the Center contributes its research and development expertise to both fields of innovation, drawing on its core competencies in the fields of Omics technologies, Big Data and imaging processes, biomaterial, nano and sensor technologies, modelling and simulation, as well as its in-depth knowledge of regulatory markets. The research and development competencies are further developed along the value chain in a targeted manner so as to create added value for our customers and partners. Research and commercial exploitation are closely linked in Health & Bioresources, so that the Center's excellent scientific output has proven to be a strategic guarantee for innovative and impact-oriented solutions. In 2019, the Center's methodological and scientific excellence manifests itself, among other things, in eleven issued patents and eight patents filed, in more than 70 publications in peer-reviewed journals, and over 43 peer-reviewed conference publications. Furthermore, the number of invited lectures and keynote speeches remains at over 84 lectures. As a result, the Center is on track to reach its strategic goals by 2021. Building on a competitive technology portfolio with a focus on the respective core topics and customer groups of the individual Competence Units, the Center has a solid knowledge base, competitive know-how at the highest level, as well as a strong patent portfolio. In addition, the Center is striving to establish new technology partnerships in the current strategy period, to actively participate in European public-private partnerships in both Health and Bioresources, and to establish further spin-offs from Bioresources and Molecular Diagnostics.

### Portfolio development highlights 2019

#### “Little helpers, big benefits”

Microbiomes are complex communities of microorganisms that play an important role both for human health and for the stress tolerance and nutrient intake of plants. The Competence Unit Bioresources investigates the functions and mechanisms of plant-associated microorganisms. The focus here is on the application potential as a bio-fertiliser or for combating biological diseases. As part of EU projects, new applications are being developed together with companies, e.g. the use of bacterial strains to mobilise nutrients bound in the soil and to reduce inorganic fertilisers (BBI Susfert). In further EU-funded projects (H2020 SolACE, H2020 MASTER), microbiome data are analysed to understand the role of microorganisms in drought stress tolerance and derive applications therefrom. The development of alternatives to chemical pesticides is also an important area of application. Microbial applications for the treatment of major wheat and maize diseases are being developed (H2020 MASTER) as well as new ways to control the pathogen *Xylella fastidiosa* in olive trees (BBI BIOVEXO) and innovative application technologies for the use of microorganisms, such as the SeedJection™ process, by introducing microorganisms directly into the seed. In addition, the Competence Unit heads the Coordination & Support Action MicrobiomeSupport to support and coordinate microbiome research and resulting innovation in the field of system foods, i.e. from primary production to human health, especially in connection with European research policy decisions. This also happens as part of the international Bio-economy Forum.

#### “The lab in the bag”

In the Competence Unit Molecular Diagnostics, the entire diagnostic process from sampling to evaluation of the results and findings is intensively researched and worked on in numerous development projects (H2020 ELSAH, H2020 FAPIC, IMI BIOMAP, IMI ImmUniverse). To this end, primarily the bodily fluids blood and saliva are examined, but other media such as tissue, milk or excreta are also used in special projects. This resulting expertise is continuously developed through innovative ideas in order to be able to offer our academic and industrial partners application-oriented solutions to questions in human and veterinary diagnostics. The focus in doing so is on utilizing the know-how generated, in particular, on establishing so-called point-of-care (POC) rapid tests for customer-specific diagnostics. These POCs allow timely, precise and cost-effective diagnosis on-site. To give an example, the know-how of the Competence Unit is currently being further developed together with an internationally operating company in the animal health sector towards cutting edge infection diagnostics. The aim of these

contract research projects (e.g. BI-UMAP, BI-ENTERIC) is to establish diagnostic POC systems in the livestock sector which can detect pathogens in milk and faeces at an early stage and in a specific manner using pathogen-specific biomarkers. Affected animals can thus be treated in a more targeted and gentler manner in terms of animal welfare and food safety. In this innovative diagnostics, the three essential sub-areas of sample preparation, testing and diagnostics are to be combined in a complete system. After completion of the development projects, the prompt market introduction of these veterinary diagnostics by our industrial partner is planned. Work continues to be carried out at full speed on POC systems for saliva and blood diagnostics, so that in the near future medical professionals will be able to make therapy decisions based on precise findings for important human diseases directly when visiting a doctor's practice (e.g. New Point-of-Care Technology Systems for Saliva, Minimally Invasive Biomarker Discovery and Validation). Another focus of contract research is the investigation of epigenetic biomarkers of colorectal cancer patients.

# REPORTS FROM THE CENTERS

## DIGITAL SAFETY & SECURITY

For the Center for Digital Safety & Security, the year 2019 was marked by the further expansion of an international technological and thematic leadership in key areas of modern digital technologies in the European ECO system of applied research. In several areas, AIT was able to make a significant contribution to the implementation of a European strategy. The successful positioning in the following areas is particularly noteworthy here:

1. Quantum communication and Quantum Key Distribution (QKD)
2. Technologies for digital identities and border management
3. Blockchain-based forensic tools against organized crime
4. Crisis and disaster management (CDM) and finally
5. Cyber Security

In addition to economic success, the record of scientific success and the expansion of the networks with universities and scientific institutions give proof of the Center's high scientific competence level. In addition to a repeated achievement of the high number of scientific publications, 2019 saw a significant increase in the Center's patent submissions.

These collective efforts of the Center have played a major role in the successful establishment of core technology areas of global digitisation in the Austrian business and science location, thus making a significant contribution to know-how, training of young people, and available technologies for the establishment of new businesses as well as for the increase of the competitiveness of Austrian companies.

### Highlights of the 2019 portfolio development

**Quantum Communication (QKD):** In order to achieve a strategic autonomy in this sensitive area, the European Commission is building up its new Quantum Communication Infrastructure (QCI) initiative based on the competencies, projects and technologies of AIT. AIT is positioned as a key player in the most important EU initiatives and projects: Chair and participation in two EU flagship projects for quantum technology development, chair of the EU-wide demonstration project for quantum communication, and AIT acts as national representative in the EU QCI coordination group.

**Digital identity and border management:** In the context of public security, innovative tools for mobile personal identification as well as for an effective digital border management system are being developed. France is relying on AIT expertise in its strategic planning for the construction of a modern digitised border in the Brexit context. In 2019, a prototype of a modern digital border management system was implemented in the port of Calais chaired by AIT as system integrator. AIT chairs the major Foldout initiative for the development of new technologies for the border management between checkpoints, and AIT has started licensing AIT fingerprint biometrics together with several companies.

**Virtual currencies and Blockchain technologies:** In the areas of fighting organized crime and virtual currencies, comprehensive know-how has been built up and a technology platform has been developed that plays a leading role in the international arena, as is impressively demonstrated by collaborations and appearances at the Interpol World Conference. AIT has developed a forensic technology platform and

leads national and one key European initiative on the topic of forensics in virtual currencies such as TITANIUM (Tools for the Investigation of Transactions in Underground Markets).

In the area of crisis and disaster management (CDM), one of the largest EU exercises was held in Austria, in the course of which AIT was able to present its solution portfolio in this area to an international audience. First implementations, based on the AIT technology, have already been carried out by the first provinces in order to modernise their CDM systems in a highly cost-effective manner. AIT has already received several innovation awards – eAward Austria, EU Driver+ Award – and the province of Styria is the first province in Austria to operate the AIT solution as a part of the provincial warning centre.

In the area of Cyber Security, the international footprint was significantly strengthened and AIT know-how was successfully positioned in several countries from Europe via Africa to the US. AIT trainings have been conducted e.g. in Eastern European countries, in Kazakhstan, Korea, and Oman. This international success is complemented by the successful organization of a worldwide Cyber Security Challenge in cooperation with the UN Organization as part of the UNCCT Global Counter-Terrorism Programme on Cybersecurity and new Technologies in Vienna as well as through the successful positioning of Vienna as an international dialogue forum "technology meets diplomacy" for a global discourse – Vienna Cyber Security Conference.



# REPORTS FROM THE CENTERS

## VISION, AUTOMATION & CONTROL

The Center for Vision, Automation & Control covers the entire chain from capturing information through (vision) sensor systems via sensor fusion, the combination of physically based models with machine learning and data analysis concepts, the use of this information in error detection and isolation, optimization and control, all the way to cognitive decisions for industrial processes, systems and components.

In the three research fields of High-Performance Vision, 3D Vision and Modeling, and Complex Dynamical Systems, the scientific foundations are researched and implemented as prototypes for this purpose. The latter topic is being developed in cooperation with the Automation and Control Institute (ACIN) of TU Wien [Vienna University of Technology]. The participation in the PROFACTOR GmbH expands the portfolio of the Center, especially in the field of assistance robotics.

Through the consistent strategic orientation of research to the needs of the industry-oriented market, the Center's research results rapidly find their way into our clients' products, services and production processes.

### Portfolio development highlights 2019

In the High Performance Vision research field, the Center has been holding a leading global position when it comes to the print inspection of security documents (in particular of banknotes) for many years. On behalf of international central banks, the Center has been instrumental in designing a standard for an open interface between high-performance banknote sorting machines and quality or authenticity sensors. On behalf of international industrial customers, this new standard is being implemented by experts at the Center in sorting machines of the latest generation.

Research in the fields of measurement technology and quality control is constantly being extended to new industrial domains. The latest sensor and camera technology and the knowledge in processing extremely high data rates allow research questions to be dealt with both in the high-speed range as well as in tasks with extremely high image resolution. The range extends from a road scanner, which in the future will provide the 3D structure of the road surface at a resolution of 60 µm at 130 km/h, through to the inspection of particularly fine structures, in the single-digit micrometer range, in the field of electronics and chip production. Extremely high data rates are processed using intelligent algorithms – usually in real time. Computational Imaging and AI technologies are used to inspect hardly specifiable surface properties and to determine defect sizes that are difficult to quantify. The examination of certain shiny, metallic, reflective or black surfaces with the aid of camera systems becomes only possible through this.

Assistive and autonomous systems are also becoming more and more important for trucks and tractors, mobile work machines, off-road vehicles, in the field of aviation, in trains and trams, as well as for robotic applications and machines in production systems. For this environment, the Center is developing methods and technologies in the research field of 3D Vision and Modeling regarding 3D sensor technology, environment detection, mapping, localization, navigation and machine learning. Together with industrial partners, prototype systems are implemented. The latest research results help to equip the tramway driving assistants developed at the Center with new functionalities in the course of a long-standing cooperation. The experiences in the operation with currently more than 100 trams yield new conclusions and requirements as to how the safety of tram operations can be increased. The award of the State Prize for Mobility 2020 of the BMK (formerly bmvit) is a recognition of the Center's years of research work in this field.

As a complement to rail vehicles, the logistics sector is of great interest as well. The AIT's participation in the Digi-Trans GmbH, a test centre for automated and multimodal freight mobility, enables the company to drive forward projects with national and international logistics companies. In a similar environment, in the partial automation of port cranes, the technology is being further developed together with a customer for the international market. In general, (semi-)autonomous work machines prove to be a field of application in demand by the market in which many open and challenging research questions still need to be resolved. The participation in AIRlabs Austria GmbH, an innovation laboratory for the development and operation of a unique drone test infrastructure in Austria, will enable us to continue our research work in the field of airborne systems with a large number of clients and partners in a practice-oriented manner in a real environment in the future.

The development of the research field Complex Dynamical Systems was continued as planned. The main competencies of this research field are physical modelling, path planning, control, sensor fusion, real time optimization and the analysis and design of complex dynamic systems; these have been successfully used on an industrial scale in a large number of client projects. The close cooperation with the Automation and Control Institute (ACIN) of TU Wien [Vienna University of Technology] provides an excellent bridge to basic research in these fields.

In process automation, the excellent market position in the modelling and control of heat treatment processes in the metal industry could be further expanded. The non-linear model predictive control of strip annealing furnaces already in use has been extended by non-linear estimation methods for the unknown strip emissivity to further increase temperature accuracy and homogeneity. Models for describing the behaviour of cooling zones were added to the portfolio in order to be able to mathematically map the entire heat treatment process in the medium term and to be able to adjust the material properties of the heat-treated products in the process based on this.

Through the combination of scientific expertise in the field of image processing and machine learning in the Center, the activities in the area of cross-centre research projects for the development of (semi-)autonomous (mechatronic) systems have been continued. Together with an industrial partner, we have succeeded in equipping a sewing machine with additional actuators, integrated sensor technology (image processing) and control in such a way that different (curved) leather cuts can be sewn together fully automatically.

# REPORTS FROM THE CENTERS

## MOBILITY SYSTEMS

Mobility has a high priority in our society. On the one hand, it is an important success factor for the economy; on the other hand, mobility is also closely linked to the personal quality of life of all citizens in a private context. The advancing digitisation enables promising new solutions for the transport of people and goods, but also for the operators of the transport infrastructure. Some examples include automated driving with the aim of reducing the number of accident victims, multimodal transport platforms, sharing models, new logistics systems or continuous condition monitoring of the transport infrastructure and predictive maintenance concepts based on these. The Center for Mobility Systems researches holistic solutions for an environmentally friendly, efficient, safe, socially inclusive and reliable mobility system.

### Portfolio development highlights 2019

In the field of logistics, the Center is concerned, among other things, with the optimisation of yard management through automation. In March 2019, the Center implemented a pilot project in the field of autonomous yard logistics on behalf of the Austrian postal services. A specially developed transfer vehicle at the Post Office's largest logistics location in Inzersdorf ensured the independent transport of containers – also known as swap bodies (WAB) – on the company premises. Each day, Austrian postal service turns over about 3,300 WABs at its locations. A standard swap body lifting truck was converted for automated operation for this project. In the future, the vehicle is to run on electric power, thus making everyday logistics not only more economical but also more sustainable. A further research focus of the Center for Mobility Systems in 2019 was the development of innovative methods for the condition assessment and monitoring of traffic infrastructures. In cooperation with Wiener Linien, the Center is working on a procedure for the semi-automated condition assessment of tram rails and switches. To date, the condition of the rails is being assessed in the course of periodic inspections by trained personnel. In order to make

these inspections more efficient in the future, employees are to be supported by automatically generated measurement results. For this purpose, sensors applied to a measuring vehicle record the vibro-acoustic emissions of the wheel-rail contact. Based on this data, machine learning algorithms are used to draw conclusions about the rail condition throughout the network. In the future, the instrumentation of control vehicles is also to be made possible.

In the area of structural monitoring, the Center is currently researching a method for the continuous observation and evaluation of deformations of structures together with its partner ZAMG. With the help of modern radar satellite data and freely available data from the ESA Sentinel programme, it will be possible in the future to record deformations of buildings and slopes from outer space. This data is supplemented by laser measurements and mobile mapping methods from the RoadSTAR measurement vehicle, with the aim of generating accuracy in the millimetre range. Based on this, models for a reliable, objective and continuous condition assessment of bridges, for example, will be developed that will enable the operator to obtain a network-wide overview and foresighted planning of maintenance measures. Another project led by AIT is concerned with a new method for automated crack detection on non-reinforced inner tunnel linings. To this end, a measuring system based on Distributed Fibre Optic Sensing was further developed: strain measurements can be carried out with a very high degree of accuracy using glass fibres that are subsequently attached to the structure. The method enables crack width measurements to be made with an accuracy of 0.1mm for fibre lengths of up to 70m. This makes it possible to identify local damage in the structure (e.g. cracks) or unexpected changes in the strain pattern. This method is currently being tested in a motorway road tunnel, and a patent was filed in August 2019.

# REPORTS FROM THE CENTERS

## LOW-EMISSION TRANSPORT

The Center for Low-Emission Transport (LET) researches and develops sustainable, low-emission vehicle components and their production methods. In order to best serve the key technologies of drivetrain electrification and weight reduction through material-based lightweight construction, the research work is divided into five research fields and four Business Cases.

In the research field of Battery Technologies with the corresponding business case of the same name, the batteries of the next generation are researched. Solutions for efficient powertrain electrification are being developed in the research field of Propulsion Technologies with the corresponding business case of the same name. The research field of Casting Processes for High Performance Materials with the business case Casting Technologies deals with the properties of new light metals and their production processes. Developments in the processing and forming behaviour of these light metals are made in the research field of Advanced Forming Processes and Components with the business case "Forming Technologies". In addition, simulations are carried out in the research field Numerical Simulations of Processes and Components, which supports the business cases Casting Technologies and Forming Technologies, in order to develop energy- and resource-efficient casting/forming processes as well as to further optimize the material properties of the components. The emerging topic of Additive Manufacturing from light metals is also part of this research field.

The LET Center cooperates intensively and closely with national and international partners from science and industry as well as stakeholders and was able to achieve significant research results to increase its visibility last year. For example, the battery laboratory and the new Research Pilot Line were opened in July 2019 with a symposium with the participation of international battery experts. Thanks to this new infrastructure and the know-how built up with it in the research areas Battery Technologies and Propulsion

Technologies, seven EU projects (H2020 and CleanSky) were won in addition to some national projects, thus expanding networking and reputation in the community. The LKR celebrated its 25<sup>th</sup> anniversary with an in-house exhibition and lectures in September and was thus able to present its portfolio to representatives of industry and science – including, among others, the additive manufacturing from light metals, which got its own Additive Manufacturing Laboratory at LKR in 2019. Thanks to the progress made, the LKR was not only able to produce the winner's trophies for the Upper Austrian Photo Challenge in 3D printing, but also to act as coordinator for a major EU project with 20 partners on this topic. Two highlights from last year are presented in more detail in the following paragraphs.

### Portfolio development highlights 2019

#### Alternative concepts for the efficient air-conditioning of the cabin of battery-powered electric vehicles

The heating and cooling requirements of conventional heating, ventilation and air conditioning modules (HVAC) drastically reduce the actual range of battery-electric vehicles (BEV) under certain environmental conditions. Therefore, there is strong interest in reducing the energy consumption of HVAC systems in electric vehicles. The current research focus was on the search for alternative air conditioning concepts for the driver's cabin of an electric truck. Various approaches and measures, such as thermal insulation, preconditioning and radiant heating, were taken into account, and thus intelligent and optimized air conditioning strategies were implemented on the test bench, which enabled an additional reduction in the energy required. Flow and temperature conditions in the driver's cabin were simulated and analyzed within a simulation environment using simulation libraries developed at AIT. 3D-CFD models were also used to carefully examine the effects of potential measures before implementing them. The most promising air conditioning concept was identified using the simulation models that had

# REPORTS FROM THE CENTERS TECHNOLOGY EXPERIENCE

been set up and selected together with a representative of the industry for further consideration and development. This AIT concept consists of improved thermal insulation for the driver's cabin, a heat recovery system, radiant heating and preconditioning. The selected measures were then integrated into the driver's cabin and validated in a climate cell at AIT under different predefined environmental conditions (temperature, air humidity and solar radiation). The results of the measurements, including preconditioning, show a reduction in the heating energy required in the reference cycle by up to 50%. The AIT concept thus proves a significant increase in efficiency in comparison to the original concept and thus allows a range increase of 6%.

## Coupling of the process simulation along the production route

Components for structural lightweight construction in both low-emission/zero-emission mobility as well as in aerospace today have to meet ever increasing requirements, with the required mechanical properties depending strongly on the achievable microstructure of the material. From liquid light metal to the finished component, it is a complex process in which the structure and material properties are influenced in many steps (casting, forming, heat treatment, ...). In order to achieve the best possible results at every process step, it is necessary to know the history of the process and structural parameters. In this way, each subsequent process step is based on the real rather than the ideal

microstructure, and the best process parameters can be selected. The main objective of the current research focus at the LKR Leichtmetallkompetenzzentrum Ranshofen is the virtual representation of individual processes by means of numerical simulation along the manufacturing chain, in order to gain insight especially where processes are "hot", "pressurized" or "closed". This holistic approach evaluates differences in the mechanical performance of the components as well as additional potential for weight savings. So far, the model structure of the individual processes and the coupling of the original forming and shaping processes have been carried out. A special coupling of the fluid simulation with the thermomechanical simulation of the components using the numerical tool preCICE achieved a reduction of the computing time by up to 80% – and thus the applicability on an industrial scale. The temperature development was used in this coupled simulation to simulate and predict the grain growth in the semi-finished product and to subsequently transfer the data to process models of extrusion and forging for microstructure modelling approaches. In parallel to the numerical work, the processes were recorded experimentally using sensors. This experimental procedure served to generate data sets with which the numerical simulations were then finally compared and validated. In 2019, in addition to the scientific exploitation of the results (two journal articles, an ongoing dissertation, a completed master's thesis), a large H2020 project and contract research projects from industry could be acquired from this research project.

In 2019, the focus was set in the direction of Digital Experience or Experience Business Transformation, respectively, and established as an essential component in the Center. This is associated with a consolidation of the value chain and essential foundations for a focusing or realignment of Center topics.

In the research field Experience Measurement, questions about AR, VR & Work Experience Assessment were explored. In connection with this, contextualized laboratory studies on assistance for assembly work using AR (Augmented Reality) enabled an evaluation of the usefulness and usability of various questionnaire instruments and their further development for the measurability of assistance and work experience. As far as the evaluation of VR training experiences in high-risk and stressful situations is concerned, the SHOTPROS project will carry out scientific evaluations of VR stressors to determine whether they initiate corresponding stress reactions in the test subjects.

In the research field of Diversity Experience, significant progress has been made in the investigation of social diversity dimensions, the observation of which is a prerequisite for an in-depth understanding of user needs. This was also accompanied by the further development of diversity-sensitive research methods (e.g. finalisation of the EvAALua-tion2 measurement instruments for the FFG). In the area of Human Factors in Cybersecurity, a questionnaire instrument was developed to record cybersecurity behaviour in companies.

In the research field Field Capturing Experience, methods for achieving increased acceptance of complex ambient and mobile technologies were investigated and demonstrated. Together with partners, activities in the Aspern Seestadt and the Viertel Zwei were continued, building on the previous results of the Living Lab. Here, questions relating to Smart Buildings, such as integrated management, unification and analysis of the numerous different data streams, are examined.

In the research field Future Interfaces, progress was made on future interaction approaches in the areas of Augmented Human and Playful and Persuasive Interaction. The development of a framework to enable interaction with real objects and real multi-touch devices, such as smartphones, tablets and terminals, in VR deserves special mention. This was successfully evaluated in the PCCL and FX Future Experience projects and will also be used in the DIRIGENT project.

In the field of scientific publications, papers could be positioned at major conferences. These include the QOMEX 2019 conference with four papers on video quality optimization for low-vision users, quality of 360° video streaming, impact of network protocols, and AR assistance experience in the context of Industry 4.0. The Center was also very visible in the organization of the QOMEX 2019 conference, both as organiser and in designing the programme. The results of a comprehensive analysis on the consideration of diversity dimensions in human-computer interaction research, research gaps and opportunities for diversity-sensitive HCI research were presented as a full paper at the CHI (Conference on Human Factors in Computing Systems) 2019. The CHI conference is the most competitive and highest-level conference in the field of human-computer interaction. At the leading conference on HCI in the area of Play, CHIPlay 2019, a total of three papers were presented, including a full paper on "an analysis of user-centered movements using semantic trajectories." Furthermore, a Best Paper Award was achieved at the Aml Ambient Intelligence 2019 conference with an empirical analysis of user-driven requirements for Smart Homes. Another highlight is the publication "Be active! Participatory Design of Accessible Movement-Based Games", which will be presented in February 2020 at the 14<sup>th</sup> International Conference on Tangible, Embedded, and Embodied Interaction.

# REPORTS FROM THE CENTERS INNOVATION SYSTEMS & POLICY

## Portfolio development highlights 2019

The research field Capturing Experience developed approaches for a simpler and more trustworthy handling of automated systems in order to take the human aspects in using them more into account. In the Sim4Blocks project, for example, prototypes for various automation levels of flexible thermal control were developed and examined together with residents of test households. The insights gained are being incorporated into further international collaborations. Furthermore, confidence calibration methods for automated systems were developed. In the auto.Bus – Seestadt project, a so-called Reliability Display for automated vehicles was installed and demonstrated, which gives passengers an insight into the recognition accuracy and the next actions planned. The knowledge gained here is also used in the systematic development of Reliability Displays in other application contexts. Thus, with the approval of the CALIBRaITE IdeaLab 4.0 project, the systematic development of reliability displays for predictive maintenance is now being driven forward for the first time in automobile production. The topic of acceptance of automated processes of demand-side management is dealt with as well.

As part of the project series QoEStream, a high-performance data acquisition and analysis platform is being developed together with partners which allows real-time collection, evaluation and representation of experience-relevant data of media streaming services with more than 1 million users in real time. The system allows early detection and diagnosis of experience-related user problems (such as problems connecting to the server and resulting in no or a delayed start of the media stream, repeated and long pauses of the media stream due to poor network connection) and exploits the advantages (flexibility, scalability, robustness) of modern virtualization and Big Data technologies. The system is used for monitoring video streaming on the iOS, Android and web browser platforms and is maintained and hosted by AIT. It captures all Quality of Experience (QoE) relevant error and quality indicators (start times, interruptions, bit rate changes, etc.), from the provision through to the playback of a clip. Coordinated KPIs and dashboards visualise which parts contribute positively or negatively to the streaming experience. In addition, Smart Alerts provide round-the-clock notification of experience-relevant deviations and events.

In the year 2019, the Center for Innovation Systems and Policy has performed very well both economically and scientifically and has been able to make a name for itself on a national and European level. The successes in acquiring funded projects, contract projects and framework agreements are manifested in an exceptionally high order level at the end of 2019. This also resulted in a corresponding increase in external revenues in comparison to the previous year.

At European level, the visibility of the Centre has been increased, in particular in the areas of foresight and mission-oriented research, technology and innovation (RTI) policies, the provision of micro-data and robust indicators on knowledge production and exploitation in research and innovation systems, as well as new forms and practices of responsible innovation in the public and private sectors. At the national level, new customer segments were developed, particularly in the areas of public agencies, cities and associations. In a number of projects, the potential for cooperation with the other AIT Centers could also be utilized to offer comprehensive system solutions.

## Portfolio development highlights 2019

Transformative RTI policy forms the core of the Center's research programme. This orientation has proven to be very seminal in supporting new policy initiatives, which are summarised under the term mission-oriented RTI policy. In 2019, it was possible to support the bmvit (now BMK) as well as the OECD and the EU Commission in the further establishment of this policy approach. Particularly noteworthy at this point is the framework contract Foresight on Demand, under which the five Mission Boards set up by the EU Commission are currently being monitored. The same goes for the continuation of work to support strategic partnerships at European level, in particular the European Institute of Technology (EIT) Climate and the Joint Programming Initiative (JPI) Urban Europe. In the course of this, demand-side policy instruments are increasingly becoming the focus of attention in order to bring innovations to a broader application. In this context, the Center was able to advance its work on experimental policy approaches last year, such as experimental spaces for new forms of regulation and public sector acquisition. Scientifically, this work is reflected in the award of the contract to organize the International Sustainability Transitions Conference 2020, which is being prepared jointly with the WU Vienna University of Economics and Business.

Research and innovation will only be effective in terms of decarbonisation if we succeed in scaling up and replicating pilot and demonstration projects. This transition from individual pilots to a broader implementation has been the subject of several of the Center's projects at the national and European levels, partly in cooperation with other AIT Centers. Cases in point comprise models for accelerating the transition of regional energy systems (e.g. smart grid, smart city) and national food systems from production through to utilisation (e.g. circular economy) that have been implemented towards more sustainability.

Digital platforms for mapping and visualizing organizational data open up new possibilities for supporting the development of innovative communities of companies, public institutions and researchers in their networking and knowledge exchange. Last year, the Center was able to support several ministries and agencies in the mobilization of such communities with the aim of increasing collective innovation capacity. In doing so, survey methods were combined with the development of digital infrastructures in order to guarantee high interaction and data quality.

With the continuation of the European Research Infrastructure for Science and Innovation Policy Studies (RISIS) infrastructure as an advanced community, the Center's profile in the field of R&I data and indicators was methodologically advanced. In addition to structured microdata at the organizational level, RISIS also uses unstructured data, and new semantic methods are employed for indicator development. These new methods and procedures developed in RISIS will also be applied from 2020 onwards in a somewhat similar project on R&I data and indicators specifically in the energy sector. Flanking the expansion of RISIS, the Head of Center was appointed as a visiting professor at the Université Gustave Eiffel, the coordinating organization of RISIS, in order to further expand scientific cooperation over the next few years.

## SEIBERSDORF LABOR GMBH

Seibersdorf Labor GmbH (SL) offers highly sensitive lab and analytical services as well as special developments for complex measurement technology in the segments of chemical analysis, radioactivity and ionizing radiation, EMC and high frequency technology as well as optical radiation. The product portfolio is supplemented by education and training offerings of the Seibersdorf Academy.

In 2019, some of the profits generated were again reinvested in our own research and development as well as in the continuous improvement of quality with regard to certifications and accreditations. The focus of applied research and experimental development was on the following areas:

- Detection of doping substances and disease markers
- Development and validation of methods for stability studies
- Method and prototype development for the measurement of electromagnetic fields

- Safety of laser and optical radiation
- Measurement methods and simulations for radiation hardness
- Development of methods for ultra low-level measurement technology
- Development of radiation protection measuring devices and probes
- Development and quality control of (radioactive) medicinal products

The order level of Seibersdorf Labor GmbH has risen continuously in most subject areas in recent years, and has increased strongly in individual business areas. From the current perspective, we expect a stabilisation at this high level or continued slight growth.

## NUCLEAR ENGINEERING SEIBERSDORF GMBH

The Nuclear Engineering Seibersdorf GmbH (NES), a 100% subsidiary of AIT GmbH, has two main tasks: the management of radioactive waste produced in Austria (collection, sorting, processing, conditioning and interim storage) and the decontamination and decommissioning (dismantling) of nuclear facilities, in particular from 45 years of research and development at the Seibersdorf site.

Both tasks are carried out on behalf of the Republic of Austria (currently represented by the BMK) and there are long-term contracts with terms until 2033 (decommissioning) and 2045 (waste management), which also regulate the financing of the activities.

The main projects of NES in 2019 in the field of waste management were the start of the reconditioning of old waste packages in the "New Handling Centre" – a building complex for the processing of non-combustible radioactive waste – and, in the field of decommissioning, the start of active operation of the soil measurement system which can be used to measure and sort slightly contaminated materials from previous decommissioning projects in order to minimise the volume of radioactive waste as far as possible.

# BUSINESS PERFORMANCE 2019

## EARNINGS POSITION

For the AIT Group, the 2019 financial year was again characterised by an increase in sales and revenue. Revenue increases both in the area of contract research and co-financed research, personnel growth and a positive earnings development characterized the year under review.

Contract research grew by 2.0 million EUR (+3.7%) in the year under review compared with the previous year; the growth tangent of the co-financed revenues showed an increase of 1.4 million EUR (+4%).

The contributions of the shareholders, the third major source of funding for the research work of the AIT Group, in 2018 had still included a sum of 1.9 million EUR for the federal initiative to create a research centre for electronically based systems (Silicon Austria). The shares in the Si. A. Errichtungs-GmbH founded for this purpose were sold at the end of 2018. Adjusted for the sum of the federal funds used for Si. A. Errichtungs-GmbH, 2019 shows a slight increase in the use of federal funds in the AIT Group. Compared with the previous year, this results in an increase of 1.3 million EUR (+2.6%).

Other operating income / other revenues of 13.9 million EUR include the income from the reversal of provisions in the amount of approx. 1.5 million EUR, revenue from the reversal of value adjustments of 0.4 million EUR, the reversal of investment grants in the amount of 8.9 million EUR, proceeds from recharged rents and operating costs of 1.1 million EUR as well as other operating income / other revenues in the amount of approx. 2 million EUR.

In contrast to the presentation of the P&L structure of the annual financial statement, the presentation for the management report was maintained unchanged in order to present the proceeds from research contracts without confusion with the proceeds from expenses charged in the amount of 5.4 million EUR (previous year: 3 million EUR) and the other revenues in the amount of 1.7 million EUR (previous year: 2 million EUR).

In the presentation for the management report, an additional 4 million EUR (previous year: EUR 3.5 million) was reclassified to the line Nuclear BMK – formerly bmvit – as well as EUR 4.9 million (previous year: 3 million EUR) being reclassified to the line Nuclear BMK – previously BMNT – in order to achieve a better presentation of the overall “nuclear financing”.

Designation in kEUR	ACTUAL 2019	ACTUAL 2018
Revenues R&D	53,260	52,069
Inventory changes	825	67
<b>Revenues R&amp;D including inventory changes</b>	<b>54,085</b>	<b>52,136</b>
Funding R&D	34,832	33,013
Inventory changes	1,495	1,923
<b>Revenues R&amp;D including inventory changes</b>	<b>36,327</b>	<b>34,937</b>
<b>Total Revenues from Research Contracts</b>	<b>90,411</b>	<b>87,073</b>
Services BMK – previously bmvit	49,779	50,373
<b>Total Payments of the Shareholders (Research)</b>	<b>49,779</b>	<b>50,373</b>
Nuclear BMK – previously bmvit	3,966	3,475
Nuclear BMK – previously BMNT	4,942	3,059
<b>Total Financing Nuclear</b>	<b>8,907</b>	<b>6,533</b>
<b>Other operating income / Other revenue</b>	<b>13,877</b>	<b>14,774</b>
<b>TOTAL OPERATING INCOME</b>	<b>162,975</b>	<b>158,753</b>

# EXPENSE STRUCTURE AND RESULT

The company's expense structure for the reporting year 2019 shows slight increases of 0.4 million EUR compared to the previous year for project-related material costs and related services (reporting year: 18.3 million EUR, previous year: 17.9 million EUR).

As a result of higher staff numbers as well as of the collective agreement related salary indexing, personnel expenses rose by approx. 3.6 million EUR (reporting year: 96.8 million EUR, previous year: 93.2 million EUR).

Compared with the previous year, other operating expenses showed a nearly constant development.

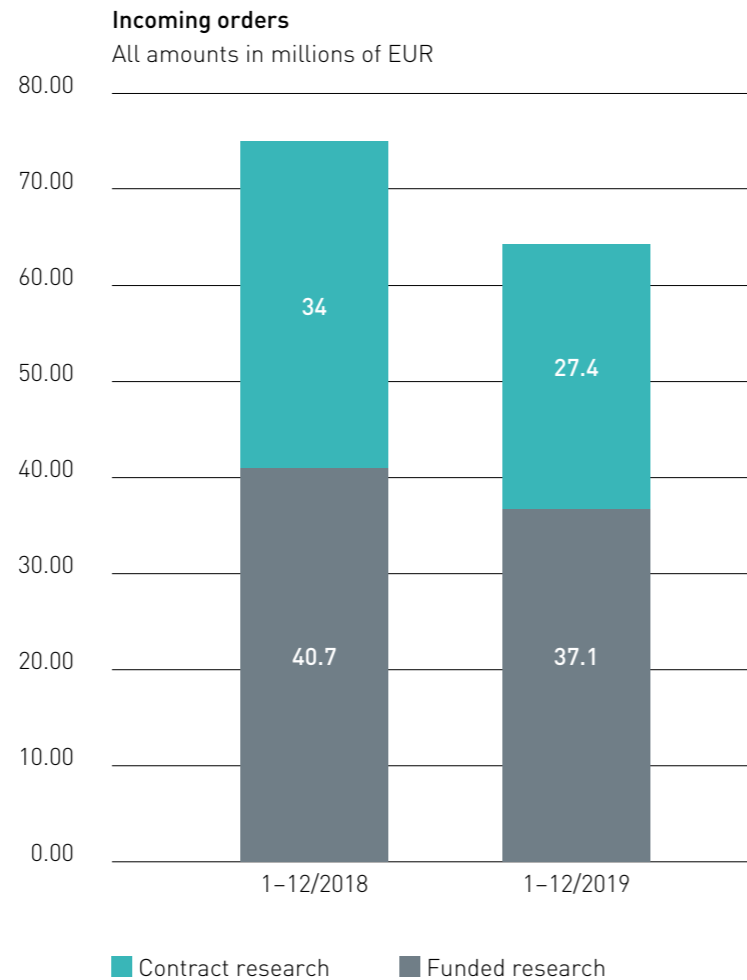
The annual result is 4 million EUR and shows a stable development of the AIT Group.

Designation in kEUR	ACTUAL 2019	ACTUAL 2018
<b>TOTAL OPERATING INCOME</b>	<b>162,975</b>	<b>158,753</b>
Material costs	- 8,294	- 7,666
Services rendered by third parties	- 10,043	- 10,225
<b>Material costs and purchased services</b>	<b>- 18,337</b>	<b>- 17,890</b>
<b>Personnel expenses</b>	<b>- 96,840</b>	<b>- 93,206</b>
<b>Amortizations</b>	<b>- 11,032</b>	<b>- 11,451</b>
<b>Other operating expenses</b>	<b>- 32,749</b>	<b>- 32,498</b>
<b>TOTAL OPERATING EXPENSES</b>	<b>- 158,958</b>	<b>- 155,045</b>
<b>OPERATING PROFIT</b>	<b>4,017</b>	<b>3,709</b>
<b>Financial profit</b>	<b>313</b>	<b>- 86</b>
<b>Result before taxes</b>	<b>4,331</b>	<b>3,623</b>
<b>Taxes on income and earnings</b>	<b>- 281</b>	<b>- 393</b>
<b>ANNUAL RESULT/PERIOD RESULT</b>	<b>4,050</b>	<b>3,229</b>
<b>Result carried forward</b>	<b>26,863</b>	<b>23,633</b>
<b>NET PROFIT/LOSS</b>	<b>30,912</b>	<b>26,862</b>

# INCOMING ORDERS

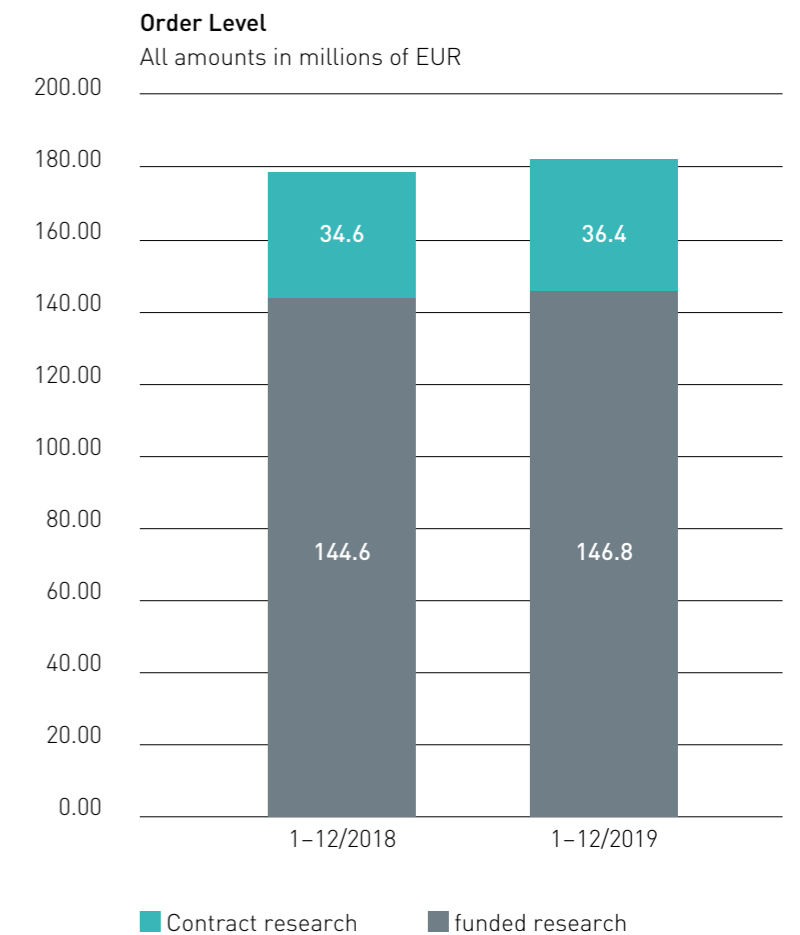
In the year under review, orders worth 64.5 million EUR (previous year: 74.7 million EUR) were acquired. The incoming orders of the AIT Group were therefore unable to match the level of the very strong acquisition year 2018. In the area of contract research, incoming orders in the year under review amounted to EUR 27.4 million (previous year: 34 million EUR). In the previous year, contract research orders in the area of fast image processing alone amounted to around EUR 7.5 million, which will be handled in the year under review and in subsequent years. This nearly unparalleled top level of the previous year could not be reached again in the year under review. In the area of co-financed research,

incoming orders in the year under review amounted to EUR 37.1 million (previous year: 40.7 million EUR). The acquisition of funded projects follows the cycles of calls from the grant authorities and the associated decision and award windows. The award of a number of open grant applications is expected at the beginning of the following year. Despite the lower volume than in the previous year, incoming orders in the year under review again contributed to the increase in order backlog and work in progress (see further below). More orders were acquired than had to be handled in the year under review. This provides a stable basis for the capacity utilisation situation in the following years.



# ORDER LEVEL

The order level in the year under review was again up in comparison with the previous year (FY: 183.2 million EUR, previous year: 179.2 million EUR, +2.2%). In contract research, the order level could be increased by 5.2% to EUR 36.4 million EUR (previous year: 34.6 million EUR). In co-financed research, the order level in the year under review was EUR 146.8 million (previous year: 144.6 million EUR) and thus increased by 1,5% over the previous year.

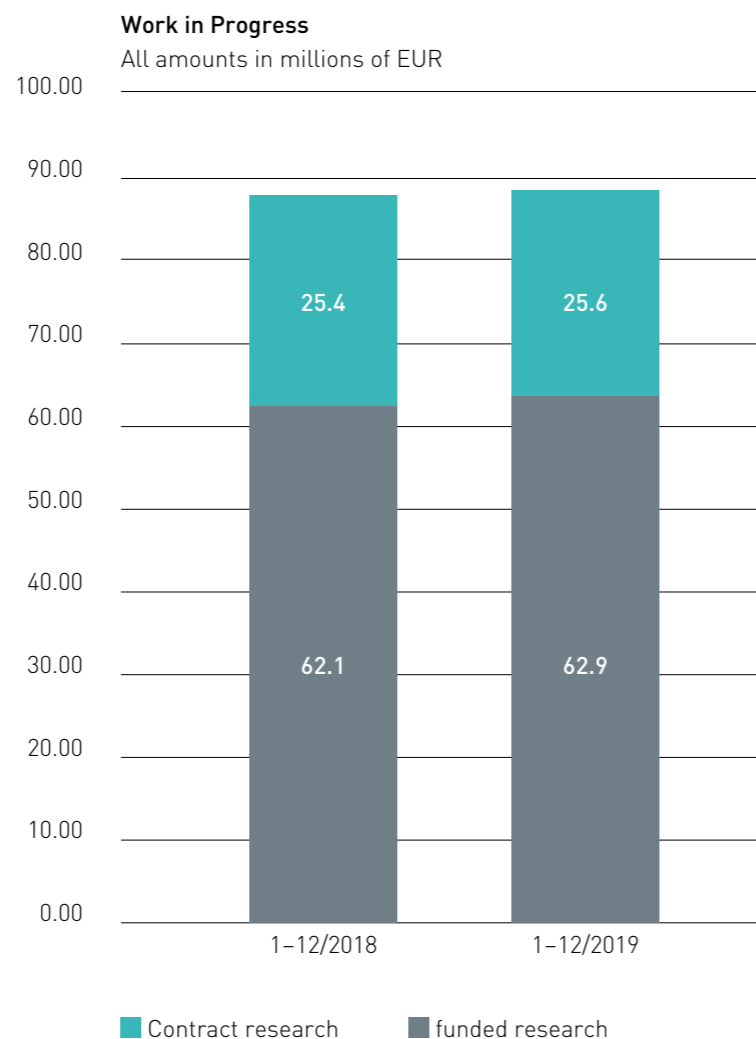


# WORK IN PROGRESS

(unfinished projects)

Work in Progress does not only take account of the invoiced revenues (as in the case of the order level), but also the deferred project revenues due to the project work progress. In the year under review, the work in progress amounted to 88.5 million EUR and was thus 1.3% higher than the previous year's figure (87.5 million EUR).

In terms of project categories, the following picture emerges: Work in progress for contract research remained stable at 25.6 million EUR (previous year: 25.4 million EUR, +0.1%), the workload of co-financed research increased by 1.3% to 62.9 million EUR (previous year: 62.1 million EUR).



# INVESTMENTS

Total investments in intangible assets and property, plants and equipment in 2019 amounted to 10.8 million EUR and are 4.6 million EUR below the corresponding previous year's figure of 15.4 million EUR.

The investment in intangible assets (primarily rights) amounted to 0.3 million EUR (previous year: 0.2 million EUR). The acquisition of assets for land and buildings amounted to 0.2 million EUR (previous year: 3.1 million EUR). The investment in technical facilities amounted to 6.8 million EUR (previous year: 6.6 million EUR). 1.7 million EUR were spent for facility and office equipment (previous year: 2.6 million EUR) and 1.8 million EUR were received for advance payments and plants under construction (previous year: 2.7 million EUR).

# LIQUIDITY AND FINANCIAL POSITION

As of 31 December 2019, cash and cash equivalents amounted to 71 million EUR (previous year: 85.2 million EUR). The liquidity level as of 31 December 2019 also includes funds for investment projects already ordered but not yet delivered.

Cash and cash equivalents are offset by liabilities from fiduciary project coordination funds in the amount of 15.2 million EUR (previous year: 26.7 million EUR).

As of 31 December 2019, there were securities deposits with a book value of 13.4 million EUR (previous year: 13.3 million EUR).

As of 31 December 2019, liabilities to credit institutions amounted to 0 million EUR (previous year: 1.2 million EUR).

As of 31 December 2019, equity amounted to 46.6 million EUR (previous year: 42.5 million EUR). After considering the investment grants in the amount of 74.4 million EUR (previous year: 74.2 million EUR), the sum of expanded capital resources for the reporting year 2019 amounts to 121 million EUR (previous year: 116.7 million EUR).



# PERSONNEL

As of 31 December 2019, the company employed a total of 1,136.3 FTEs or an average of 1,124.3 FTEs during the financial year. These figures also include apprentices, apprentices in the retention period, and HF/EU scholarship holders. Compared to the previous year reporting date (1,099.1 full-time equivalents and 1,096 average full-time equivalents), this corresponds to a total increase of the workforce of 37.2 full-time equivalents and 28.3 average full-time equivalents. The highest increases stem from the AIT Austrian Institute of Technology GmbH as well as the Seibersdorf Labor GmbH.

# REPORT ON PRINCIPAL RISKS AND UNCERTAINTIES

AIT is committed to the fact that every entrepreneurial activity involves taking risks. At the same time, a successful company knows how to use its opportunities. AIT is committed to providing resources and design options for managing opportunities and risks in order to exploit opportunities and take risks in a conscious manner.

For example, many risks have a recurring characteristic and occur whether they are recognized or not, while opportunities can often be seized only once and only within certain time frames that must be recognized as such. AIT has the freedom to seize an opportunity when it makes strategic sense. On the other hand, AIT is not free to avoid risks completely or to resolve them in every case in a contradiction-free manner.

The implemented risk management system, which was further developed and optimized in the past financial year, is used for recording and controlling.

## Risk management and internal control system

Risk management identifies and categorises significant risks inherent in the AIT activities. It defines how these risks are to be dealt with. For example, by defining which risks are consciously accepted and managed and which risks should be avoided or outsourced. The risk management system at AIT consists of three components:

1. Risk strategy
2. Risk-related responsibilities, processes and guidelines
3. Monitoring the risk management

AIT understands the Internal Control System (ICS) to encompass the totality of all the policies, process descriptions, work instructions, methods, and control measures ordered by management which serve to ensure the proper running of business operations at process level.

Internal control measures are a means to an end for AIT to achieve its objectives, and not an end in themselves. Controls are effected by employees at all levels of the organisation.

AIT regards the Internal Control System as a subsystem of risk management with strong mutual interactions. As a rule, optimizations in the ICS will have a positive effect on risk management since every improvement of the control system at process level tends to contribute to the reduction of the effort required for dealing with risks.

# RISK STRATEGY

The basis for the AIT risk management system is the risk strategy. It is established by the management and defines the risk categories and risk topics to be considered along the most important business areas or the most important value-adding resources. It evaluates these and defines how to deal with these risks (avoid risks, outsource risks, accept and manage risks).

Once the basic risk strategy has been determined on the basis of the strategic risk catalogue, the risk management system subsequently ensures that (further) risks are identified, assessed, managed and reported. The aim of risk management is to optimise the company's success and value in line with the defined AIT corporate strategy. Risk management thus takes place as a continuous process in all parts of the company.

To ensure that the basic steps of the risk management system can function properly, AIT has made appropriate specifications on processes, functions and guidelines. AIT defines its risk management as a fixed component of corporate management. Risk management is taken into consideration in the

- Development of the corporate strategy (market considerations, business case developments etc.)
- Considerations of the design of the organizational structure (e.g. by defining roles, responsibilities or even by defining organizational units themselves)
- Process development (e.g. as part of the offer, procurement or recruiting process)
- Specifications for shaping the corporate culture (such as Incentive Models, MBO etc.)



# RISK AREAS

The following is a description of the key corporate risk areas that may have a negative effect on the assets, financial and profit position of AIT.

**Financial risk, information on financial instruments according to § 243 UGB [Austrian Commercial Code] Para 3(5) UGB [Austrian Commercial Code]**

The company currently does not use any derivative financial instruments. Due to the nature of its business operations, the use of derivative financial instruments is not planned in the future either.

The value of the receivables is continuously assessed and monitored by the receivables management. A review of compliance with payment deadlines, limiting of credit limits and obtaining creditworthiness assessments from our clients limit the impact of potential payment defaults on the company's assets, financial and profit position.

**Risk of the strategic portfolio and market risk**

AIT works on the (further) development of technologies or processes whose future usability (e.g. via exploitation in contract research) must first be proven.

The resulting development risk is covered by the use of federal funds. The AIT research portfolio is thus made up of elements with varying degrees of maturity. At the same time, it represents a risk mix that makes it possible, on the one hand, to take up and finance new issues while simultaneously generating a stable income situation on the other. In exploiting the results, AIT addresses European and international markets. Both the acquisition of clients and projects in the field of contract research as well as the acquisition of third-party funding in the national and international subsidy markets take place in a competitive environment.

Against this background, a risk in terms of attainability of projected figures, the development of client groups and partner networks as well as the implementation of business models is an intrinsic part of business. The service portfolio of the AIT Group is diversified and addresses various sectors in different markets. The continuous monitoring of the order situation as well as an early recognition of trends in the relevant markets with measures that are quickly derived from these remain important tasks for AIT.

**Project funding risk**

A public project funding scheme deviating from the full reimbursement principle as well as changing interpretations of funding guidelines may lead to a deterioration of the funding rate. Changes in the terms of funding project accounting require a system adjustment of the cost accounting and project accounting system. In order to maintain a sound project assessment base, it is necessary to monitor the relevant environment and assess it with regard to possible commercial effects.

**Information technology risks**

The company has a central IT system environment, enabling the joint use of high-quality system components at the various locations. This includes, among other things, a modern security environment with a firewall, virus scanning and remote access points with multiple protection for the detection of and defence against attacks. The data is centrally stored, automatically backed up at regular intervals, and copies are kept off-premises. All our projects are based on the generally accepted standards of the Baseline Protection Manual of the Federal Office for Information Security (BSI) and ISO standard 27001 and are supplemented by empirical values reflecting the current state of technology. AIT intensively

deals with the protection of the IT infrastructure from unauthorized access or from attacks, both from within and from outside. In addition to technical and organizational measures in IT security, the company also implements targeted measures in the area of awareness training for all employees on topics pertaining to IT and information security (e.g. also when handling personal or other sensitive data).

**Legal risks**

AIT counters legal risks through constant communication between the central legal department and the local attorneys, as well as through the implemented reporting system which encompasses ongoing procedures and potential risks. Possible risks were taken into account by means of balance sheet risk provisions in the annual financial statement.

**Economic risks**

The current developments regarding Covid-19 (coronavirus) are continuously monitored and corresponding measures are taken depending on them. In particular, business events (with a larger number of people) are currently being refrained from, business trips are being reduced, travel warnings are being taken into consideration accordingly and many company areas are being converted to teleworking.

We follow the recommendations of the Austrian Federal Government both in the interests of the health of our own employees and of society. All the activities we embark on are geared to ensuring that our business operations are conducted in the best possible way in the interests of our customers and partners. Currently, the concrete effects on the course of business are still limited, although we expect projects to be postponed due to the general restrictions in public life, both in terms of order intake and order processing.

# DESCRIPTION OF KEY FEATURES OF THE INTERNAL CONTROL AND RISK MANAGEMENT SYSTEM – ACCOUNTING PROCESS

## Personnel risks

The performance of our employees is essential for the development of our knowledge-based company. The company is competing with other companies for highly qualified specialists and executives. The further development of the AIT management culture, measures for training and further education in connection with the implementation of specific technical and scientific as well as management and support role models will position AIT more strongly as a top employer internationally. Within the framework of international and domestic cooperation projects with universities and scientific institutions, AIT increases its access to well-qualified employees in the course of concrete project work. The "Recruiting" department supports the entire AIT recruiting process, from requirement definition all the way to professional search. New IT tools increase transparency and effectiveness throughout the process and complement the contribution of recruiting to strengthening the AIT employer brand.

## Product and environmental risks

Product and environmental risks may arise in the course of laboratory operation with hazardous materials during storage, handling and disposal. Possible effects obtain in associated incidents with immediate effect on individuals and the environment. AIT is therefore taking into account high (safety) technical standards for the use of hazardous materials, and these are subject to consistent monitoring of quality requirements and standards.

## Infrastructure and location rehabilitation risks

In recent years, intensive measures have been taken to implement the location and space concept of AIT and its subsidiaries. This applies both to the main location in Vienna and to the Seibersdorf location, where a significant improvement in the surface structures – both technically and in terms of the usability of the surfaces – was achieved through new construction. Nevertheless, additional measures are necessary at the Seibersdorf location to improve the structural condition of the buildings and the general infrastructure. In addition, extensive demolition measures will now follow to clean up the old building structure after the construction of new buildings at the Seibersdorf site. Overall, these measures effectively counteract the risks of plant shutdowns and risks in the safety of the site.

## Overall risk

When analyzing the risks, no situations that would jeopardize the continued existence of the company at present and in the foreseeable future could be identified.

A clear management and corporate structure obtains in the Centers, the divisions, the company and the Group. Cross-departmental key functions are managed centrally by the company, with the individual companies of the Group having a high degree of autonomy at the same time, in particular with regard to operation-related processes.

The accounting regulations-related internal control system of AIT ensures that accounting records are checked for mathematical and factual correctness. The material check for the release of bills and receipts takes place in the respective organizational units or subsidiaries and the financial and accounting procedures for all organizational units are then centrally managed at AIT – intensively supported by digitized processes and systems. This IT system-supported, centralized management of financial and asset accounting at AIT, with creditor and debtor management and the complete management of all incoming payments and outgoing payments, ensures a comprehensive functional separation of operational and financial processes across the Group.

The functions of the departments which are significantly involved in the accounting process, i.e. accounting and treasury, controlling and business administration, IT, as well as HR, legal, and procurement, are clearly separated. The areas of responsibility are clearly assigned.

The financial systems used are protected against unauthorized access by corresponding IT systems. Standard software is used in the area of financial and management systems.

An adequate policy and process management (e.g. for management, business, controlling, resources and support processes) has been established and is constantly being updated and further developed. The electronic incoming invoice recording with electronic release workflow is comprehensively used throughout the AIT Group. The electronic processing of invoices as well as the complete release of invoices for payment in the system ensure a high transparency and reliability as well as the maintenance of the process discipline (e.g. four eyes principle).

The ICS, in particular accounting-relevant processes, is regularly checked by the process-independent internal audit team.

The internal control and risk management system with regard to the accounting process, whose essential features have been described above, guarantees with sufficient certainty that entrepreneurial events are accurately recorded in the books, processed and thus properly incorporated into the external accounting.

# INTERNAL AUDIT DEPARTMENT

The Internal Audit Department, which is directly responsible to the management of the company, supervises the operational and business processes as well as the Internal Control and Risk Management System. In particular, the functionality and effectiveness of the Internal Control System and the Risk Management System, the compliance with applicable legal and operational policies, the regularity of all operational processes as well as measures for the protection of company assets are to be examined and assessed in this context.

The audits are carried out according to the annual audit plan approved by AIT management and supplemented by short and special audits. The audit reports make recommendations and propose measures which are subject to an ongoing follow-up following the implementation instruction by management.

# FORECAST REPORT / PERFORMANCE INDICATORS STRATEGIC DEVELOPMENT

The financing agreement with the BMK (Federal Ministry of Transport, Innovation and Technology, formerly bmvit) forms the basis for the strategic development of the AIT Group. For the reporting year 2019, financing was continued on the basis of the agreement for the years 2019–2021. The financing agreement contains both financial and non-financial target indicators for the company which are regularly reported on and tracked as part of the work of the Monitoring Committee of the Supervisory Board. A selection of non-financial indicators is presented below.

# INDICATORS FOR SCIENTIFIC SUCCESS MEASUREMENT

The following table shows a selection of indicators for the scientific success measurement of the AIT Group. These indicators have been developed in the context of the BMK (formerly bmvit) financing framework agreement.

Scientific & Performance Indicators	AIT 2019	AIT 2018
Patents granted (patent families)	29 (28)	45 (36)
Publications in scientific peer review journals with impact factor	211	213
Impact Factor	698.5	770.2
Publications in scientific peer review journals without impact factor	69	67
Publications as part of conferences (with review process)	330	335
Publications as part of conferences (without review process)	126	134
Invited Lectures	351	293
Lectures	162	139
Number of PhD students	203	213
Number of PhD students from the international arena	88	93
Proportion of PhD students from the international arena (%)	43 %	44 %
Completed dissertations	33	28
Completed diploma theses	70	64
Number of habilitated employees	31	28

# EVENTS AFTER THE BALANCE SHEET DATE

No events of special significance have occurred after the balance sheet date that would have led to a different presentation of the asset, financial and earnings position.

Management:



DI Anton PLIMON e. h.



Prof. Dr. Wolfgang KNOLL e. h.

Vienna, 13 March 2020

# BALANCE SHEETS

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# GROUP CONSOLIDATED BALANCE SHEET

1 January 2019 through 31 December 2019

	EUR	EUR	Status as of 31 Dec. 2019 EUR	Status as of 31 Dec. 2018 kEUR
<b>A. FIXED ASSETS</b>				
I. Intangible assets				
1. Concessions, rights		1,316,097.16		1,388
II. Property, plant and equipment				
1. Land, rights to land and buildings, including buildings on land owned by third parties	31,108,854.41			32,985
2. Technical equipment and machinery	27,154,944.57			26,405
3. Other equipment, plant and office equipment	11,264,269.53			11,451
4. Advance payments made and plants under construction	7,420,079.02			6,373
		76,948,147.53		77,214
III. Financial assets				
1. Holdings	710,835.60			633
2. Securities (book-entry securities) of fixed assets	13,683,811.09			13,539
		14,394,646.69		14,172
			92,658,891.38	92,775
<b>B. CURRENT ASSETS</b>				
I. Inventories				
1. Raw materials, auxiliary materials and supplies		2,704,160.33		572
2. Not yet billable services				
Non-funded customer projects	9,230,904.18			8,413
less advance payments received	-6,160,734.37			-5,596
Funded research projects	83,348,163.61			81,846
less advance payments received	-69,212,283.36			-70,390
		17,206,050.06		14,273
		19,910,210.39		14,845
II. Receivables and other assets				
1. Receivables from deliveries and services	11,813,041.46			9,904
2. Receivables from associated companies	182,566.92			132
3. Other receivables and assets	1,340,994.12			1,445
of which with a residual term of more than one year	14,222.52			2
		13,336,602.50		11,481
III. Cash on hand, credit balances with credit institutions		71,023,473.19		85,234
		104,270,286.08		111,561
<b>C. DEFERRED ITEMS</b>				
1. Other			1,908,030.24	2,186
<b>D. DEFERRED TAX ASSETS</b>			560,241.74	523
			<b>199,397,449.44</b>	<b>207,045</b>

	EUR	Status as of 31 Dec. 2019 EUR	Status as of 31 Dec. 2018 kEUR
<b>A. EQUITY</b>			
I. Called and paid-in share capital	470,920.12		471
II. Capital reserves (unappropriated)	13,656,321.07		13,656
III. Retained earnings			
1. Legal reserve	47,092.01		47
2. Other reserves (free reserves)	1,466,518.51		1,467
IV. Net profit	30,912,096.86		26,863
thereof profit carried forward 26,863 kEUR (2018: 23,633 kEUR)		46,552,948.57	42,503
<b>B. INVESTMENT GRANTS FROM THE SHAREHOLDER</b>	33,676,960.84		32,875
<b>C. OTHER INVESTMENT GRANTS</b>			
I. Investment grants by the public sector	40,402,722.42		40,848
II. Other investment grants	335,380.57		518
		40,738,102.99	41,365
<b>D. PROVISIONS</b>			
1. Provisions for severance payments	5,866,571.00		5,818
2. Provisions for pensions	224,614.06		207
3. Provisions for taxes	19,538.55		282
4. Other provisions	22,047,857.76		20,582
		28,158,581.37	26,888
<b>E. LIABILITIES</b>			
1. Liabilities towards credit institutions	0.00		1,279
of which with a residual term of up to one year	0.00		1,279
of which with a residual term of more than one year	0.00		0
2. Advance payments received on orders	12,709,052.93		11,498
of which with a residual term of up to one year	2,698,110.92		2,018
of which with a residual term of more than one year	10,010,942.01		9,480
3. Liabilities from deliveries and services	7,074,281.44		6,490
of which with a residual term of up to one year	7,013,928.72		6,441
of which with a residual term of more than one year	60,352.72		49
4. Liabilities to affiliated companies in which a participating interest is held	74,410.86		0.00
of which with a residual term of up to one year	74,410.86		0.00
of which with a residual term of more than one year	0.00		0.00
5. Other liabilities	19,127,278.98		31,116
of which with a residual term of up to one year	7,399,431.20		7,486
of which with a residual term of more than one year	11,727,847.78		23,630
of which from taxes	597,384.51		1,082
of which with a residual term of up to one year	597,384.51		1,082
of which for social security	2,011,209.03		1,929
of which with a residual term of up to one year	2,011,209.03		1,929
		38,985,024.21	50,383
of which with a residual term of up to one year		17,185,881.70	17,224
of which with a residual term of more than one year		21,799,142.51	33,159
<b>F. DEFERRED ITEMS</b>			
1. Other		11,285,831.45	13,029
		<b>199,397,449.44</b>	<b>207,045</b>



# GROUP CONSOLIDATED PROFIT AND LOSS STATEMENT

1 January 2019 through 31 December 2019

	2019		2018	
	EUR		kEUR	
1. Revenues	60,332,541.82		57,790	
2. Funding, research grants				
a) Funding	34,831,787.69		33,013	
b) Research grants from the shareholder	49,778,943.00		50,373	
c) Service revenues	3,965,880.34	88,576,611.03	3,475	86,861
3. Change in the stock of finished products and not yet billable services	2,320,069.23		1,990	
4. Other operating income				
a) Income from the disposal of fixed assets with the exception of financial investments	4,252.00		134	
b) Income from the reversal of provisions	1,513,974.73		1,279	
c) Other	10,228,120.85	11,746,347.58	10,713	12,126
5. Expenses for material and other purchased manufacturing services				
a) Material expenses	-8,294,257.54		-7,663	
b) Expenses for purchased services	-10,042,959.47	-18,337,217.01	-10,225	-17,888
6. Personnel expenses				
a) Wages and salaries				
aa) Wages	-49,608.38		-60	
ab) Salaries	-73,673,980.89		-70,652	
b) Social expenses				
ba) Expenses for pensions	-1,363,044.89		-1,283	
bb) Expenses for severance payments and company pension funds	-1,407,481.10		-1,699	
bc) statutory social security contributions	-19,359,002.04		-18,584	
bd) Other social expenditures	-986,492.01	-96,839,609.31	-927	-93,206
7. Amortization of intangible assets of fixed assets and property, plant and equipment	-11,031,660.15		-11,451	
of which extraordinary depreciation -185,031.62 EUR (2018: -653 kEUR)				
8. Other operating expenses				
a) Taxes, other than under item 18	-32,975.46		-58	
c) Other	-32,716,607.35	-32,749,582.81	-32,456	-32,514
<b>9. Subtotal of items 1 to 8 (operating result)</b>	<b>4,017,500.38</b>		<b>3,709</b>	

	2019		2018	
	EUR		kEUR	
10. Income from investments	62,667.87		117	
11. Income from other securities in financial assets	102,099.33		213	
12. Other interest and similar income	17,026.60		69	
13. Income from the disposal and amortization of financial investments and securities in financial assets	219,128.22		23	
14. Expenses from financial investments of which amortizations -52,200.42 EUR (2018 -429 kEUR)	-52,200.43		-436	
15. Interest and similar expenses	-35,523.05		-72	
<b>16. Subtotal of items 10 to 15 (financial result)</b>	<b>313,198.54</b>		<b>-86</b>	
<b>17. Result before taxes</b>	<b>4,330,698.92</b>		<b>3,622</b>	
18. Taxes on income and earnings of which deferred taxes 70,452.19 EUR (2018: 4 kEUR)	-281,102.09		-393	
<b>19. Result after taxes; annual net profit</b>	<b>4,049,596.83</b>		<b>3,229</b>	
20. Profit carried forward from previous year	26,862,500.03		23,633	
<b>21. Net Profit</b>	<b>30,912,096.86</b>		<b>26,863</b>	

## Imprint

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