# 

ELECTRICAL ENGINEERING



# Sustainability Report



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# 102-14 LETTER FROM THE MANAGEMENT

Every year, our Sustainability Report showcases the great commitment of our employees to make the Institute as sustainable and its impact on the society and environment as positive as possible. We report on socially responsible management, correct and ethical business practices, environmental impact, product and service development, as well as the total economic impact and added value to society. We are also monitoring our contribution to achieving the United Nations 2030 Sustainable Development Goals in the areas we know our impact would be the greatest.

Despite the expectations that the extraordinary circumstances would normalize, the difficulties in sending associates to the field, especially abroad, as well as problems with equipment delivery and commissioning continued throughout 2021. Disruptions in the supply chain have also not been eliminated entirely. Many scheduled fairs and congresses have not been held, some of them causing cancellation costs.

Despite the pandemic-related difficulties, in 2021 the Institute achieved significantly better results than in 2020 and successfully concluded most of the planned activities and contracts. Sales revenue increased by 26%, while total revenue increased by 23% compared to 2020. Activities that were significantly reduced or put "on hold" in 2020 intensified in the past year. With significant engagement, we ended 2021 with a 66% increase in exports, a 28% increase in the KONČAR Group sales compared to 2020, while sales within Croatia decreased by 10% compared to 2020.

2021 will also be remembered for the implementation of the KONČAR 2020+ integral Strategy, with sustainable development and openness to new technologies and business models as its main pillars. The Institute, as well as other Group companies, are expected to invest in the development of strategic competencies, product and services portfolio expansion, revenue growth, and effective profitability management. Market repositioning of Group companies and the new KONČAR branding adopted late in 2021 will help achieve the set goals. The Institute was restructured from a joint stock company to a limited liability company in November to help implement the Integral Strategy and the new operational model.

With the introduction of the new operational model for financing of the KONČAR Group's strategic research projects, the Institute received the necessary "momentum" for research and development activities. Apart from investing in its own research and development project and supporting the development of other Group companies through commercial agreements, the Institute will also lead strategic research projects.

The new model is expected to help increase the investment in new product and technology development, development

of new competencies, help create jobs, as well as longterm stability and sustainable development of the entire Group. Late in 2021, the Digital Factory Lab (DFL) was established. This is a digitalization technology center project led by the Institute. The project is important since it offers the opportunity for additional horizontal connections between Group companies, growth of new competencies and better collaboration with suppliers and stakeholders from the academic and economic communities.

0.49 mill. € was invested in 2021 in the reconstruction of the administrative building (P-building) envelope and the fire escape stairway, enhancing the safety of employees, energy efficiency, as well as significantly reducing energy cost and the environmental footprint. The construction work on the new multipurpose building LAVESP – Laboratory for Power Systems and Drives also started this year. This is the Institute's largest and the most important investment since 1971, with an estimated value of 7.55 mill. €. LAVESP is very important for the continuity and development of HV equipment testing, and its specifications equal those of the world's renowned laboratories.

In 2021, we have also adopted additional employee training programs to help retain current employees and develop strategic competencies. Other activities are also planned to empower managers and key employees in leadership and communication skills. Most of the programs will be implemented with the support and organization by the Group, while some of the activities will be internal within the Institute.

This report also includes an overview of the Institute's past 60 years, titled "The Strength of Great Ideas". During the 60 years of scientific research dedicated to creating new and innovative products, equipment, and services the contribution of the Institute's experts to the fields of transformers, rotating machines, HV equipment, energy converters and railway vehicle components has been significant.

The Institute will continue to have a key role in KONČAR's corporate development since it not only initiates the Group's new production programs, but also helps innovate the existing solutions. The Institute's business strategy includes sustainable development and social responsibility along with the development and fostering of partnership relationships with all stakeholders, always observing international quality, environmental and safety standards.

Zagreb, June 2022

Managing Board Siniša Marijan, PhD, President Dalibor Filipović-Grčić, PhD, Member

#### **Abbreviations used in the Report**

- the Institute .
  - the Group, KONČAR Group
- Parent Company •
- CSR
- **GRI Standards**
- SD
- SDG
- UN GC .

- MEP
- TCMS
- HVDC

- CENELEC
- VA
- SCERT •
- LAVESP

KONČAR – Electrical Engineering Institute Ltd.

- KONČAR Electrical Industry Inc. and subsidiaries
- KONČAR Electrical Industry Inc.
- Corporate social responsibility
- GRI **Global Reporting Initiative** 
  - **GRI** Sustainability Reporting Standards
  - Sustainable development
    - Sustainable Development Goals
  - **UN Global Compact**
- RDI Research – development - innovations
- TMS Transformer monitoring system
  - MCM System for machine condition monitoring and fault detection
    - Electromagnetic field monitoring system
    - Train control and management system
    - High Voltage Direct Current
  - LCC Life Cycle Costs
  - RAMS Reliability, Availability, Maintainability, and Safety
    - European Committee for Electrotechnical Standards
    - Value added
    - **Certification Service** 
      - Laboratory for Power Systems and Drives



60 years of scientific research dedicated to creating new and innovative products and services

# THE STRENGTH OF GREAT



#### Prof. Eng. Zlatko Plenković Director

25. 3. 1961 – 6. 10. 1972

The organization of the Institute's work and the integration of development activities and technical offices in individual factories were assigned to the first director, engineer Plenković. His previous roles had given him considerable experience and a good overview of Končar's needs and its position on the global market.

He spent his entire career in Končar, at first working on the electric motor engineering, and later, with a more significant contribution, on the mercury rectifier production.

Success and lifelong learning, foundations and priority tasks laid by engineer Plenković, lead the Institute's development to this day.



#### Prof. Božidar Frančić, PhD Director

06. 10. 1972 – 14. 11. 1977

Professor Frančić was assistant director from 1966 until 1972 when he became director. His organizational skills gave impetus to the Institute's development and growth, improving its scientific and research work. He gave priority to Končar's own strengths and its own solutions as preconditions for unobstructed further growth and development of the entire Končar company.

He started working in Končar on generator development and design, and his special contribution was the invention of self-excited compound winding of a synchronous machine. After his term of office as director of the Institute, he became the head of RO Product Development and Production, and from 1986 until his death he was the president of "Rade Končar".

# The Strength of Great Ideas



The independent Electrical Engineering Institute of RADE KONČAR company (today KONČAR – Electrical Engineering Institute) was founded on 25 March 1961 with the objective of further development of the production programme and technologies. The workers' council decided to establish the institute as they considered it was necessary to separate research and development, in terms of equipment and human resources, from the operational part of the company in order to ensure more autonomous and faster development. People who were managing the company in that period believed it was far more important to create own knowledge than to buy solutions from others and that independence was achieved by incorporating that knowledge into new products.

Organizational changes were stimulated by increased needs to continue industrializing the country, as well as by the opening of new markets in less developed and developing countries, while the Western competitors created additional pressure with new technical solutions and a lower price.

The Institute's research work was financed through a fund and all plants paid a certain percentage from products into that fund.

On 6 July 1961 it was registered as an independent scientific institution in the Scientific Council Registry of the People's Republic of Croatia.





1961





A growing number of collaborators and requests to develop new products intensified the construction of premises with laboratories on the ground floor and offices on upper floors. The construction of new buildings with numerous laboratories was accompanied by the purchase of laboratory equipment and computers, at first analogue and later also digital ones, used for applied research, innovation of existing products and development of new products.

Several business facilities and laboratories were built: in 1965 the building of the Institute for Rotating Machines was constructed and a prototype workshop on the ground floor was extended; in 1969 the High-Power Laboratory was built and equipped for short circuit testing with low voltage and high power; in 1971 the Rotating Machines Laboratory was opened, which consisted of energy and mechanical block, testing area, acoustic, climate and ventilation laboratory.

The facilities currently owned by the Institute are located in three locations in Fallerovo-Trešnjevka and all were either reconstructed or they are currently undergoing reconstruction. The reconstruction process was largely accompanied by conversion of space, all in accordance with the Institute's new market orientation and the need for experimental R&D trials of future market products and services.



 New equipment and the generator for highvoltage testing at the High Voltage Institute and devices for short-circuit testing and research of low voltages and high power at the Institute for High Power were put into operation. (1963)

- 2. The production of routing and regulating devices was established. At the Institute for Regulation the development and design of the digital management system was initiated. (1964)
- 3. The remote-control device for the helm was developed at the Institute for Regulation, consisting of a steering column, a switch cabinet and a limit switch with selsyn. (1967)
- 4. In the production of test equipment of the Institute, six capacitors for measuring the transmission ratio and the connection group of power transformers were made. The product was in high demand in the country because it allowed laboratories and test stations to reliably measure all ratios up to 1: 1000. (1967)
- 5. At the transformer production site, a modern Test station and a HV laboratory for testing large transformers up to 240 MVA and voltages up to 400 kV were opened in 1967.
- The automatic rotational speed regulator for DC motors from 0.5 to 15 kW was developed at the Institute for Automatic Regulation. The regulator is completely transistorized and has a thyristor output. (1967)
- 7. The Institute signed a long-term agreement on licencing and cooperation in the field of industrial (energy and control) electronics with the Swedish company ASEA (ABB). (1972)
- 8. In the early 1970s rapid development of railways began with a new generation of traction vehicles with thyristor energy converter for the power supply of DC traction motors stronger than 1 MW and electronic control and regulation units in the main and auxiliary drives of vehicles. That development was initiated by European companies: Swedish company ASEA and French company ALSTOM, while Končar joined them very soon with research and development of the thyristor locomotive.



**Dimitar Manđurov, BSc** Director 14. 11. 1977 – 22. 9. 1988

Engineer Manđurov started working in the Electrical Engineering Institute in 1964, and in 1977, thanks to his organizational skills, he was appointed director. He takes the credit for organizing R&D work in mechanical technology, which filled a large void in developmental and technical activity of the Institute.

He led a number of developmental tasks: the development of a direct water-cooling system of active parts of the generator, the development of a new mechanism for minimum oil circuit breakers, the design and production technology of magnetic keys for electrical machines, the development of technology and devices for casting aluminium cage rotors, the procedure and the device for the application of thermoplastic insulations in small engines. Some of his original technical solutions were also patented.



**Boris Gvozden, MSc** Director 22. 9. 1988 – 21. 12. 1990

Acting director from 1988 until the company declared bankruptcy in 1990.

He worked on the development and production implementation of regulated electric motor drives, the development of automatic processes in metallurgy, ironworks, steelworks and foundries and the development and production implementation of the racket system. As head of the Institute's Special Purpose Sector and the manager of the A-85 Programme in Končar, he introduced methods for programming and production development planning.

Also, he established the quality assurance concept and the laboratory for testing devices in various environmental conditions and he introduced cutting-edge mechanical processing technologies.

# KONČAR Gains Global Reputation



From the very beginning, the main task of the Institute was to unite R&D potential to achieve faster growth of Končar's production programme. These are the most significant results achieved in the 1980s:

- electrical machines design methodologies and their further development with innovative solutions
- development of measuring devices and equipment for testing electro-technical products in laboratories and in production
- development of mining, shipbuilding and industry equipment
- development of thyristor locomotive as a crown of RADE KONČAR company's engineering achievement in the 1980s.

In 1989 the Institute's R&D projects were financed through contributions paid by other companies in the amount of 5.64 percent of their income, which was not enough to cover the costs of the Institute's cumbersome and inefficient organization.

The establishment of new market relations, which began with the adoption of the Enterprises Act, and later the Companies Act, led to abrupt cessation of the Institute's work towards the end of 1990.





From 1946 to present day many foreign statesmen, government members, eminent people, state officials of the former Yugoslavia and presidents and high-level state officials of the Republic of Croatia have visited Končar. Almost all visits included a tour of factory facilities and the Institute's testing laboratories, especially the High Voltage Laboratory, and later also other newly-built laboratories.

Here is a chronological list of some of those visits: 1955 -Nikita Sergeyevich Khrushchev, President of the USSR Government, 1956 - Gamal Abdel Nasser, President of the UAR, 1957 - Ho Chi Minh, President of the Democratic Republic of Vietnam, 1956 - Ahmed Sukarno, President of the Republic of Indonesia, 1959 - Ernesto Che Guevara, revolutionary from Latin America, 1960 - Mohammad Zahir Shah of Afghanistan, 1969 - Giuseppe Sarragat, President of the Italian Republic, 1971 - Amir Abbas Hoveyda, President of the Iranian Government, 1974 -Jose Figueres Ferrer, President of the Republic of Costa Rica, 1981 - Robert Mugabe, President of the Zimbabwean Government, 1983 - Hu Yaobang, General Secretary of the Chinese Communist Party, 1987 -Gustav Husak, President of Czechoslovakia, 1992 - Ivan Supek, Full Member of the Croatian Academy of Sciences and Arts. 2004 - Anelia Krushkova, Deputy Minister of Transport of Bulgaria, 2011 - President of the Republic of Croatia Ivo Josipović, and many others.



1. The building of the Institute for Transformers next to the High Voltage Laboratory was built in 1978 and it was reconstructed in 2010.

- 2. Transformer diagnostics initiated in the 1970s and for that purpose a mobile testing station was set up. The mobile station for controlling the accuracy class of instrument transformers was established in 1980.
- 3. The gas chromatography method for the analysis of gases from transformer oils was introduced as the most efficient method for the assessment of the overall condition of transformer insulation system. From 1979 to present day more than 40,000 analyses have been conducted and many transformer failures have been prevented and detected.
- 4. In 1980 the Institute received the City of Zagreb Award for exceptional results.
- 5. Končar's own development, with an enormous contribution of the Institute, resulted in a 4400kW thyristor locomotive with supply voltage of 25 kV, 50 Hz, four axles and speed up to 160 km/h. As much as 85 percent of the equipment traction motors, transformers, thyristor converters, control electronics, switching devices, fans, etc. - was produced in Končar, and by 1990, 16 of them had been produced.
- 6. The so-called P-object, administrative building of the Institute with laboratories on the ground floor was built in 1985. In order to increase the energy efficiency of the building, in 2011 all external windows and doors were replaced, while in 2021 the renovation of the entire building envelope and the fire escape stairway was initiated.
- 7. The development of vacuum breaking chambers for 7.2 kV rated voltage contactors was completed in 1986.
- 8. The development of a digital system for positioning, managing and regulating the flying saw in Sisak Ironworks and the scissors in Zenica Ironworks was completed in 1987.
- 9. On 21 December 1990 the company RADE KONČAR – Electrical Engineering Institute declared bankruptcy.



#### Asst. Prof. Ante Miliša, PhD

31. 12. 1990 - 30. 3. 1999

After the bankruptcy of the Electrical Engineering Institute, Dr Miliša, as director of the new Institute, accepted the task to gather experts and scientists and to set and direct the Institute's development and operations according to the market principles.

He held that office until 1999, and subsequently he was a member of the multi-member board until he retired in 2003.

After the first decade of operating in new conditions, the Institute, under the leadership of Dr Miliša, positioned itself strategically in the market. It started working on a commercial basis with teams of experts who will ensure further revenue growth, higher standards and higher profit needed for a faster future development and contribute to innovation and the development of new production programmes of the Končar Group.



Assoc. Prof. Stjepan Car, PhD President of the Managing Board 31. 3. 1999 – 31. 12. 2013

From 1991 Professor Car was a member of the Managing Board of the holding company KONČAR – Electrical Industry Inc., in charge of corporate development and the business segment Industry. From 1999 until he retired, he was the President of the Institute Managing Board.

During his career, apart from managerial duties, he conducted many other activities aimed at promoting science, economy and technical culture. He led several scientific and technological projects cofinanced by the ministry and he mentored doctoral students in the field of electrical machines.

He advocated the need to develop equipment for renewable sources and for the application of new technologies, such as ICT, hydrogen technology and nanotechnology. It was mainly his idea to direct both the Institute and Končar towards renewable sources, and he also takes the credit for connecting the Institute with the academic community. **A New Beginning** 



On 21 January 1991 the company KONČAR – Electrical Engineering Institute was entered in the commercial register as the successor of the Electrical Engineering Institute, but on new foundations. By decision of the Management Board of the holding KONČAR - Electrical Industry Inc., the Institute kept its role of a central place for providing applied R&D services, but also other services given the existing knowledge of former employees and market needs inside and outside Končar.

The reorganized Institute immediately faced a great challenge. Until 1990 all operational costs at the Institute were financially covered by annual financing plans, but the new reorganization did not prescribe such an obligation. Instead, the companies within the Group do business with the Institute purely on market principles, even without applying the right of pre-emption within the Group.

During the 1990s the Institute changed its role in Končar and it found new opportunities. It managed to win the market with new services of electrical equipment diagnostics and technical monitoring in production and installation of electrical equipment. In addition, it was organized for testing and certifications. Nonetheless, it did not neglect research and development in the field of industry electronics, with a special focus on energy converters for rail vehicles and control systems.





Laboratory for Physical and chemical testing

The Ministry of Science and Education accredited the Institute as a private scientific organization and it was entered in the Register of Scientific Organizations. As a company specialized for applied research in electrical and mechanical engineering, it has two important roles:

- support, based on market principles, for the development of solutions produced and sold by the companies within the KONČAR Group, i.e., providing specialized knowledge and R&D testing services in modern Institute laboratories
- applied research with own investment to develop new solutions compatible with the Group's production programme for which the Institute takes the risk of development and sale on the market.

The Institute's business activities took place in different centres with the support of joint services, and within each centre there were departments and laboratories. By the end of 2020, the Institute was organized in 6 smaller institutes, profit centres specialized for transformers, rotating machines, devices, materials and technology, energy electronics, management and renewables, and electromagnetic compatibility, safety and calibration.

The smaller institutes were comprised of departments and laboratories orientated towards applied research, testing and acquiring knowledge – they were centres of knowledge. As a rule, project developers were smaller institutes and they used resources of other profit centres too.



1. In 1993 the digital voltage regulator for synchronous machines excitation systems was developed by the Institute, and the company KONČAR – Electronics and informatics delivered it to the hydroelectric power plant Fala in Slovenia. The Institute continued to develop its own platforms of embedded computer systems based on the adopted solutions and acquired knowledge. Those platforms later contributed to the realization of numerous solutions for rail vehicles and electric power industry.

- In 1994, Croatian Railways, the Institute and KONČAR

   Electronics and informatics signed an agreement
   on the development and delivery of four-system 50
   kVA VIS wagon converters. The development was
   completed in 1997, and in 1998 the innovation
   received the Golden Marten, awarded by the Croatian
   Chamber of Economy.
- 3. The train heating converter was developed, used in diesel-electric locomotives so that the wagons have the same power supply system as when they are pulled by electric locomotives. The product was considered a rarity worldwide and it received the highest recognition at INOVA 1996.
- In 1996 a combined instrument transformer was developed together with KONČAR – Instrument Transformers Inc. The solution received the annual state award for science for a unique technical solution.
- 5. In 1997, a contract was signed with KONČAR Electric Locomotives regarding the development and delivery of a digital regulation and control system for thyristorization of diode locomotives and for the development of converters for powering auxiliary drives and charging batteries. The first systems were built into Bulgarian locomotives, followed by the modernization of about 120 railway locomotives in Croatia, Bosnia and Hercegovina, Serbia, Macedonia, Romania, Bulgaria and Turkey.
- 6. Quality management system certificate according to EN ISO 9001:1994. (1997)
- 7. In 1999 the High Voltage Laboratory obtained the first authorization according to the norm HRN EN 45000.
   It was the beginning of the realization of the accreditation plan for all laboratories of the Institute.
- A new solution for metal-enclosed busbars 10 kV, 2000 A adjusted to working in aggressive environment was delivered to Petrokemija, Kutina. (1999)

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#### Asst. Prof. Ivan Bahun, PhD Member of the Managing Board

25. 5. 2001 – 31. 8. 2005

Dr Bahun started working in the Institute in 1985. He pursued scientific research and led several successful projects focused on energy electronics and control systems in transport and energy sectors. The teams under his leadership received several prestigious awards for innovation, and a special one is the Golden Marten for the foursystem converter, the best innovation in 1997.

In 2001, he became a member of the Institute's Managing Board, and in 2003, in addition to this position, he was appointed project director of the CROTRAM consortium, consisting of Končar, TŽV-Gredelj and Đuro Đaković, for the production of 142 low-floor trams for the city of Zagreb. In 2005 he was appointed President of the Managing Board of KONČAR - Electric Vehicles, and in 2020 he joined the Management Board of KONČAR – Electrical Industry Inc.



#### **Miroslav Poljak , PhD** Member of the Managing Board 1. 5. 2003 - 31. 3. 2011

Dr Poljak started working in the Institute in 1978, first on research and development of instrument transformers, then as head of Department for Instrument Transformers and High Voltage Laboratory, after which he became manager of the Institute for Transformers. He advocated the Institute's engagement in the field of electrical equipment monitoring, and today this is a successful Institute product with great market potential.

He won the State Award for Science for the combined transformer type VAU.

In 2003, he became a member of the Institute's Managing Board, and in 2011, he accepted the position of a member of the Managing Board of KONČAR - Electrical Industry, where he was in charge of corporate development.

2000

# Investment in Future Generations



Years of investing in applied research, especially in professional development of employees, and continuous rejuvenation of the staff profile led to hiring a large number of young engineers, which created great potential to develop innovative products and services.

Thanks to the business policy aimed at establishing a favourable climate for creative and innovative work and influx of new knowledge through continuing education and scientific research, many Institute collaborators have advanced in their academic titles. From 1961 to present day 117 associates have earned their master's degree and 53 have earned their PhD degree in areas of interest for KONČAR.

Today the Institute associates are offered opportunities for professional development, foreign language and IT courses, as well as training programmes for quality assurance systems, environmental protection and safety at work. New knowledge is acquired through graduate and postgraduate doctoral and specialist studies, but also by working on R&D tasks in mixed teams composed of Končar Group companies, at seminars and through active participation in international conferences and exhibitions. Creativity is promoted and leadership skills are encouraged through training programmes for managers.





The Institute evolved into a recognized R&D company where the best and most promising experts and scientists wish to work on complex tasks. It offers high standards to its employees (pleasant working environment, favourable conditions for R&D activities and acquisition of higher academic titles), while especially fostering teamwork and competitive spirit so that employees can achieve excellent results in product development and create Končar Group products that successfully compete on the global market.

The Institute has incorporated sustainability and CSR principles into its work. This was recognized in 2008 with the assignment of the first CSR Index Award for the best application of corporate social responsibility practice. By 2017, the Institute confirmed the continuity of its CSR practices and received six CSR Index Awards.

In 2013, it received the European CSR Award for innovative partnership between economic and non-profit organizations with the project Applied Science Leads to Innovation (PRIZNADI).



 Declaration of Independence and Autonomy of KONČAR – Electrical Engineering Institute. (2000)

- 2. Beginning of research on renewable energy sources. (2000)
- 3. In the hydroelectric power plant Vuhred in Slovenia the company KONČAR – Electronics and Informatics replaced the first Končar generator excitation system from 1954 with a new digital voltage regulator developed in the Institute. (2002)
- 5. In 2004, with the help of the Institute, KONČAR Engineering Co. for Plant Installation & Commissioning produced and installed a 20-kA busbar system for the power supply of the superconducting CMS magnet, as part of the LHC (Large Hadron Collider) accelerator construction in the European Organization for Nuclear Research CERN in Geneva.
- 6. The first of 142 low-floor trams TMK2200 and TMK2300 was delivered to ZET (Zagreb Electric Tram) in 2005, and its main control systems and electronic power converters were developed and tested in the Institute.
- 7. The transformer monitoring system (TMS) delivery began in 2005. In the following years, the TMS conquered the Middle East market (Qatar, Saudi Arabia, Oman, UAE, Jordan).
- 8. The rotating machines monitoring system was developed, and the first one was built into the hydroelectric power plant Čakovec in 2006.
- 9. The Product Certification Service SCERT was accredited. (2008)
- 10. The electric multiple unit prototype for Croatian Railways was completed in 2009, for which the Institute developed propulsion and auxiliary converters, as well as the control and communication system. The EMU was presented in 2010 at the largest railway industry fair InnoTrans in Berlin.

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#### Siniša Marijan, PhD

Member and President of the Managing Board

1. 4. 2011 – present

After graduating from university, in 1984 Dr Marijan got a job at the Institute, where he held a number of different positions, from development associate to project manager and department head, until he joined the Institute's Managing Board.

He has led various development projects which resulted in new products, such as the development of hardware and software platform for digital voltage regulators, and main computers for trams, locomotives and trains. In addition, he was in charge of the development of software and hardware support for other devices in the field of electric traction such as control electronics of power converters for main and auxiliary drives of trams, locomotives and trains, and the development of processor units, system software support and software tools for the four-system wagon converter and train heating converters. He also led the development of built-in control electronics for wind turbine and wind farm control systems.



#### Rajko Gardijan, BSc

Member of the Managing Board 1.3.2014 – 31.3.2020

Engineer Gardijan started working at the Institute in 1985 and he worked in development, testing and monitoring of high voltage power equipment. He was the head of the High Voltage Laboratory and the manager of the Institute for Transformers.

He excelled in organizational skills, and thanks to many years of experience in managing laboratories and participating in projects to modernize the existing and build new laboratory infrastructure, until his retirement he had a leading role as infrastructure coordinator, consultant and advisor for the construction of the new laboratory for large electrical machines and traction systems.

# With Innovative Solutions to Global Success



Thanks to a continued scientific development of its associates and the collaboration with research organizations and the business sector, the Institute successfully uses its own scientific potential with a special focus on applied research that meets market needs and in the long run results in innovations.

In terms of economic significance, the following products and services stand out as a result of applied research and development in the field of transport: control systems, visualization systems, control regulation, protection and communication systems in rail vehicles and electronic power converters in locomotives, wagons, trams and trains.

Another important area of applied research and development is the electric power industry, where the Institute has developed several successful products and services: transformer monitoring system, rotating machines monitoring system, switching equipment monitoring system, non-ionizing radiation monitoring system and laboratory and field diagnostic testing methods for electrical equipment.





For achieved results and contribution to the Institute's success with the application of new technologies, its employees received a number of prestigious awards for applied research, development and innovation in the field of electric power and electric traction. Some more important ones are listed here:

HGK GOLDEN MARTEN for the best innovation in Croatia four-system wagon converter for European wagons, 1997 | HGK GOLDEN MARTEN for the contribution to innovation development in Croatia in 2006 | IFIA GOLD MEDAL for the monitoring system of the generator - transformer block, Bucharest, 2007 | ARCA GRAND PRIX for applied research and development of the wind turbine, Zagreb, 2008 | ARCA GRAND PRIX for the low-floor electric multiple unit, Zagreb, 2009 | World Communication Award 2012 in "The Green Award" category for the best green product KONČAR Hybrid Box, hybrid autonomous system for base stations power supply, London, 2012 | Grand Prix ARCA 2014 for low-floor diesel multiple unit. | ARCA Golden Plaque 2014 for KONČAR BIM – bushing monitoring system. | ARCA Silver Medal 2015 for SCVP - shaft current and voltage protection relay. | ARCA Silver Medal 2017 for electromagnetic field monitoring system MEP. | ARCA Silver Medal 2018 for SafeHMI - safe humanmachine interface system. | ARCA Silver Medal 2019 for circuit breaker mechanism for single-pole operated GIS K8D.6-N 145 kV.



1. The Hybrid Box system for autonomous powering of GSM base stations was completed and delivered. The system is based on renewable energy sources (hydrogen, sun, wind). (2011)

- 2. Fifteen 1 MW wind turbines and one 2,5 MW generator unit were produced and installed at the location Pometeno Brdo in 2012. The Institute developed and delivered wind turbine and blade control systems, the process station and the monitoring system. In 2015, another 25 MW generator unit was installed and thus Pometeno Brdo wind farm reached the anticipated power of 20 MW.
- 3. The development project of SF6 insulated metalenclosed switchgear for 145 kV voltages was initiated in 2012. The mass of the plant, the quantity of SF6 gas and the dimensions of the new plant are significantly smaller compared to previous generations.
- 4. The first phase of Zakučac hydroelectric power plant revitalization was completed. It is the largest hydroelectric structure in Croatia with installed power of 486 MW. During the replacement and reconstruction process the Institute was in charge of transformer monitoring systems, generators, switching equipment and enclosed busbars, as well as of primary and secondary equipment quality control and monitoring. (2013)
- 5. The SCVP shaft current and voltage protection relay was developed. In the following years, it was delivered to numerous electric power facilities around the world. (2013)
- Toro 3 hydroelectric power plant in Costa Rica, for which the Institute delivered the generator unit monitoring system, was put in operation. (2013)
- Procurement contracts for 44 passenger trains were signed; the Institute delivered control, regulation, monitoring, protection, communication and visualization systems and provided support to KONČAR - Electronics and Informatics in the delivery of propulsion and auxiliary converters. (2014)
- 8. The bushing monitoring system BIM was developed. It provides a possibility to inspect bushings insulation while the transformer is in operation. (2014)
- 9. The European Commission notified KONČAR Electrical Engineering Institute Inc. as Notified Body under number NB 2494 for 7 directives. (2014)



#### Dalibor Filipović-Grčić, PhD

Member of the Managing Board 1. 1. 2021 - Present

Dr Filipović-Grčić has worked at the Institute since 2004 on high voltage testing and development of insulation systems for instrument transformers and transformer bushings. In addition to scientific work related to transformers, he has excelled in the export of laboratory services and takes the credit for introducing a number of special test methods.

He initiated the processes of expanding the accreditation area of the Laboratory Centre to include complete type examination of electrical equipment, such as conductors, MV and HV cables, insulators, capacitors, distribution transformers and chokes.

He was the head of High Voltage Laboratory, the manager of the Institute for Transformers, and in 2021 he became a member of the Institute Managing Board.

# **Brave Steps Ahead**



The Laboratory Centre (LC) was established and accredited in 2019 in response to global market requests and the need for a more efficient operation. The accreditation in accordance with HRN EN ISO/IEC 17025 standard confirmed that the LC was independent, competent and well-equipped to provide laboratory and field testing services. The LC offers customers around the world a "one-stop-testing" level of service.

The LC consists of eight laboratories accredited for more than 500 testing and measuring methods in accordance with international norms and technical specifications. It offers services in the following areas: HV and LV electrical equipment, material properties, environmental impact, electromagnetic compatibility, product safety, radio equipment, gas appliances, electromagnetic field sources, LV electrical installations and lightning protection systems, acoustics (noise) and physicochemical properties of materials.

The Institute laboratories are also used for applied research and as infrastructure for the Product Certification Service. According to the requirements of the standard HRN EN ISO/IEC 17065, the Service is an accredited body for conformity assessment of electrical engineering products.







The cooperation between the Institute and the scientific community has lasted since its establishment.

These are their joint activities:

- Partnership on joint scientific research projects resulting in scientific and professional papers
- Participation in the curriculum and joint organization of symposiums and conferences
- Mentorships, membership in professional commissions, boards and committees
- Continuing education of Institute's employees (graduate, postgraduate and specializations)
- Awarding the best students at three technical faculties
- Professional student practice, expert visits

Promoting cooperation with the scientific community directs activities towards scientific research areas that contribute to economic and social development, not only through education but also through applied research that fosters innovation.



 The Institute was a partner on the Horizon 2020 SafeLog project on research, development and production of a safety-critical vest prototype for workers in flexible logistic centres and on its safety certification. The project was successfully completed in 2020.

- 2. In 2016, the first energy converter for photovoltaic power plants KonSol-200 was delivered and installed in a photovoltaic power plant with a capacity of 1 MWp at the location of KONČAR - Power Transformers. The project for the PV power plant, which was put in operation in 2018, was developed and implemented by the Institute, which also delivered all the equipment.
- 3. Brežice hydroelectric power plant in Slovenia was put in operation in 2017. KONČAR produced, delivered and installed three generators with nominal power of 21,5 MVA, generator unit excitation and monitoring systems and auxiliary equipment. The monitoring systems were developed by the Institute.
- 4. The first electromagnetic field monitoring system (MEP) was delivered in 2018. By setting up the MEP system, Sveta Nedelja has become the first town in Croatia to provide its citizens with insight into the radiation levels of non-ionizing electromagnetic fields via the internet.
- 5. In 2018, KONČAR Electric Vehicles and Latvian Liepājas Tramvajs contracted the delivery of six low-floor trams. The first one was delivered in 2020. The Institute developed and delivered control, regulation, monitoring, protection, communication and visualization systems and supported KONČAR - Electronics and Informatics in the development and testing of propulsion and auxiliary converters.
- 6. The Institute has developed a two-channel control system for the KLC3 level crossing security system in accordance with CENELEC standards (SIL4), as part of the railway modernization and electrification project on the Zaprešić–Zabok section.
- 7. In 2020, a 12-meter HVDC conductor 500 kV, 4000 A was tested in a vertical position, inside an envelope, at an ambient temperature of 50°C. The test was ordered by a Swedish client. Large dimensions of the conductor and the complexity of the test make this method a unique one in the world.
- 8. A 3.5 MWp photovoltaic power plant on the island of Vis was put in operation in 2020, with a great contribution from the Institute which participated in the development, testing and delivery of KonSol-700 electronic power converters.
- 9. By 2020, 512 transformer monitoring systems were delivered. Since its first delivery in 2005, the TMS system has been delivered to 38 countries around the world.

# A Look into the Future



## LAVESP

In 60 years of R&D work dedicated to creating new and innovative products, equipment and services, the Institute has given a significant contribution in fields such as transformers, rotating machines, HV equipment, energy converters and rail vehicle components.

In addition, it successfully markets its own high-tech solutions based on ICT, such as monitoring systems for electrical equipment, control systems and built-in computer systems.

The Institute's role in Končar's corporate development will continue to be very important as it not only initiates new production programmes of the Group, but also assists in innovating the existing solutions.

The Institute's business strategy includes sustainable development and social responsibility principles, while forming and nurturing partnerships with all stakeholders and applying international standards for quality, environment and safety.

The key role of the Institute is to invest in the education of its associates, since the development of new complex products requires scientific research aimed at new technical and technological solutions.

Monitoring socio-economic changes and constantly adapting to new business conditions have been and will remain the main elements of our business stability. In the coming period, the Institute plans to expand its laboratory capacities and to strengthen its competencies in areas of interest to the Končar Group.



The basis of our sustainable business is research, development and innovations

# GENERAL DISCLOSURES

VULB #16

# **ORGANIZATIONAL PROFILE**

#### 102-1.3 Name of the organization, Location of headquarters

KONČAR – Electrical Engineering Institute, Ltd., with headquarters at Fallerovo šetalište 22, 10000 Zagreb, Croatia, operates in the areas of energy conversion and transmission, as well as use of electricity in power industry and transport.

It was founded on January 21, 1991 on market principles as an independent company within the KONČAR Group. It continued the work on core activities of the company Rade Končar - Elektrotehnički institut (founded in 1961): applied research and development of electrical equipment and plants.

#### <u>102-2</u> Activities, brands, products, and services

The main activities of the Institute are research, development and testing in the fields of natural, technical and technological sciences, with orientation towards applied research, testing and support to development projects of the Group. Besides supporting the Group in power industry and transport, the Institute offers its proprietary solutions and services in the global market.

#### Three key business activities



#### 102-5 Ownership and legal form

The Institute has the status of an autonomous company wholly-owned by KONČAR – Electrical Industry Inc., which leaves the Institute its entire profit for further development. Statement of Independence of June 6, 2000 attests its independence of any influence of its owner, manufacturers or suppliers of products, and that none of them can in any form influence test or certification results.

The Institute is registered in the Register of the Scientific Organisations of the Ministry of Science and Education. At the same time, being a company specialized in applied research in electrical and mechanical engineering, it has two important roles within the KONČAR Group:

- support to further development of solutions manufactured and sold by KONČAR companies based on contracts and market principles, providing expertise and R&D testing in numerous laboratories of the Institute,
- applied research at its own expense for the development of new solutions compatible to the production programme of the KONČAR Group, for which the Institute bears risks not only regarding the development but also regarding their placing on the market.

#### 102-6 Markets served

Major companies for the power systems area, telecommunications and transport are the Institute's long-time partners on the Croatian market. The most important customers on the world market are the global companies from Sweden, Republic of Korea, Switzerland, Pakistan, Qatar, Italy, Slovenia, Bulgaria and China.

Most important partners in R&D field are companies from KONČAR Group. Most important markets for diagnostics, testing and certification are the Croatian and EU ones.

# KONČAR Group 53%\_\_\_\_\_Croatia \_\_\_\_\_19%

#### Market segments 2021



#### 102-7 Scale of the organization

Sales per markets 2021

By its size and boundary indicators KONČAR – Electrical Engineering Institute Ltd. belongs to small and medium-sized enterprises according to the classification in the Accounting Act of Croatia.



#### 102-8 Information on employees and other workers

At the end of 2021, the Institute had 170 employees, i.e. 1 associates more than at the end of 2020. Among them, 133 have high or higher education, 82% belong to technical professions (electrical engineering 68%, mechanical engineering 10%, chemical 4%), economic and legal 7% and other professions 10%.

(on 31.12.2021)



#### Employees per age



#### **Employees by education level**



#### **Employment contracts**

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Temporary	5	3	8
Permanent	112	41	153
Trainees	4	1	5
With special rights, obligations and fees	3	1	4
Total	124	46	170

# Involvement of the Institute in the Implementation of UN Global Sustainable Development Goals (SDG)

UN adopted the 2030 Agenda for Sustainable Development to end poverty in the world, ensure quality education, healthy lives, decent jobs and address key environmental challenges. We have identified seven goals closely related to the Institute's business activities, whereby we can monitor our contribution to their implementation.



# We protect investments in property and primary equipment

We ensure better management of capital assets, safe and reliable risk management

#### Our contribution to SDGs 7, 8, 9, 11 and 12:



We are committed to the use of renewable sources and energy-efficient solutions. The Institute's contribution is related to water, sun and wind. We help modernize, monitor and diagnose vital equipment in hydro power plants, wind power plants and photovoltaic plants. We provide expert assistance in the construction of photovoltaic power plants and develop reliable vital components.



Our solutions improve resource management, reduce plant maintenance costs, and extend the lifespan of primary equipment.

By participating in R&D projects, we help build an adaptable infrastructure, promote inclusive and sustainable industrialization. and foster innovation.

Systems with functional safety requirements ensure the highest level of protection of people's lives and security of assets in work processes with a high potential risk.



Electromagnetic field monitoring system provides local communities with information about actual radiation values, thereby contributing to their safety.

Primary power equipment monitoring systems enable better management of vital components and risk management, thus contributing to a better quality of life for everyone.

We help manufacturers to have their products tested so that they can be marketed.

We assist manufacturers in assessing compliance of their products with regulations to determine their safety and reliability for the user and the environment.

Material topics: Economic performance, Indirect economic impacts

#### We protect the environment

By responsible management of natural resources and waste disposal in a safe and secure way we protect human health and minimize environmental impact

#### Our contribution to SDG 12:



We reduce the risks of premature obsolescence and product rejection through our own hardware and software platforms, helping to reduce emissions and accumulate unnecessary electronic waste.

Rational consumption of energy resources and the establishment of emission control systems in environmental constituents reduce the adverse effects to the smallest possible extent.

Material topics: Energy, Emissions of greenhouse gases, Waste

#### We protect people and the community

Our business activities reflect global needs and ambitions for solving complex technological challenges, protecting people and the community

#### Our contribution to SDGs 4, 5 and 8:



We encourage personal development and improvement of employees through professional education, foreign language learning, IT training and education for quality systems, environmental protection and occupational safety. By exchanging knowledge and partnership, both scientific community and the Institute acquire new competencies, creating new opportunities for development and value added in the wider community.



By accepting and encouraging diversity and equal opportunities, we contribute to both organizational culture and the general goals of non-discrimination and gender equality.



Solving complex industrial challenges and participation in international and national projects encourages employment on challenging tasks and creates new desirable jobs.

Healthy and secure working environment is recognized as our greatest responsibility and contribution to creating quality jobs.

Material topics: Training and education, Community, Diversity and equal opportunities, Employment, Health and safety at work

# **Research and development**

y	AND INFRASTRUCTURE

Applied and developmental research is focused not only on acquiring new knowledge, but also on solving advanced requirements on power equipment

 Study of voltage conditions in the isolation system of power transformers including those for high voltage direct current (HVDC)



- Research of new environmentally friendly insulation materials
- Investigation of power and instrument transformer failures





Development of a new break switch for laboratory usage

#### Electromagnetism

- Machine loss disposition calculations
- Specific purpose analyses
- Optimization of active machine parts



#### Heath transfer

- Machine temperature distribution analyses
- Computation of fluid dynamics (CFD)
- Optimization of heat transfer



#### Up-to-date

computation tools, simulation and physical models, and prototyping are all used to improve characteristics of standard and special purpose electrical machines

#### Mechanic

- Varying load vibration calculation
- Determination of material fatigue
- Stress analyses



Physical models

- Determination of precise characteristics
- Concept verification
- Prototype manufacturing



#### Systems with Functional Safety requirements



Systems with functional safety requirements ensure the highest level of protection of people's lives and security of assets in work processes with a high potential risk.

We are specialized in embedded control solutions according to the functional safety requirements for railways and machines.

The KONTRAC SafeHMI platform has acquired considerable references within level crossing and signaling systems, based on SIL (Safety Integrity Level) HW/SW components.







The Safety Vest System is a safety system for large-scale flexible warehouses that enables safe and efficient collaboration of humans and AGVs with heterogeneous skillsets - in the same area and at the same time.

The SVS provides a safety-related stop function for AGVs and logistics vehicles in an industrial work environment.

# **Proprietary monitoring and control systems**



Primary power equipment monitoring systems enable better management of vital components and risk management, thus contributing to a better quality of life for everyone

Features of monitoring systems:

- On-line systems
- Applicable to all kinds of primary equipment
- Modular and upgradable systems
- Long-term data storage and important events tracking (trends, waveform, alarms ...)
- Local and remote data access

# WE PROTECT INVESTMENTS IN PROPERTY AND PRIMARY EQUIPMENT

We ensure better management of capital assets, safe and reliable risk management



More than **700** On-Line Condition Monitoring System (OLCMS) delivered in **60** countries worldwide

#### TMSs MONITOR **>50.000 MVA** OF INSTALLED POWER

#### Transformer monitoring system – TMS

Končar TMS enables on-line monitoring and diagnostics of all vital parts of power transformers and reactors. It detects incipient faults, so that user can prevent failure by timely intervention.





# Systems for machine condition monitoring and fault detection – MCM

To ensure reliable operation of the Rotating electrical machines we have developed various condition monitoring systems, whose main function is early detection of possible defects and prevention of major material and financial losses.

**73 %** OF CAUSES OF MACHINE FAILURES CAN BE PREVENTED BY MCM

#### Electromagnetic field monitoring system – MEP



Electromagnetic field monitoring system provides local communities with information about actual radiation values, thereby contributing to their safety.

MEP is a system for continuous monitoring of electromagnetic fields radiation at all frequencies. It enables local communities insight in monitoring results, i.e. in the actual radiation values. In this way all the interested can compare actual radiation values with the levels defined in the Regulations for Protection against Electromagnetic Fields.



#### Train control and management system - TCMS



We reduce the risks of premature obsolescence and product rejection through our own hardware and software platforms, helping to reduce emissions and accumulate unnecessary electronic waste.

After successful development of embedded control systems for locomotives and trams, the Institute has developed and delivered train control and management systems for new Croatian electric and diesel trains.

The platform comprises numerous hardware and software components which enable configuration of different control systems for various purposes and of various levels of complexity.



7 CLEAN ENERGY

We are committed to the use of renewable sources and energy-efficient solutions. The Institute's contribution is related to water, sun and wind. We help modernize, monitor and diagnose vital equipment in hydro power plants, wind power plants and photovoltaic plants.

We provide expert assistance in the construction of photovoltaic power plants and develop reliable vital components.

Development of and proprietary solutions for control electronics and software for power converters.

The Institute developed the control electronics for the battery storage system to be installed in the photovoltaic power plant Vis.



Photovoltaic power plant Vis was put into operation with a large contribution from the Institute, which participated in the development and delivery of KonSol power converters. The solution enables parallel connection of several inverters and connection to the distribution network, which achieves functionality without an additional on-site substation and reduces energy conversion losses.



# **Diagnostics, testing and certification**



We help manufacturers to have their products tested so that they can be marketed.

#### Laboratory center accredited under EN ISO/IEC 17025



The Laboratory Center consists of eight laboratories accredited for numerous test methods according to the requirements of international standards and technical specifications. It is accredited to the requirements of EN ISO / IEC 17025: 2017, which confirms the independence and competence of providing laboratory and field product testing services.

Laboratory services are based on the competences of experts, quality, speed and the so-called "one-stop testing" approach.

# Laboratory testing services in the following areas:

- High-voltage and low-voltage power equipment
- Material properties
- Environmental impact
- Electromagnetic compatibility
- Electrical safety
- Radio equipment- Gas appliances
- Sources of electromagnetic fields
- Low-voltage electrical installations and lightning
   protection systems
- Acoustics (noise)
- Testing the physical-chemical properties of materials
- Calibration of measuring and test equipment

# Checking the condition of power equipment and systems

- Diagnostics of power and instrument transformers
- Diagnostics of switchgears in HV plants
- Diagnostics of rotating machines
- Acoustic diagnosis- Energy efficiency
- Quality of electricity
- Measurements of NF and HF fields
- Non-destructive testing (NDT)



# Notified body and product certification body (SCERT) accredited under EN ISO/IEC 17065



We assist manufacturers in assessing compliance of their products with regulations to determine their safety and reliability for the user and the environment.

KONČAR – Electrical Engineering Institute, as a Notified Body (NB), assists manufacturers in conformity assessment and certification of their products in accordance with European standards and directives, before CE marking and placing on EU market.

# KONČAR – Institute is a Notified Body NB 2494 of the European Commission for the following regulations:

- electromagnetic compatibility (Directive 2014/30/EU)
- noise emission in the environment by equipment for use outdoors (Directive 2000/14/EC)
- gas appliances (Regulation (EU) 2016/426)
- radio equipment (Directive 2014/53/EU)
- welding procedures of pressure equipment (Directive 2014/68/EC)

In addition to conformity assessment as a Notified Body, the Institute assesses product conformity as an authorized/accredited Certification Body (SCERT) for products and processes in the areas of LV and HV equipment, corrosion or IP/IK protection, ecological design, energy labelling, welding procedures for metal materials, and signaling and traffic regulation equipment. It is also equipped for assessment of product conformity to climatic conditions and noise and vibrations.

Accredited certification schemes of Institute enable conformity assessments and certification of products intended for markets other than EU that are made in accordance with ISO and IEC standards or manufacturer specifications.



#### Product conformity assessment

Well-equipped laboratories and a wide range of accreditations, authorisations and notifications of the Institute enable numerous and diverse services:

- Type testing of products in our test laboratories
- Verification of test reports issued by other laboratories
- Expert supervision of tests in external laboratories
- Assessment of completeness of technical documentation
- Conformity assessment of technical documentation
- Assessment of product design
- Type examination of products for certification purposes
- Certification
- Auditing compliance with the type of product

#### Certification (SCERT) and Inspection Bodies

Product Certification Body – SCERT is an independent unit within the Institute that impartially certifies products.

Inspection Body impartially inspects and calibrates power and measuring equipment used in testing electrical installations.



#### 102-9 Supply chain

Business activities of the Institute are based on a wide scope of suppliers and business partners mostly from electrical industry, but also from numerous other fields. Code of Business Ethics is the basis on which the Institute develops its relations with suppliers, business partners and all the stakeholders. Partners in the supply chain, apart from required quality, should also observe the best of human rights and working conditions, occupational health and safety, and environmental and ethical concerns.

Because of very stringent requirements on products and services, the purchasing processes in the Institute are mostly based on agreements and contractual arrangements oriented towards quality, competitive prices, respect and integrity. Choice of suppliers is based on their professionalism and competence, and the purchasing process and choice of suppliers are implemented in an objective and transparent way.

Suppliers are selected according to the following criteria:

- technical and functional characteristics and capabilities
- proofs of quality assurance (certificates, test reports ...), instructions
- delivery time and mode of transport
- reaction speed and cooperativeness
- price and payment terms.

Providers of outsourced services are selected according to their technical capabilities and competences (references, cooperation so far). If necessary, periodic audits of suppliers are carried out to check their competencies and ensure the continuous quality of their services.

Suppliers are evaluated and approved by the laboratories. At least once a year, suppliers are re-evaluated on the basis of the same criteria and quality of their deliveries to ensure quality of the tests.

When evaluating suppliers, numeric and statistical methods can be used (e.g. grading from 1 to 5 for each criterion). This kind of assessment is recommended if there is a problem and if the supplier should improve the service or the product. In that case, the supplier is informed about the grade and need to improve.

A supplier is removed from the list if he does not meet the criteria to such an extent that it may jeopardize the quality of the work for which his service or product is intended, in particular if it could jeopardize the quality of the test or calibration or affect the customer's satisfaction.

#### 102-10 Significant changes to the organization and its supply chain

#### New Managing Board appointed and the reorganization of the Institute

Since January 1, 2021 the Institute has a new Managing Board consisting of the President and Board Member. The Institute has also been reorganized to optimize the potentials and competences of employees. The former six departments are now reorganized into three business units: Power Equipment, Digital Platforms and Systems, and the Laboratory Center (LC).

#### 2020+ Integral Strategy and the implementation of the new operational model of the KONČAR Group

In 2021 the Group adopted the 2020+ Integral Strategy for the KONČAR Group, which defines the main development directions and openness to new technologies and business models. The Institute, as well as other Group companies, are expected to strengthen and develop strategic competencies, expand the product and service portfolio, increase revenue, and effectively manage profitability. Due to its core business of research and development, the Institute had a significant role in the shaping of the strategy.

#### Institute restructuring

The Institute was restructured from a joint stock company to a limited liability company in November 2021 to help implement the Integral Strategy and the new operational model.

#### Reconstruction of the administrative building envelope and the fire escape stairway

The reconstruction of the administrative building (P-building) envelope and the fire escape stairway was completed in 2021, enhancing the safety of employees, building comfort and energy efficiency with the expectation of reduction in heating and cooling cost.

#### LAVESP construction start

The construction work on the new LAVESP – Laboratory for Power Systems and Drives building started in July 2021, with KONČAR - Engineering as the main developer. The new LAVESP building is very important for the continuity and development of HV equipment testing, and its specifications equal those of the world's renowned laboratories.

#### 102-11 Precautionary Principle or approach

Through commitment to sustainable development strategy, the Institute is guided in its business processes by Precautionary Principle in accordance with Act on Environmental Protection and its actual capabilities. Precautionary Principle means that in case when scientific and objective evaluation indicates that there is a possible environmental or health risk, measures for its prevention are implemented although the damage is not fully certain.

#### 102-12 External initiatives

#### UN Global Compact principles

As a member of the KONČAR Group, the Institute participates in the United Nations Global Compact initiative for corporate social responsibility.

As one of the signers of the UN Global Compact, KONČAR has been actively supporting and promoting the UN GC 10 principles since 2007. This document also communicates the Institute's progress for UN GC and its active measures for the advancement of human rights, employment, corporate governance, environmental protection and fair business practices.

#### **Diversity Charter**

The Diversity Charter is a voluntary initiative launched in 16 EU countries and joined by the Institute to promote the principles of diversity and non-discrimination in the workplace. The Diversity Charter Croatia was developed as part of a joint project of the Croatian Business Council for Sustainable Development (HR PSOR) with partners from Slovenia and Romania.



#### Principles of corporate management

As a part of KONČAR Group, the Institute supports the principles of corporate management adopted by the Management and Supervisory Boards of KONČAR – Electrical Industry on 22 December 2020 concerning:

- Socially responsible management,
- Defining a procedure of corporate management based on recognizable adopted international standards, and
- Supervision of business activities

to establish high standards of corporate management and business transparency as the basis for protection of shareholders, investors and other stakeholders, and for care for workers, sustainable development and environmental protection.

#### Integrated management system

The market competence of the Institute and its recognisability in social community are based on the Integrated Management System which covers quality management system (ISO 9001), environmental management system (ISO 14001), occupational health and safety management system (ISO 45001), system for management of testing and calibration laboratories (EN ISO/IEC 17025), and system for management of certification bodies (EN ISO/IEC 17065).

Integrated management system enables the Institute to apply principles of corporate social responsibility with balanced relation to customers, employees, owners, suppliers and social community. It defines roles and responsibilities, organization and processes that are important for achievement of high level of quality of our products and services. Through such processes the Institute communicates with customers and other stakeholders, realizes products, achieves goals, learns, and makes continual improvements.

#### • ISO 9001

Quality management system (QMS) – focused on processes to meet stakeholder expectations and ensure permanent improvement

#### ISO 14001

Environmental management system (EMS) – focused on environmentally friendly activities and products with a view to improving positive environmental impact

#### • ISO 45001

Occupational health and safety management system (OHSMS) – health and safety at work ensures a safe and healthy work environment for creating reliable and efficient technical solutions



#### <u>102-13</u> Membership in associations

- Croatian Academy of Engineering (HATZ)
- Croatian Business Council for Sustainable Development (HR PSOR)
- Croatian Chamber of Economy (HGK)
- Croatian Chamber of Electrical Engineers (HKIE)
- Croatian Chamber of Mechanical Engineers (HKIS)
- Croatian Exporters Association (HIZ)
- Croatian Laboratories (CROLAB)
- Croatian National Committee of the International

ISO/IEC 17025

Competence of testing and calibration laboratories General requirements for the qualification of test and calibration laboratories carrying out tests or calibrations. The results obtained are shown in test reports or calibration certificates.



## ISO/IEC 17065 / ISO/IEC 17020 Compotence of contification and

Competence of certification and inspection bodies

General requirements for the training, impartiality and consistency of the body carrying out the certification of the product.



General requirements for the competence of the body conducting the inspection and for impartiality and consistency in the conduct of inspection work

• Nuclear safety requirements for product and service providers classified as Safety Related (SR)

Council on Large Electric Systems (HRO CIGRÉ)

- Croatian Standards Institute (HZN)
- Electrotechnical Society Zagreb (EDZ)
- European Committee for Electrotechnical Standardization (CENELEC)
- International Conference on Electricity Distribution (CIRED)
- International Council on Large Electric Systems (CIGRÉ)

#### The Institute is a member of Croatian Business Council for Sustainable Development since 2010



#### <u>102-15</u> Key impacts, risks, and opportunities

#### The risk of spreading the SARS-CoV-2 virus

In 2021, as well as in the previous year, employee awareness and health protection due to the risk of spreading the SARS-CoV-2 virus was a top priority. We promoted COVID-19 vaccination among employees and organized mass vaccination on three KONČAR plant locations four times during the year. Around 1,500 employees of the KONČAR Group answered the call for vaccination during 2021.

The coordination team monitored the situation daily and instructed employees on health protection through the Institute's intranet. Employees with jobs that allow it were empowered to work from home, and shift work was introduced. The circulation of people was reduced by using communication platforms instead of live meetings, and special attention was paid to the protection of risk groups and pregnant employees.

#### Market risk

The Institute manages the economic effect of its business policy based on the diversification of market risk. Of the three core businesses, some always bring higher revenues than others due to market conditions and contracts. The Institute is constantly trying to develop new products and services in order to compensate one reduced activity with another.

#### Interest rate, credit and liquidity risks

The Institute is funded exclusively by its own resources and is not exposed to interest rate, credit and liquidity risks.

#### Currency risk

The company is exposed to currency risks, i.e. changes in foreign exchange rates when purchasing equipment and parts for its own products, but this risk is minimized by doing business with suppliers mainly in EUR, and avoiding currencies as CHF i USD.

#### Technological-development risk

Personal development and improvement of employees are very important for the Institute, because business activities and development are based on the application of knowledge, i.e. on good knowledge of problems and ways of solving by applying new techniques and technologies. With additional training, active participation in international conferences and exhibitions employees gain specialist knowledge and make innovations that create a competitive edge and contribute to the success of developing new products and services.

#### Personnel risk

The risk of key employees leaving the company and competencies retention were recognized as main priorities of the Institute in 2021. We have been working on preventing unwanted employee turnover and improving the organizational climate and employee satisfaction. Employees are given the opportunity for professional development, foreign language learning, IT training and education for quality systems, environmental protection and work safety. New competencies are gained through postgraduate doctoral and specialist studies, and creativity and leadership development are encouraged through management education programs.

## STRATEGY

# MISSION

Through application of knowledge and state-of-the-art technologies we develop solutions for efficient energy conversion and power transmission, on the principles of Corporate Social Responsibility.

To become a globally recognizable partner in the fields of power engineering and rail vehicles, and in that way to contribute to the success of KONČAR Group.

#### VISION

#### Policy of governance and social responsibility

The policy of governance and social responsibility expresses the unambiguous orientation of the Managing Board to the application of a management system based on the principles of sustainable development and social responsibility and the permanent improvement of the system

#### Strategy of Sustainable Development of the Institute

- Permanent increase of productivity with intense investments in the development of new products and services, life-long learning of employees, and construction of new laboratories or upgrading the existing ones
- Business based on sustainable development, fostering and promoting partnership relations with all stakeholders
- Fostering collaboration with academic communities and public institutes through joint scientific-research projects
- To be a scientific organization with status of an independent company within the KONČAR Group, whose owner leaves its entire profit for its further development.

# **ETHICS AND INTEGRITY**

#### 102-16 Values, principles, standards, and norms of behaviour

Within its sphere of influence the Institute supports and implements all the measures and obligations prescribed by law and international standards for the areas of business ethics, workers' rights, occupational health and safety and environmental protection.

#### Our fundamental values

Our values reflect our goals, priorities and convictions that guide us. By adhering to fundamental values and ethical standards we can focus on sustainability.

#### Reliability

One of our fundamental values, inherent to all we do. It is ensured by building trust with our customers based on our correct expertise and up-to-date technical solutions.

#### Excellence

Our goal is to constantly make improvements, plan future activities, and forecast challenges, keeping excellence, quality and sustainability.

#### Tradition

Decades of experience in applied research and laboratory testing are the basis for stability and success of our business in the future. There are intense investments in the development of new products and services, training of employees, and construction of new laboratories and refurbishment of the existing ones.

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May 3, 2022 KONČAR - Electrical Engineering Institute Ltd. Managing Board

#### Knowledge

Successful business is based on knowledge and skills of our employees, superior expertise, professional competence, and correct and impartial assessments.

#### Responsibility

We are aware of social and environmental impacts of our actions. We take greatest possible care of environmental protection, human rights and occupational health and safety.

#### Code of business ethics

The Institute is a signatory of the CODE OF BUSINESS ETHICS of the Croatian Chamber of Economy.

In our business practice, we follow the highest ethical standards, and build our reputation on expertise, trust and reliability. All employees are encouraged to follow the Code in their work and everyday activities, and the Code covers rules and procedures, guidelines for decision making and examples of potential ethical dilemmas related to business activities.



Pursuant to the Law on the Protection of Reporters of Irregularities, the Institute's management adopted the final text of the Ordinance on the Procedure for Internal Reporting of Irregularities and the Appointment of a Confidential Person which regulates; the procedure and method for appointing the reporter, the procedure and method for appointing a confidential person, the protection of the reporter of irregularities and the preservation of the received data and other important issues for reporting and protection of the reporter of irregularities.

The Institute has no recorded cases of irregularities.

#### Anti-corruption policy

Anti-corruption policy of the Institute is implemented by doing the entire business in accordance with laws, international regulations and rules of profession in an honest, fair and ethical way, with zero tolerance to bribery and corruption. The policy defines the reporting procedure, and every employee shall report any knowledge or doubt of bribery or any form of corruption inside or outside the Institute to the head of their business units or service. Employees can report their knowledge or observations either orally, by mail or by an anonymous note put in a special box.

No case of corruption has ever been noticed in the Institute.

# GOVERNANCE

#### 102-18 Governance structure

KONČAR – Electrical Engineering Institute is a research, development, and services limited liability company fully owned by KONČAR – Electrical Industry Inc. (Parent Company). Companies within the KONČAR Group are independent legal entities.

#### Managing Board

The Managing Board of the company consists of one to up to three members. All Managing Board members are equal in position and status, while the Managing Board President coordinates the entire Board. The Managing Board is appointed and dismissed by the Assembly. The Assembly also decides on the number of Board members and their term, which cannot be longer than 4 years.

The Managing Board manages the business of the company in accordance to laws, the Articles of Incorporation and the Rules of Procedure. The Board is mandated to protect the company interest, which includes the interest of company members, its employees and public interest.

For some decisions previous agreement of the Assembly is required, as described in the Articles of Incorporation.

#### **Coordination Board**

The mandate of the Coordination Board is to supervise the business of the company and approve the decisions of the Assembly. The Coordination Board consists of three members appointed by the Managing Board of KONČAR – Electrical Industry Inc.

#### Assembly

The company Assembly consists of the only company member. The Assembly decides on financial reports, appointment and dismissal of Board members, and other issues pursuant to the Companies Act and the Articles of Incorporation.

The Assembly meets at least once a year and promptly upon determination that the company is operating with a loss.



#### Organizational structure

The basic organizational structure of the Institute is set down by the Managing Board and approved by the Assembly.

From 1st January 2021, the Institute operates according to the new organizational structure which enables an efficient way of adapting to market requirements and investing its own resources in new technologies and applied research for the purpose of developing new solutions and services. The results of this approach are the trust of employees and customers and the creation of competitive products whose features and quality meet customers' needs.

Business units of key competencies act as profit centers, whose effectiveness is measured by newly created value and is the basis for receiving employees from the joint contribution of the unit, while the success of individuals or teams is rewarded by personal stimulation or one-time monetary reward, depending on the contribution to the operation of the Institute or creation of conditions for future successful business operations. Business activities of the Institute are carried out in business units with the support of joint services, so that rewarding the services is related to the joint success of three profit centers.

Within the Institute there is the independent, accredited Certification and Inspection Body. The work of Product Certification Service - SCERT is supervised by representatives of government bodies and consumer associations. Certification Service - SCERT is accredited under EN ISO/IEC 17065:2012 Conformity assessment – Requirements for bodies certifying products, processes and services, and the Inspection Service for Power and Measurement Equipment under EN ISO/IEC 1700:2012.

#### **Organisational chart**



# **STAKEHOLDER ENGAGEMENT**

#### <u>102-40</u> List of stakeholder groups

The nine key stakeholders of the Institute have been identified. Stakeholders, their needs and expectations, and the type and frequency of communication are presented in the table.

Stakeholders	Stakeholder needs and expectations	Type and frequency of communication
CUSTOMERS	Quality of products and services Observing delivery times Customer relationship management and methods of complaint solving Responsible resource management Ethical principles Customer privacy	Regular meetings, workshops, consultations Professional training when necessary Solving and analysis of complaints, requests and suggestions, when necessary Annual customer satisfaction survey Fairs, conferences, gatherings Official website, e-mail (continuous) Annual visits to customers Annual Sustainability Report
EMPLOYEES	Salaries and allowances Good working environment Personal development, respect and rewarding Stabile business Occupational health and safety Training and education Non-discrimination	Annual employee satisfaction survey Training and education, continuous Intranet, continuous E-mail, continuous Annual Sustainability Report
SHAREHOLDERS AND INVESTORS	Corporate business strategy Value added Sustainable business	Annual general meeting Letters, e-mail, when necessary Annual Sustainability Report
SUPPLIERS AND PARTNERS	Mutual benefits and long-term relations Management systems Ethical behaviour	Participation at conferences Mutual annual audits Official webpage, continuous Annual Sustainability Report
LABOUR COUNCIL	Participation in management Legal compliance Freedom of association and right to collective bargaining	Regular and extraordinary meetings Notice boards, continuous Annual Sustainability Report
BUSINESS AND PROFESSIONAL ASSOCIATIONS	Financial support Strengthening competences	Membership, continuous Working groups, working bodies, continuous Participation at conferences Annual Sustainability Report
SCIENTIFIC COMMUNITY	Applied R&D Transfer of knowledge Joint projects	Scientific and professional papers Seminars and workshops, when necessary Participation at conferences and gatherings Joint activities Annual Sustainability Report
PUBLIC ADMINISTRATION BODIES	Paying taxes, contribution and charges Compliance with laws and regulations Reporting	Working groups, continuous Letters, e-mail, continuous Official webpage, continuous Annual Sustainability Report
LOCAL COMMUNITY	Investments in local initiatives Protection and rational use of resources (economic, environmental and social)	Regular visits and joint activities Donations and sponsorships Official webpage, continuous Annual Sustainability Report

#### 102-41 Collective bargaining agreements

Rights defined in Collective Agreement are guaranteed to all the employees.

#### 102-42 Identifying and selecting stakeholders

Internal procedures were established for recognition of particular stakeholders with which business units and services mostly interact in their everyday activities, stakeholders' requirements, frequency of interaction, way of communication, and relevance of stakeholders in regard to Institute's sustainable development.

The recognition process has three steps:

- 1. Identification of key stakeholders
- 2. Mapping stakeholders according to business impacts
- 3. Determination of stakeholder expectations and ways of communication

#### Communication with stakeholders

Due to limited movement and inability of direct contact in 2021, communication via websites and social networks has assumed the dominant role. Digital marketing and sales activities were dominant in 2021 and the means of communication and inclusion were as follows:

#### Fairs and conferences

The appearance and participation of the Institute's associates in 8 international fairs and professional gatherings in synergy with KONČAR Group companies was planned for 2021. Due to the pandemic, most events have been postponed or were held online, while 24 papers (scientific, expert or reports) of the Institute's associates have been published in various publications.

#### Official webpages

The Institute's webpages are constantly upgraded and harmonized with new requirements, offering information on business activities, organization of the Institute, solutions and services, references and a multitude of useful data related to electrical engineering, mechanical engineering, electronics and other technical sciences. The first page was published in 1996 at www.koncar-institut.hr. In 2017 it was redesigned to enhance its technical aspects as well as the user interface. In 2016 a dedicated website was created at www.koncarmonitoring.com, for the promotion of products and services of monitoring and diagnostics of transformers and rotating machines.

#### Social networks

In order to increase its virtual presence and enhance communication with stakeholders, the Institute uses LinkedIn, the world's largest business network, to publish business related information, information on new projects, products and services, as well as to announce its participation in trade fairs and conferences. The KONČAR – Electrical Engineering Institute LinkedIn page (https://www.linkedin.com/company/koncar-electrical-engineering-institute-inc./) has over 8,100 followers with about five new posts published every month. In 2019 the Laboratory Center I KONČAR – Electrical Engineering Institute showcase page went live with information on services, business, and projects of the Laboratory Center (https://www.linkedin.com/showcase/laboratory-center/).

#### Intranet

The Institute's intranet is the central information point for employees with instructions and forms necessary for everyday work, databases of professional knowledge and norms, ordinances and other acts. The platform also contains interesting business events, as well as events related to employees, the introduction of new employees and awards and provides an overview of published scientific and professional papers of associates. Information and file management, archiving and searching, joint teamwork and creation of knowledge databases are ensured by MS Office SharePoint Server - MOSS document management system.

#### Employee satisfaction survey

A survey of KONČAR Group employees was conducted in 2021 to further the understanding of employee satisfaction and opinion towards specific aspects of employment and management, their openness to different types of collaboration and the mobility within the Group, as well as to determine the areas in need of improvement.

According to the survey, the employees are the most satisfied with their coworkers, status within the organization and work conditions. They are the least satisfied with their salaries and recognition, organization management and promotion opportunities.

When it comes to mobility within the Group, the employees are the most interested in joint Group projects within their regular work and believe they would have company support for such projects.

Employees stated that their managers pay more attention to failures and mistakes. A need for improvement on the management level has been noted, primarily in terms of more active management, recognition and intellectual stimulation and motivation of employees under their management.

#### 102-43 Approach to stakeholder engagement

The procedure refers to the collection, storage and processing of stakeholder requirements related to their satisfaction and expectations related to the information on Institute's impacts as well as to the information provided in the previous report.

The content of the report includes all the expectations, expectations and satisfaction ratings related to the topics of sustainable development, which were received from the involved stakeholders during the reporting period.

Involved stakeholders: employees, shareholders, customers, suppliers and partners, scientific community.

#### <u>102-44</u> Key topics and concerns raised

In the reporting period, the following stakeholders' demands and interests were initiated as key and material:

- key economic indicators, investment in development (employees, customers, shareholders) GRI 201 Economic Impact
- the interest of suppliers and partners in the relationship between the Institute and the environment, and the
  establishment of a complete emission management system in the environmental constituents (shareholders, suppliers
  and partners, employees) have fuelled the materiality of the environmental themes GRI 302 Energy, GRI 305
  Emissions and GRI 306 Waste
- requests for promotion of connections between science and economy (partners) GRI 406 Community

# **REPORTING PRACTICE**

#### <u>102-46</u> Defining report content and topic boundaries

In order to focus on the most important issues of sustainability for our stakeholders and our business, we apply the GRI principle of materiality. In 2016, the first process of identifying the most important material issues of sustainability in 5 steps was carried out: identifying, prioritizing issues, stakeholder involvement, analysis of relevance for the reporting period and confirmation.

Harmonizing the business activities of the Institute with expectations and needs of stakeholders, the following issues of particular interest are identified:

- stable and sustainable economic growth (employees, shareholders, suppliers and partners)
- investment in development and value added (shareholders, suppliers and partners, scientific community)
- responsible energy consumption and environmental impacts (employees, shareholders, customers)
- fair employment and job creation (employees, shareholders, scientific community)
- investing in competence and expertise (employees, customers)
- transfer of knowledge and innovation (buyers, scientific community)

The Institute is influenced by its own activities, but also by the activities that are the result of business relationships with other organizations.

#### 102-47 List of material topics

#### Economic

- Economic performance
- Indirect economic impact
- Environmental
- Energy
- Emissions
- Waste

- Social
- Employment
- Occupational health and safety
- Training and education
- Diversity and Equal Opportunity
- Communities

#### 102-48 Restatements of information

None.

#### 102-49 Changes in reporting

There were no changes in material topics compared to the previous report. All inquiries and requests from stakeholders in the reporting period were already included in the content. Each year material topics shall be reviewed in terms of importance and harmonized with the requests and feedback received from the stakeholders involved. Each material topic has been accompanied by announcements of management approaches.

This report integrates the involvement of the Institute's business activities in the achievement of Agenda 2030 of the UN Global Sustainable Development Goals.

- 102-50 This 15th Report covers the period from 1 January to 31 December 2021.
- 102-51 The previous report was published in May 2021, and the next is planned for April 2023.
- <u>102-52</u> Sustainability Reports are published annually, and each contains results from the previous calendar year.
- <u>102-53</u> Contact person for Sustainability Report and its content: Irena Šinko, Expert Assistant for CSR and Communication, isinko@koncar-institut.hr.
- 102-54 This Sustainability Report for 2021 has been prepared in accordance with GRI standards: Core option. We also use other recognized reporting frameworks, such as the UN Global Compact principles and the 2030 Sustainable Development Goals.

#### 102-56 External assurance

External assurance of the Report was not made.



We observe highest principles of professional ethics and good business practices

# TOPIC-SPECIFIC DISCLOSURES

# ECONOMIC

#### <u>GRI 201</u>

## Economic performance



Our solutions improve resource management, reduce plant maintenance costs, and extend the lifespan of primary equipment.

#### GRI 103 MANAGEMENT APPROACH

#### 103-1 Explanation of the material topic and its Boundary

The Institute's economic growth is based on cutting-edge R & D services, competent and well-equipped laboratories, and competitive advanced IT-based solutions. It also plays an important role in the development of key electronic and energy components and communication equipment of Končar's production program.

The topic is material due to the significant interest of the involved stakeholders - employees, customers, shareholders and partners and the Institute.

The company is influenced by its own activities, but also by the activities that are the result of business relations with other Končar Group companies and the situation in the Croatian and global markets.

#### 103-2 The management approach and its components

The Institute participates in research, development, testing, supervision and expertise on a large number of Končar Group projects. In addition to providing support to Končar Group companies, the Institute's experts cooperate globally in the development of rotating machines and security critical embedded computing systems for a foreign customer.

The export potential for the global market are also transformer, bushing and machine monitoring systems and laboratory testing.

It is also investing in the reconstruction of the existing and construction of new laboratory infrastructure. The modernization of laboratory infrastructure is a prerequisite for improving the testing and the market position of the Institute. The strategy of providing laboratory services is based on competences, quality, speed and the so-called "one-stop testing" approach.

#### 103-3 Evaluation of the management approach

The Institute's short-term assets are 4.4 times higher than short-term liabilities, and in short-term assets 65% include financial assets and cash that, together with open liabilities, after the end of the business year, ensure stable operations of the Institute in the forthcoming period.

#### 201-1 Direct economic value generated and distributed

Despite the restrictions, 2021 resulted in much better business outcomes compared to previous years and annual plans. Export revenues increased by 66 percent, sales revenues within the KONČAR Group by 28 percent, while sales to other companies on the Croatian market decreased by 10 percent. Laboratory HV equipment testing, transformer and conductor monitoring systems, rotating machine monitoring systems and development services for security critical embedded computing systems were the most important export products and services.

Component	2021
Direct economic value generated	12.32
Sales	11.98
Financial income	0.01
Asset income (rental and sales)	0.04
Income from co-financed projects	0.17
Direct economic value distributed	10.56
Suppliers of materials and services	4.31
Education & training	0.06
Services of academic community	0.05
Other costs	0.17
Salaries & allowances	3.76
Taxes, contributions, insurances	2.20
Donations	0.01
Retained earnings	1.75

(mil. €.)

When it comes to key activities in 2021, revenue from proprietary solutions increased by 56%, from diagnostics, testing and certification by 15%, and revenue from research and development by 7% compared to 2020. The following figure shows sales revenue for key business activities for the past five years.

The Institute's long-term business strategy in the coming period will be focused on excellent research and development services, competent and well-equipped laboratories and competitive advanced products based on information communication technologies.

Challenges in the coming period will be the construction of a new Laboratory for Power Systems and Drives (LAVESP), the continuation of investments in infrastructure for laboratory and diagnostic tests, and other projects to modernize laboratory equipment. It is planned to continue the investment in competencies within the Certification Service and the Service for Electrical and Measurement Equipment Inspection. These services, together with the Institute's certification for 5 EU directives (Notified Body 2494), further increase the Institute's visibility on the market for laboratory, diagnostic, certification and inspection services. Sales per business activities



#### Key business indicators

Productivity measured by value added per employee in 2021 was  $\in$  43,632, which is a 25% increase compared to 2020. In 2021, operating income was 12.47 million  $\in$ , while EBITDA amounted to 2.18 mill.  $\in$ . In the last 5 years, the average annual sales revenue growth was 5.1%.



#### **Operating income; EBITDA**

Sales revenue; AAGR\*



#### Trends in total income, sales, value added, total personnel cost, and number of employees

Trends in total income, sales, value added, total personnel cost, and number of employees in the last 5 years are shown below.





#### Investment in the development

Investments in non-current assets amounted to 2.87 mill. € - 1.95 mill. euros in the construction of the new LAVESP project lab, 349,540 euros in the reconstruction of the Pbuilding envelope, 419.979 euros in equipment, and 143,537 euros in software and development. Investment maintenance of equipment and buildings amounted to 190,054 euros. Investments in education with total eligible costs (tuition fees, registration fees, professional literature and official trips related to training) amounted to 65,123 euros. The license and maintenance cost of the software was 178,092 euros.

#### Investments in R & D

Numerous projects are underway where the Institute conducts co-financed R & D and innovation activities or invests exclusively in its own resources. In 2021, R & D invested a total of 0.69 mill.  $\in$ .

#### Major investments realized in 2021:

- P-building envelope reconstruction
- Software licenses for the Digital Factory Lab (DFL) initiatives
- Software licenses for the 61850 protocol implementation
- Software to expand the capabilities of HF measurement equipment (5G)
- Walk-in climatic chamber

#### Investments

					(mil. €)
	2017	2018	2019	2020	2021
Investments in equipment & refurbishments	0.82	0.66	0.57	0.50	2.87
Investment maintenance	0.08	0.08	0.08	0.07	0.19
Software license and maintenance	0.13	0.27	0.20	0.15	0.18
Investments in R&D	0.13	1.29	1.03	0.99	0.69
Education	0.97	0.12	0.12	0.06	0.06



- Accelerated ageing chamber
- Rotating machine diagnostic equipment
- Automatic tensiometer
- Thermal imaging camera
- Laboratory regulated source
- Oscilloscopes and measuring equipment

#### Increase of laboratory capacities by our own investment

The construction work on the new multipurpose building LAVESP – Laboratory for Power Systems and Drives started in July 2021. This is the Institute's largest and the most important investment since 1971 with an estimated value of 7.55 mill.  $\in$ .

LAVESP is very important for the continuity and development of HV equipment testing, and its specifications equal those of renowned laboratories around the world. Apart from HV measurements, the laboratory will conduct other electrical, mechanical and climate testing.

A HV laboratory, 30 x 35 m in floor size and 28 m in height, completely enclosed in a Faraday cage, will be the heart of the building. The space will accommodate three main newly acquired testing systems – a 1200 kV AC source, a 1200 kV DC source and a 3.8 MV surge generator. The 1200 kV, 960 kVA testing transformer is a single step, and not the usual cascade design, which will be developed and supplied by KONČAR – Instrument Transformers. This is just one of the special features of the new laboratory.

The Institute registered the project to expand its R&D and testing capabilities with the Ministry of Economy and Sustainable Development to apply for an investment grant. Testing equipment delivery and commissioning are planned for Q3 2022, while LAVESP is planned to start operations in Q4 2022.

#### 201-2 Climate change: financial implications, risks and opportunities

Climate change is the main topic of discussion in almost all international organizations, governments and large and small companies around the world. The Institute is not an exception and has been encouraging and implementing measures to reduce greenhouse gas emissions for many years. Through its policy of governance and social responsibility the Institute undertook to maintain high standards of environmental protection and health and safety in all business processes.

Although the Institute develops its business in the field of services with less significant consequences for the environment, employees of the Institute pay great attention to environmental protection in two ways. One is to launch a range of initiatives to mitigate climate change within the Institute, monitor the consumption of heat and electricity, as well as water in order to rationalize self-consumption while at the same time regulating the working environment and facilities. The second way is through new technical solutions of products with minimal environmental impact and suitability for recycling at the end of their lifetime. Observing the whole product lifecycle is one of the important elements that gives the future product user-added value, the meaning of which is increasing every day.

In the forthcoming period, the Institute plans to restore the envelope of the administrative building in order to further reduce the consumption of heat and electricity and to build a new facility according to the principles of high energy efficiency in which the LAVESP laboratory will be housed.

Most of the Institute's facilities were either reconstructed or they are currently undergoing reconstruction in accordance with the energy efficiency rules of buildings in order to reduce heating and cooling costs. Such access to natural resources significantly contributes to the reduction of costs related to the Institute's infrastructure, which is very large and demanding in terms of space and installations and without which the Institute could not perform very complex research and testing.

#### 201-3 Defined benefit plan obligations and other retirement plans

In the preparation of the annual financial statements for the year 2021, provisions for jubilee awards and severance payments amounting to 0.21 million euros were made. The amount includes the estimated amount of regular employee benefits in accordance with the Collective Agreement. The present value of the provision is calculated on the basis of the number of employees, the amount of the pension, the working life on the balance sheet date and the discount rate of 0.6%. The reserve amount fully covers the anticipated severance grants and rewards of employees who have been eligible for this in 2021.

The companies of the KONČAR Group regularly pay contributions for all workers in the system of generational solidarity at the rate of 20% for the 1st pension insurance pillar. For insured persons who are insured in both mandatory pillars, the contribution rate for the 1st pillar is 15%, and for the 2nd pension pillar the contribution of 5% is paid to personal accounts in mandatory pension funds.

Employees can elect to contribute to the voluntary 3rd pillar pension fund. If they elect one of the pension funds, the employer withholds the voluntary pension insurance from their gross salaries up to a maximum tax-free amount of 66.45 euros monthly or a total of 797.4 euros annually.

#### Financial assistance received from government

In 2021, the Institute received the state aid in the amount of 45,231 euros through the reduction of the profit tax base (education and training grants) and the 100% reduction of profit tax pursuant to the Investment Incentive Act, i.e. the amount of 297,308 euros. The Ministry of the Economy, Entrepreneurship and Crafts was paid 111,818 euros for the co-financed R&D project SafeTram, which the Institute conducts in co-operation with the Faculty of Electrical Engineering and Computing, for the SafeLog project the amount of 338,815 euros and the 5G-Smart Sense project the amount of 59,640 euros.

#### Donations and sponsorships

The Institute's long-term strategy is to promote partnerships with engineering schools and to encourage development and exchange of knowledge in the field of natural sciences and electrical engineering. That is why in 2021 the Institute directed most of the funds (96%) to education and science, 1% to humanitarian programs, and 3% to other causes.

The Institute participates regularly in the curriculum, congresses and exhibitions, awards the best students from engineering schools, and as a part of the KONČAR Group participates in joint humanitarian programs.

Donations and sponsorships were **0.15 %** value added



#### <u>GRI 203</u>

## Indirect economic impacts

MANAGEMENT APPROACH

#### 103-1

#### Explanation of the material topic and its boundary

Scientific-research organizations should be involved in national and international projects to ensure co-financed funding and the ability to adopt state-of-the-art scientific methodologies and procedures, create innovations and evaluate their own work.

The topic is material due to the significant interest of stakeholders - employees, shareholders, partners and the Institute.

The company is influenced by its own activities, as well as by the activities that are the result of business relationships with other Group companies and the scientific community.

#### D3-2 The management approach and its components

The Institute is an accredited scientific organization in the field of technical sciences, whose sole owner (shareholder) leaves the overall profit for its development. The tradition of applied research and development of products and technology at the Institute has been developed for 60 years and has played a major role in the production program of KONČAR Group. Examples are the development of key electronic and power components and communication equipment and solutions for low-end trams and electric and diesel trains. Knowledge acquired by participating in R & D projects and product creation has enabled the development of new business activities, further growth and acquisition of new competencies, creation of desirable jobs and innovation. Acquired references as added value keys are the ones that open the door to new business opportunities.

#### 103-3 Evaluation of the management approach

The importance of scientific and technological development for the overall economic development has been recognized through numerous researches that show that social benefit from investment is considerably higher than private benefit, which is one of the most important reasons for state incentives and financing of this activity.

Value-added products - innovations that ensure a sustainable development and a competitive economy - are produced through scientific research and experimental work.

#### 203-2 Significant indirect economic impacts

The results of participation in national and international projects are the original solutions applicable in practice, whose aim is the exchange of knowledge and ultimately an innovative product competitive on the world market.

#### PROJECT FUNDED BY CROATIAN SCIENCE FOUNDATION



The Croatian Science Foundation approved funding for the IP-2018-01-3670 project titled "Capacitively graded oil-paper insulation behaviour under very fast transients". The CROPIBUFT project was entered into the "Research Project, 01-18 deadline" competition and is expected to last until the end of 2022.

Electric systems are more exposed to transients because of the increasing number of renewable electrical energy sources within the system. Due to their dislocation

and operating instability, these cause more switching operations in the system. Electric devices in the transport system are also exposed to higher long-term stress, and its effect on their isolation needs to be researched.

The extension of knowledge on the behavior of the capacitively graded oil-paper insulation under transients will contribute to the optimization of electrical equipment design and their monitoring, thus increasing their safety and reducing the impact on the environment.

#### PROJECTS CO-FUNDED BY EUROPEAN REGIONAL DEVELOPMENT FUND

The research and development project called Smart Sense – 5G Autonomous Drone System, co-financed by the European

Regional Development Fund, was initiated in early 2021 and is expected to run by mid 2023.

The Smart Sense – 5G Autonomous Drone System is an autonomous and mobile system that can monitor air quality, non-ionizing radiation, and surveil various buildings with on-board cameras. The idea is to develop and implement a 5G gateway on a commercial electric drone and equip it with hardware and software which will enable it to fly autonomously. The goal of the project is to solve the problem of border control and safety, early fire detection and air quality and electromagnetic non-ionizing radiation measuring in order to collect real-time data of an area by using the drone's autonomous flight.

The project is led by Smart Sense from Zagreb, with KONČAR – Electrical Engineering Institute and Montelektro from Sveta Nedelja as partners. The total value of the project is 3.65 mill.  $\textcircled$ , with 2.79 mill.  $\textcircled$  co-financed from the ERDF.



# ENVIRONMENTAL

Rational consumption of energy resources and the establishment of emission control systems in environmental constituents reduce the adverse effects to the smallest possible extent.

## We protect the environment

By responsible management of natural resources and waste disposal in a safe and secureway we protect human health and minimize environmental impact

#### GRI 302

<u>GRI 103</u>

# Energy

#### MANAGEMENT APPROACH

#### Explanation of the material topic and its boundary

The company KONČAR - Infrastructure and Services Ltd., a member of the KONČAR Group, is the lead and coordinator of the infrastructure project "Establishment of a system for comprehensive screening/monitoring of emissions into environmental components at the KONČAR Group – Environmental emissions register". The project collects data on emissions in all environmental components and the Group's investments in the environment.

The company KONČAR - Infrastructure and Services Ltd. has introduced the EMAS (Eco-Management and Audit Scheme) system of ecological management and independent assessment, a voluntary environmental management system developed by the European Commission, intended for business entities to assess, report and improve environmental impacts.

The topic is material due to the significant interest of stakeholders - employees, shareholders and partners and the Institute.

The company is influenced by its own activities, but also the activities that result from business relationships with other Group companies.

#### <u>03-2</u> The management approach and its components

Most of the Institute's constructed facilities were either reconstructed or they are currently undergoing reconstruction in accordance with the energy efficiency rules of buildings in order to reduce costs for energy and greenhouse gas emissions. Business activities of the Institute affect energy consumption. The consumption and its costs are monitored and measured, all major deviations are analysed, and risks assessed.

#### 103-3 Evaluation of the management approach

The Institute purchases electricity and heat from the distributor KONČAR - Infrastructure and Services Ltd., a company within the KONČAR Group, which supplies Končar's locations with energy (electricity, gas, heat and compressed air), water (cold, warm, technological) and provides drainage systems.

Building envelope was reconstructed in 2021 to achieve energy efficiency of the building and reduce the total energy required to heat and cool the Institute's administrative building (P-building). Since the P-building consumes about 40% of all heat energy used for the Institute's buildings, this envelope reconstruction will lead to significant savings in energy consumption. Calculated heating energy needs for real climatic data was 288 MWh/a before the envelope reconstruction, and only 174 MWh/a after the reconstruction, which amounts to savings of 40% and an annual reduction of 29 t of carbon dioxide.

#### Energy consumption within the organization

The consumption of electrical energy increased in 2021 by 21%, which is due to increased operations compared to 2020. Heat consumption reduced by 4% compared to 2020, and as much as 16% compared to 2019. Fuel consumption for official cars also decreased from the previous year in relation to the limited movement due to the spread of the SARS-CoV-2 virus.



#### Indirect energy consumption

	Consumption of electricity Heat			consumption		
	MWh	GJ	MWh	GJ		
2017	607	2187	1439	5181		
2018	716	2580	1792	6452		
2019	891	3209	2178	7844		
2020	680	2451	1899	6839		
2021	827	2978	1829	6585		



#### Emissions

#### MANAGEMENT APPROACH

#### Explanation of the material topic and its Boundary CO2 emissions by weight The same description applies as to GRI 302 Energy and GRI 305 Emissions.

#### The management approach and its components

Evaluation of the management approach

Direct and indirect emissions include fuel consumption of company-owned vehicles, fuel consumption of privatelyowned vehicles used for business purposes and fuel consumption of planes are also included.

To promote energy efficiency in traffic, consideration is being given to procurement of official hybrid and/or electric cars.

	CO <sub>2</sub> emissions per activity in tonnes						
	Fuel CO <sub>2</sub> (t)*	Electricity CO₂(t)*	Heat CO₂(t)*	Flights CO <sub>2</sub> (t)*	Emissions total CO₂(t)*		
2017	74.8	168.1	387.7	36.7	667.3		
2018	60.3	198.4	482.8	48.7	790.2		
2019	62.0	205.7	587.0	24.5	879.2		
2020	51.5	0**	511.8	13.2	576.5		
2021	56.5	0**	492.8	8.7	558.1		
Scope	Scope 1	Scope 2		Scope 3			

m the Manual for Energy Consultants, UNDP contract was signed with HEP Opskrba on the purchase of electricity from renewable sources (ZelEn - Gree A contract was signed energy) on 1.10.2019

The Institute purchases electricity and heat from the distributor KONČAR - Infrastructure and Services Ltd., a company within the KONČAR Group, which supplies Končar's locations with energy (electricity, gas, heat and compressed air), water (cold, warm, technological) and provides drainage systems.

Since 2019, the Institute has been using green energy (ZelEn), which guarantees that the electricity needed in the business is produced from renewable energy sources, further contributing to the reduction of CO2 emissions.

Most of the Institute's constructed facilities were either reconstructed or they are currently undergoing reconstruction in accordance with the energy efficiency rules of buildings in order to reduce costs for energy and greenhouse gas emissions.



#### 305-1/2 Total

#### Total direct and indirect greenhouse gas emissions per weight

A significant reduction in total CO2 emissions is the result of the supply of neutral electricity ZelEn. Annual fuel consumption of vehicles and planes is directly dependent on business activities and increased number of travels and diagnostic tests on site (transport of measuring equipment and test engineers).

#### Waste

#### MANAGEMENT APPROACH

#### Explanation of the material topic and its boundary

Since introduction of Environmental Management System (EMS) in 2002, waste has been disposed in the Institute in accordance with Croatian laws and regulations. EMS applies to all organizational units (business units and services), all working areas, all places of work and work resources, all workers and other persons who have access to or stay in the Institute's premises for any reason whatsoever.

The topic is material due to the significant interest of stakeholders - employees, shareholders and the Institute.

The company is influenced by its own activities, but also the activities that result from business relationships with other Group companies.

#### <u>103-2</u> The management approach and its components

In Laboratory for Physical and Chemical Testing the work with chemicals is under constant monitoring, and the prescribed environmental measurements and testing are carried out. All the employees in the Laboratory are technically competent for work with poisons, have completed courses in toxicology in accordance with the applicable legislation, so that there is full compliance with legal requirements. Safety data sheets for dangerous substances, instructions and other documentation are maintained and compliant with GHS and REACH directives.

#### Evaluation of the management approach

Proper disposal and classification of waste is an on-going task of all employees, and raising awareness of the importance of the environment and training on the culture of waste disposal in the Institute is carried out with all new employees.

The Institute was neither fined nor sanctioned in any other way for non-compliance with environmental laws and regulations.

#### Waste by type and disposal method

Our work processes generate waste that requires special disposal methods including recognition of hazardous waste, collecting, temporary storage, disposal by the authorized waste disposal contractors, keeping prescribed records and delivery of data about waste.

The effectiveness of the measures taken shall be checked on an annual basis and an internal audit shall be carried out to determine any deficiencies. The amount of municipal, mixed waste is monitored, measured and steps are taken to improve the collection and disposal system.

The quantity of waste metal and cardboard is directly influenced by business processes, i.e. by increase of purchases, deliveries and investments in the current year.



#### Hazardous and non-hazardous waste



#### Non-hazardous recyclable waste



Waste type	2017	2018	2019	2020	2021
Municipal waste (mixed) (m <sup>3</sup> )	127	112	107	117	137
Hazardous waste (t)	3.55	3.47	4.75	3.82	9.56
Non-hazardous waste (t)	5.27	10.60	8.35	6.07	22.10

<u>GRI 400</u>

#### SOCIAL

<u>GRI 401</u>

## Employment

Solving complex industrial challenges and participation in international and national projects encourages employment on challenging tasks and creates new desirable jobs.

#### We protect people and the community

Our business activities reflect global needs and ambitions for solving complex technological challenges, protecting people and the community

#### 103 MANAGEMENT APPROACH

Explanation of the material topic and its boundary

The Institute mostly employs young and college-educated people, and by working on research and development tasks together with experts from other KONČAR companies or in partnerships at national and international projects they gain new knowledge and team work experience. Satisfied and motivated employees are the basis of our long-term business success, and well-educated and competent experts are our greatest asset.

This topic is material due to the significant interest of stakeholders - employees, shareholders and the Institute.

The company is influenced by its own activities.

#### The management approach and its components

Motivation of employees for scientific and professional development, personal advancement and their focus on the areas of interest of the Institute are a huge force for technical creativity and competition at the global level.

The Institute offers its employees the acquisition of expert knowledge, challenging jobs and fair working conditions. They include fair compensation for their work, additional benefits, and flexible work practices to meet individual employee needs. All employees are provided with continuous personal and professional development through education and training programs.

#### Workers' Council

All employees have the freedom of association and the right to collective bargaining. Through the Workers' Council, employees have the opportunity to participate in decision-making on issues related to their economic and social rights and interests. The representative of the Workers' Council participates in the regular work of the Institute's Supervisory Board and annual meetings of the Management where business plans are presented for the next period. On the Intranet there is a special section of the Workers' Council with information about the conclusions of the Works Council's meetings, valid contracts and news related to employee interests.

#### Employee satisfaction survey

Employee satisfaction surveys have been introduced as an important tool by which employees can point to realized improvements and possibilities for further improvements, so that the Institute can achieve the best working conditions possible. Strong employee engagement is essential for successful long-term operations of the Institute and the quality of products and services provided to its customers (more on page 36).

#### 103-3 Evaluation of the management approach

Challenging tasks, comfortable and air-conditioned workspace, modern equipped laboratories, decorated landscape, intranet and the availability of international databases of worldwide published papers are the main features of the business environment of today's employees of the Institute.

Job recruitment, selection and retention procedures are constantly being promoted and aligned with new challenges. External and internal communication and improvements in two-way inclusion process require additional attention in the coming period.

401-1

At the end of 2021, the Institute had 170 employees, i.e. 1 associate more than at the end of 2020. In 2021, 15 new associates were hired and 14 left the Institute, out of which 3 retired and 11 ended their employment by agreement. Over the past ten years, 124 employees have left the Institute, and 121 new employees hired.

#### Number of employees 2012 - 2021

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
New employees hired	7	9	9	11	15	21	10	9	17	15
Employees who left the Institute	14	7	5	12	12	20	6	13	15	14
Total number of employees on 31 December	162	164	168	167	170	171	173	167	169	170

#### Benefits provided to full-time employees

Additional benefits create a positive atmosphere that favours the climate of unity and cohesion in the Institute, despite differences in monthly wages that are related to the success of performance of each business unit or service:

- Educational and professional programmes for improvement of knowledge and skills
- Paid business trips and participation in international conferences
- Christmas and Easter bonuses, holiday cash grants
- Jubilee financial rewards for 10, 15... years of service in the Institute
- Money reward for completion of graduate and

postgraduate studies

- Financial aid in the case of sick leave exceeding 90 days
- Allowance in the case of death of immediate family member
- Allowance for each new-born baby
- Regular medical check-ups
- Leisure time recreation
- Mobile phone.

There are special bonuses for each successfully completed job. Corporate loyalty is fostered and each employee who wishes to improve their knowledge in the areas that are of interest for the Institute will have paid expenses of such training or education.

#### MultiSport program

The Institute, in collaboration with the company Benefit Systems, has enabled its employees to use the MultiSport program with more than 50 different sports activities in more than 360 sports facilities.

The programme encourages employees to live a healthy and active life and adopt daily physical activities. In order to provide its employees with a balance between business and private life, the Institute covers 50% of the monthly fee for the use of the Multisport program.

#### Parental leave

All female employees have the right on parental leave, and male employees have the same right in accordance with the decision of the Croatian Institute for Health Insurance (HZZO). During the reporting period, 4 women exercised their right to maternity leave. For one of them the maternity leave has expired and she is back to work.

## **Occupational health and safety**



Healthy and secure working environment is recognized as our greatest responsibility and contribution to creating quality jobs.

#### 103 MANAGEMENT APPROACH

#### 103-1 Explanation of the material topic and its boundary

Occupational health and safety risk management is the overall process of identifying, assessing and monitoring the risks, and in accordance with them taking the necessary measures and controls for the purpose of eliminating risks, reducing risks and / or controlling them.

The topic is material due to the significant interest of the involved stakeholders - employees and the Institute.

The company is influenced by its own activities, as well as activities outside the boundaries of the Institute's influence.

#### <u>103-2</u> The management approach and its components

Ensuring a healthy and secure work environment for employees through the OHSMS management system has been recognized as our major responsibility and consequently gained the trust of users, customers, foreign investors and improved global competitiveness of the company in the market.

#### <u>103-3</u> Evaluation of the management approach

Safety at work and occupational health care are essential elements of working conditions governed by applicable Croatian regulations and OHSMS procedures.

#### <u>403-1</u> Occupational health and safety system

OHSMS is a part of the integrated management system defined by the OHSAS 45001 and represents a mechanism for occupational health and safety. The fundamental goal of the system is to ensure a healthy and safe working environment, i.e. to remove or reduce the risk of work injury and occupational illness for all employees of the Institute and other persons to whom the activities of the Institute may have an adverse effect.

#### 403-2 Hazard identification, risk assessment, and incident investigation

In accordance with Croatian regulations and OHSMS procedures, dangers are identified, risks assessed and monitored (both those affecting health and safety of employees and third parties), and accidents and injuries at work investigated and analysed. Controls and audits are conducted in accordance with OHSAS 45001, and they include a complete OHSMS system: estimates, goals, analysis, measurement, stakeholder feedback and results, undertaken activities and improvements.

#### 403-3 Occupational health services

The Institute has a contract with a medical specialist who regularly monitors the health status of workers through periodic and extraordinary medical examinations. Examinations are carried out during working hours, and the health institution in which the examinations are conducted is located directly next to the Institute's location.

#### Worker participation, consultation, and communication on occupational health and safety

Workers are involved in health and safety during risk assessments. All workers can initiate or suggest improvements, more practical solutions, eliminate omissions and irregularities in the implementation of workplace safety regulations or improve the management of occupational health and safety through communication channels: representatives at the Workers' Council and the Commissioner for Occupational Safety, either publicly (verbally or in writing) or anonymously (polls and mailbox).

#### Worker training on occupational health and safety

The following trainings have been carried out:

- safe work and starting fire extinguishing of all new employees
- operation of forklifts, crane lifts, self-propelled lift platform and scaffolding
- handling hazardous chemicals
- for authorized persons in the field of occupational safety

#### 403-6 Promotion of worker health

Once a year, all employees can have a systematic medical examination at a selected healthcare facility.

# 403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships

Occupational health and safety risk management is carried out in accordance with OHSMS procedures, with a view to defining the methodology for permanent and timely hazard identification (potential / current), risk assessment of possible adverse effects on health and safety at work and determination of control mechanisms.

#### <u>403-8</u> Workers covered by an occupational health and safety management system

OHSMS refers to all organizational units (business units and services), all working spaces, all places and means of work, all employees and other persons who have access to or stay in the Institute's premises for any reason.

#### 3-9 Work-related injuries

In 2021 3 occupational injuries occurred and were reported in accordance with regulations and OHSMS procedures. There were two injuries (1 severe and 1 light) that happened while travelling to or from work, and a light injury at workplace, which involved a cut caused by a work-related tool and had no lasting consequences to the employee's health.

The rate of work-related injuries that were recorded in 2021 is 1.75 based on 200,000 hours worked.

#### Work injury information

	2017	2018	2019	2020	2021
Average number of employees	169	172	169	169	169
Number of fatal injuries	-	-	-	-	-
Number of group injuries	-	-	-	-	-
Number of severely injured at work	1	1	1	1	1
Number of light injuries at work	2	3	1	-	2
Total number of injuries	3	4	2	1	3
Number of lost working hours	408	1008	1672	208	208

3-10 Work-related ill health

None.

#### <u>GRI 404</u>

## **Training and education**

We encourage personal development and improvement of employees through professional education, foreign language learning, IT training and education for quality systems, environmental protection and occupational safety.

#### MANAGEMENT APPROACH

Explanation of the material topic and its boundary

The focus of employees on scientific and professional training, as well as encouraging excellence and innovation in creating competitive advantages contribute to the success in the development of new products and services. The

advantage over others is achieved through faster and more versatile learning, and the acquired knowledge and competences give us an advantage on the market.

The topic is material due to the significant interest of stakeholders - employees, customers and the Institute. The company is influenced by its own activities.

#### 103-2 The management approach and its components

Employees are given the opportunity of professional education, foreign language learning, IT training and education for quality systems, environmental protection and safety at work. New knowledge is gained through postgraduate doctoral and specialist studies as well as work on research development tasks in mixed teams of KONČAR Group companies, at seminars and in active participation in international congresses and exhibitions. Creativity and leadership development are encouraged through management education programs.

Internal processes are continually improved in the HRM system (the system of monitoring the staff of the Končar Group), and effects and costs are monitored through the procedures in the Annual Education Plan and the Program of Training and Education.

#### 103-3 Evaluation of the management approach

With the 2020+ Integral Strategy for KONČAR the strategic initiative called "Creating a development plan for advanced HR functions on the KONČAR Group level" was adopted. The strategy also initiated the "HR Academy" – professional development in human resources management. Along with implementing the above HR development plan within the company, in 2020 the Institute independently started implementing pilot activities expected to improve and enhance the development of human resources within the Institute.

# Average annual number of training hours per employee

In 2021 63% of employees attended some form of training or education, and average lesson time was 77 hours per employee.

Doctoral and postgraduate students are men, which increases the difference in the average hours of training and education in 2021 in favour of men. Also, training for types of jobs mostly made by men (work with a forklift, crane and self-propelled lifting platform).

# 404-2 Programs for upgrading employee skills and transition assistance programs

#### Program for new employees and trainees

The program for new employees and trainees enables familiarization with the Institute's legal acts, management systems, health and safety protection, and the basic concepts of corporate social responsibility and the application of sustainability principles at the Institute.

#### Employee Handbook

In 2021 we published the Employee Handbook to help new employees settle in the new work environment. The handbook describes the Institute's activities, policies, strengths and responsibilities that are common to all employees. It also provides guidelines and various useful information and links for easier communication, understanding of values and business culture, as well as to help new employees address the tasks that are expected of them.

# Average hours of training and education in 2021

Category	Hours
Managing Board (Top management)	86
Heads of business units and services (Middle management)	20
Heads of laboratories and sections (Lower management)	132
Employees	73

Per gender





The electronic version of the handbook is updated periodically, and the updated version is always available on the intranet.

#### Acquisition of specialist knowledge and scientific vocation

Postgraduate doctoral studies are attended by 7 associates at three technical faculties of the University of Zagreb, 1 attendees are studying postgraduate specialist studies and 3 undergraduate and graduate studies. The Institute has 15 scientists enrolled in the Register of Scientists, 5 of them with the status of research associate and 1 senior research associate. In 2021 11 employees attended German and Spanish language courses.

#### KONČAR Academy

KONČAR Group conducts the programme Fundamentals of Business Administration (FBA) with candidates up to the age of 35 who are capable of modern management. The aim of the program is to provide opportunities for developing work independence and creating a base for potential young managers. Six generations were educated under this programme, and an advanced education cycle was carried out to stimulate business thinking and develop specific managerial competencies. So far, 21 associates of the Institute have attended a training program for management candidates.

#### KONČAR HR Academy

With the 2020+ Integral Strategy for KONČAR, the strategic initiative called "Creating a development plan for advanced HR functions on the KONČAR Group level" was adopted to clearly define the framework for human resources development within the Institute. Within the strategy, the Institute has defined two starting points for professional development in HR management, called "HR Academy", which represent the initial steps in improving human resources management within the Institute. Other initiatives are also being implemented according to the advanced HR development plan on the Group level, primarily the new HRM system.

#### Establishment of the KONČAR Digital Factory Lab

The Digital Factory Lab (DFL) was established within the KONČAR Group, representing an organizational platform for open collaboration and competency development through trend monitoring, adoption and implementation of advanced production and digitalization technologies and the development of new business models in the Group's areas of interest.

The goal of the DFL is to accelerate the development of and strengthen strategic competencies and organizational abilities of KONČAR to apply the Industry 4.0 paradigm with the use of advanced digital tools and technologies.

#### Internally developed training programs

In late 2020, internal training called "Introduction to neurolinguistic programming (NLP)" was started for the Institute management. This was an internal pilot training program with an aim to improve and enhance HR development within the Institute.

In 2021, a pilot training program was started for 8 employees from one business unit. The title of the program was "How to develop your talent and potentials – a methodology to achieve set goals" and it consisted of 6 weekly sessions. The goal of the program was to enhance the synergy and productivity, learn how to improve time management and to manage stress. The training received positive feedback and is planned to be expanded to other business units.

Individual internal coaching with employees who wish to develop their personal potentials or overcome some personal challenges is regularly being conducted since late 2021. Individual or team support through internal coaching or some other way will also be provided in the following cases:

- Transfer of employees to new positions;
- Reorganization within the company;
- In case of an individual's or team's underperformance, inadequate behavior or communication among employees.



# Diversity and Equal Opportunity



By accepting and encouraging diversity and equal opportunities, we contribute to both organizational culture and the general goals of non-discrimination and gender equality.

#### MANAGEMENT APPROACH

#### Explanation of the material topic and its boundary

The Institute is a signatory of Diversity Charter, a voluntary initiative of companies which promote implementation of diversity and non-discrimination principles as fundamental values of modern society.

Diversity and non-discrimination policy is a positive practice of the Institute based on internal rules (Rules of Employment.), Croatian legislation (Labour Act and Anti-Discrimination Act), General Declaration of Human Rights, ILO Declaration on Fundamental Principles and Rights at Work, UN Global Compact (initiative for corporate social responsibility) and UN Guiding Principles on Business and Human Rights.

This topic is material due to the significant interest of stakeholders - employees, shareholders and the Institute.

The company is influenced by its own activities.

#### 103-2 The management approach and its components

Diversity management assumes systematic and planned focus of the Institute towards attracting and retaining employees of different profiles and competencies to achieve competitive advantage through an inclusive working environment and teamwork.

The diversity and non-discrimination policy of the Institute is directed towards better understanding of the impact of diversity among all stakeholders of the Institute, defining goals, roles and responsibilities and monitoring measurable impact indicators.

The Diversity and Non-Discrimination Policy in the Workplace is available to all the stakeholders on the Institute's website and intranet, while the Diversity and Non-Discrimination Action Plan is available on the Institute's intranet.

#### Evaluation of the management approach

Action plan to promote diversity and non-discrimination 2022 – 2025 was developed in accordance with productivity results and progress estimates from the previous period.

The annual Report for 2021 provides an assessment of progress made towards achieving measurable action plan targets in 5 key areas:

KEY AREAS	ASSESSMENT OF THE IMPLEMENTED MEASURES IN ACHIEVING THE TARGETS
Diversity management	Two out of three measures were successfully implemented, setting responsibilities and time frames as well as measurable impact indicators in achieving this target
Recruitment, selection and retention	Recruitment measures have been fully implemented, while retention measures need to be intensified in the following period in order to achieve satisfactory improvement
Communication and education	5 measures have been set out to ensure the integration of the principle of diversity into the impact management process and education and development programs. According to the respondents' assessments, two indicators have improved, while others need to be redefined in the forthcoming period
Komunikacija i obrazovanje	The Diversity and Non-Discrimination at Work Policy is accessible to all stakeholders, but no process has been carried out to verify that its principles are understood at all levels of the Institute
Balance of private and business life	Employees are satisfied with flexible work practices that allow them work-life balance and continuous support for personal progress

RI 405

#### <u>405-1</u> Diversity of governance bodies and employees

The Institute's main activities stipulate that the Institute employs men in the highest percentage. Nevertheless, the share of women among employees has been increasing and in 2021 amounted to 27%. The Institute's managing structure changes dynamically. Compared to 2012, when the share of women in the Managing Board and middle management (heads of business units and services) was 23%, by 2021 this share increased to 62%.

Preservation of expert and specialist knowledge is vital for the Institute, and knowledge transfer and mentoring have been given great attention in the past fifteen years. As a result of the systematic rejuvenation and the natural generation shift, the age structure of employees changed significantly. From the average 40 years of age of employees in 2012 to the present it has decreased to 39 years in 2021. The average age of management has been decreasing steadily. The average age of the Management Board and middle management (heads of business units and services) decreased from 54 in 2012 to 48 in 2021.

#### 405-2

#### Ratio of basic salary and remuneration

Category	M/F
Heads of business units and services (Middle management)	1.71
Heads of laboratories and sections (Lower management)	0.93
Employees	1.19

#### Comparison of percentages of female employees in the managing board and middle management in 2012 and 2021



#### Percentages of female employees

Category	2012	2021
The Managing Board and middle management (heads of business units and services)	23%	62%
Lower management (heads of laboratories and sections)	11%	13%
Employees	25%	27%

#### Average age

Category	2012	2021
The Managing Board and middle management (heads of business units and services)	54	48
Lower management (heads of laboratories and sections)	43	41
Employees	40	39

#### <u>GRI 413</u>

A QUALITY

#### Communities

By exchanging knowledge and partnership, both scientific community and the Institute acquire new competencies, creating new opportunities for development and value added in the wider community.

#### MANAGEMENT APPROACH

#### Explanation of the material topic and its boundary

The collaboration of the Institute and the scientific community has been fostered for many years through various activities and is constantly improving. Encouraging science and economy cooperation directs the scientific community to address scientific research topics that could bring benefits to the economy. It also demonstrates how the scientific community can contribute to the development of society not only through education but also through applied research for the sake of innovation.

Joint activities of the Institute and the scientific community:

- Partnership on joint scientific research projects
- Participation in the curriculum
- Mentoring, membership in professional commissions, boards, jury
- Education (graduate, postgraduate and specialist)
- Awarding the best students to three technical faculties
- Professional student and student practice, professional visits
- Exchange of knowledge from which scientific papers, conferences, expert meetings emerge.

The Institute invests in activities contributing to the sustainable development of the scientific community:

• applied scientific research

• Inclusion of the scientific community in the development of the economy

innovations

Connecting the economy with the scientific community is also strongly encouraged by the EU with a view of to transferring new technologies and knowledge from faculties to industry, aiming at improving the existing and developing new high technology products and services.

The topic is material due to the significant interest of the involved stakeholders - the employees, the scientific community and the Institute.

The company is influenced by its own activities.

#### 103-2 The management approach and its components

The Institute gains new knowledge by linking with the scientific community, encourages the publication of professional and scientific papers, exchanges the existing knowledge of scientists and new knowledge gained through research on concrete technical problems, innovation is being created and costs are reduced as European and national resources are used for research according to the needs of the economy.

The impact of collaboration between the scientific community and the Institute can be seen in several aspects: material benefits in the final results of successfully implemented projects with industrial application, exchange of knowledge and education, and expert and scientific papers.

	2017	2018	2019	2020	2021
Co-financed projects with scientific community	3	3	3	4	4
Published papers	50	18	41	17	24
Attendants of postgraduate doctoral studies	10	9	6	6	6
Defended PhD theses	1	1	3	0	0
Members of the Institute teaching at faculties	10	10	10	10	10

By joint work on research and development projects, the Institute and the scientific community jointly take the risk regarding project results, commit themselves to deadlines for implementation of the results, and responsibility for the development of the economy and society.

#### Evaluation of the management approach

The stronger involvement of the scientific community with the economy in more developed societies is the driver of the society as a whole. The partnership between the Institute and the scientific community and the experience gained were the basis for proposing measures to strengthen the innovative activities in the National Innovation Strategy 2014 - 2020. Measures to promote mobility between the education, science and industry sectors have been proposed and stimulate synergies in innovation between two and more sectors.

#### 413-1

#### Operations with local community engagement, impact assessments and development programs



#### Information-documentation service (INDOK) and library

INDOK and the library share resources with the local and international community and provide access to information. They have a key role in ensuring access to information, supporting research and development, as well as in safeguarding and protecting professional knowledge.

INDOK has more than 20,000 printed professional books and more than 800 scientific and professional journals in the fields of electrical engineering, electronics, energy, transport and natural sciences. Users can access databases of scientific and professional e-books, e-proceedings, e-papers, PhD, MSc and BSc theses.

#### Support for engineering sciences and awards for best students

The Institute builds up partnership with the scientific community, develops and supports both professionally and financially organisation and participation at scientific meetings, conferences and symposia that enable exchange of experiences and development of science, and also awards best students at three faculties of engineering. Since 2003, the Institute has been a supporting member of the Croatian Academy of Engineering (HATZ).

In 2021, as in every year, the Institute has financially awarded the best students at the Faculty of Electrical Engineering and Computing in Zagreb (Josip Lončar Award), and the Faculty of Chemical Engineering and Technology in Zagreb (Vjera Marjanović-Krajovan Award).



#### Practical training

Under the guidance of expert mentors, they had the opportunity to acquire practical knowledge and skills. Mandatory training gives them the opportunity to take part in solving concrete every-day problems, and their teachers get feedback on knowledge and skills which the contemporary market expects from future engineers, what in turn enables better adaptation of the curriculum to current needs of industry and technology trends.



#### Visits of pupils and students

In 2021, 3rd and 4th year students from the Zagreb University of Applied Sciences' Electrical Engineering and Automatization programs visited the four laboratories of the Laboratory Center, where they were introduced to the laboratories purpose and detailed descriptions of electrical equipment and testing performed. Practical knowledge and concrete solutions are the most important segments of successful training, especially in engineering.

#### Entrepreneurial Mindset for Youth 2021 Conference

The Entrepreneurial Mindset for Youth Conference, under the slogan Dare to dream big, attracted 1300 young people as well as numerous successful entrepreneurs from Croatia. Speakers at the

conference intended to incite the youth to have an entrepreneurial mindset and to dream big. Siniša Marijan, PhD, the President of the Managing Board of the Institute, shared some of his rich experience in business and sent a message: "Do not be afraid to suggest new solutions and share new ideas for fear that someone would think you don't know something. On the contrary, us older and more experienced businesspeople love hearing suggestions and new ideas, especially if motivated by curiosity and diligence."

#### Knowledge at Work Foundation – KARIJEROTEKA

Mechatronics engineer Marko Purić gave a lecture on the subject Mechatronics – my future career on the Knowledge at Work – KARIJEROTEKA online platform intended for 8th grade elementary and 1st to 4th grade high-school students. He presented his career path at the Institute, explained what skills help him address the challenges of his everyday working environment and why he chose this profession. KARIJEROTEKA aims to inspire children and youth to learn more about exciting jobs through conversations with people actually doing them, thus exploring their career options in Croatia.

#### Awards and recognitions

# The "Hrvoje Požar" award for innovations in energy, and the award for exceptional contribution to the STEM fields

Eduard Plavec, PhD, has received "Hrvoje Požar" Award for innovations in energy, as well as the annual award of the Zagreb County Association of Technical Culture for his exceptional contribution to the STEM fields. This is awarded for extraordinary achievements through voluntary or professional creative, pedagogical, vocational, scientific, or organizational participation and work in technical culture.



#### HRIO – Croatian Sustainability Index for Human Rights Award

During the 13th conference on sustainable development the Institute received the HRIO (Croatian Sustainability Index) award in the human rights category. HRIO – Croatian Sustainability Index (former Corporate Social Responsibility Index) is an annual award for small, medium, large, and public companies given by the Croatian Business Council for Sustainable Development and the Croatian Chamber of Economy. The awards are also given to companies that achieve the best results in one of the six categories: Governance, Environmental Protection, Working Environment, Human Rights, Children's Rights and Community.

The institute has a 60-year-old tradition of protecting human, and particularly labor rights. The KONČAR Group employees are at the heart of its development and success and are thus a priority. The Collective Agreement and other bylaws define the rights beyond the statutory right to freedom of association and collective bargaining. Institute associates promote the protection of human rights in all actionable areas.

The Institute operates according to the Constitution and all positive laws against forced labor.

The Institute operates according to positive laws against child labor; thus children are not engaged in any business activities or in any other form.





# GRI content index: Core option

GRI standards are a globally accepted tool for sustainability and sustainable development reporting, and they are periodically revised to enable companies to communicate most appropriately the impacts of their economic, environmental, social and governance performance.

Set of modular GRI standard were created with a view to improving global comparability and quality of information, what ensures higher transparency and responsibility of the company.

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