



› ANNUAL REPORT 2017

TNO innovation
for life

TNO.NL

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› MEET OUR BOARD OF MANAGEMENT



› COMPOSITION OF THE BOARD OF MANAGEMENT

FROM LEFT TO RIGHT:

- › WIM NAGTEGAAL, CHIEF OPERATING OFFICER (COO)
- › JOS KEURENTJES, CHIEF SCIENTIFIC OFFICER (CSO)
- › CIS MARRING, CHIEF FINANCIAL OFFICER (CFO)
- › PAUL DE KROM, CHIEF EXECUTIVE OFFICER (CEO)

REPORT OF THE BOARD OF MANAGEMENT

TNO IN 2017: 85 YEARS OLD AND STILL GOING STRONG

The past year has been an eventful one for TNO, in which we realised some key innovations that contribute to solving various challenges in society. While it has been a difficult year from an operational viewpoint, the future nevertheless looks promising: the coalition agreement, for example, provides for additional investments in applied research after many years of austerity. Furthermore, our solid new organisation and strategy have laid the foundation for an organisation that can respond quickly and effectively to new developments. The implementation of this strategy will be a key focus in the upcoming year.

TNO initiated a strategic change in 2017 which was necessary in order to achieve our mission of 'connecting people and knowledge in order to create innovations'. [The Strategic Plan 2018-2021, Flywheel for Innovation in the Netherlands](#), was presented to the Ministry of Economic Affairs. In parallel, we have also been working on building a new organisational structure, which became effective on 1 January 2018.

A majority stake in TNO Bedrijven was sold in 2017. The 'Food Innovation' group was transferred from TNO to Wageningen University & Research, under the banner of Dutch Food Initiative. We have been working hard on building the partnership in sustainable energy between ECN and TNO, which is expected to commence in the first half of 2018.

HIGH-PROFILE INNOVATIONS

TNO once again created a series of innovations in 2017 for customers in the Netherlands and internationally.

The *Sentinel-5P* satellite of the European Space Agency (ESA) was successfully launched in October. The satellite is equipped with the Tropomi measuring tool, which was manufactured in the Netherlands and which measures air quality and the distribution of greenhouse gases worldwide. TNO designed and manufactured the optical instrument, in partnership with various industrial players. Scientists at the Royal Netherlands Meteorological Institute (KNMI) and other organisations use the measurements for research into weather and climate, among other areas. The first results have exceeded all expectations due to the exceptionally high resolution of the images, which show air pollution on Earth, down to the city level.

TNO has forged a partnership with Leiden University Medical Center (LUMC) in efforts to turn the 'Lifestyle as medication' campaign into a national and international success.

This approach reverses traditional procedures, based on the notion that expensive medications against diseases become redundant or can be significantly reduced if people change their lifestyles and diets. General practitioners, consultant physicians, government agencies, educational institutions, insurance companies, employers and other entities are all involved in the project in order to make their own contribution to this innovation. In addition to improving public health, the project could potentially generate billions of euros in cost savings.

TNO experts made regular media appearances throughout the year to discuss blockchain technology. When the first bitcoin was introduced in 2009, TNO immediately embraced this technology and set out to investigate the threats and opportunities for our society associated with the technology. As part of the Techruption programme, TNO and its partners are developing practical applications for areas such as start-ups, agri-food, the Port of Rotterdam, energy companies and the financial industry. TNO is also involved in training future blockchain experts.

VoltaChem, a joint initiative of the Chemicals Top Sector, ECN and TNO, grew substantially in 2017. The number of partners nearly doubled, and the technologies developed are being used for various industrial purposes. In the future, industrial electrification will result in a sharp reduction in carbon emissions. TNO has developed tools designed to assist with making the appropriate investment decisions. In addition, the two following platform technologies have been developed:

- Electrochemical conversion from biomass to high-quality plastics.
- From carbon to formic acid and carbon monoxide for use as green fuel. Large-scale use of this substance could help the Netherlands save megatons in carbon and is expected to result in a unique export product for the Dutch high-tech industry.

CHALLENGING OPERATIONAL YEAR

TNO's research and innovation activities generated an operating result of EUR 0.5 million. This relatively low operating result is largely due to a disappointing order intake in 2017.

The impact this created on revenue and the number of projects carried out by the organisation resulted in several reorganisations, and TNO was forced to several reorganisations, which included a number of redundancies during the year.

RESULT OF THE SALE OF TNO BEDRIJVEN

In contrast to this operating result, TNO's earnings from investments were exceptionally high: EUR 57.8 million. This was largely the result of the sale of a majority stake in TNO Bedrijven to its strategic partner First Dutch Companies. The subsidiary TASS (from the portfolio of the former TNO Bedrijven) was sold to Siemens, which shows that TNO's technological spinouts lead to meaningful activity and employment.

TNO and the Ministry of Economic Affairs agreed that incidental proceeds from this [sale](#) would be allocated, among other things, toward the Technology Transfer programme. This programme is designed to expediate the process of launching high-quality innovations in the market. Through this programme – in line with its objective to act as a 'flywheel of innovation in the Netherlands' – TNO is focusing more strongly on effectively translating applied research into practical solutions in the wider world.

85TH ANNIVERSARY

The public joined in the celebrations of our 85th Anniversary in 2017, during an open day hosted at various sites, where they could learn more about the work performed by TNO experts. Hundreds of visitors visited eight of TNO's locations and were keen to participate in the research activities which had been organised especially for the occasion.

This included measuring particulate matter in the kitchen and testing a virtual driving simulator.

READY FOR THE FUTURE WITH A NEW STRUCTURE

In addition to the partnerships with other research and educational institutions, the Strategic Plan for 2018-2021, *Flywheel for Innovation in the Netherlands*, also focuses on the further development of TNO's position in the innovation landscape. In order to be able to achieve our strategic objectives, we decided to change our organisational structure. This has resulted in a new organisation, in which the matrix structure based on five domains has been replaced with nine units. This is an effort on our part to be more in line with the market and in touch with social trends. The new structure became effective on 1 January 2018, following the approval of the Works Council.

MORE PROMINENT POSITION

TNO is pleased with the decision of the new Dutch government to increase funding for applied research. The organisation is currently in talks with several ministries, Top Sectors and research and educational institutions regarding the further implementation and development of these plans for the coming years. It will enable TNO to better fulfill its role as flywheel for innovation in the Netherlands, for the benefit of both the public and private sectors, and to increase its impact.

SCIENTIFIC IMPACT

TNO produced approximately 800 reports and more than 1,100 publications in 2017, focusing on areas such as the harmful emissions generated by vehicles, inclusive innovative regions, and the evolution of the Netherlands from an exporter to an importer of natural gas. A study by the Center for Science and Technology Studies (CWTS) in Leiden shows that TNO publications are frequently cited in scientific literature: as much as 22% above the global average in the past ten years. This score for amongst international public-private partnerships is even 50% higher. TNO's score in the Leiden ranking gives it a position amongst the universities in the Netherlands.

EVALUATIVE STUDY OF ORGANISATIONS FOR APPLIED RESEARCH (TO2)

The Ministry of Economic Affairs commissioned an external committee to evaluate TNO's research for the past four years. This TO2 study, as it is known, assesses the quality, impact and vitality of the TNO research. On a scale from 1 to 4, the results were as follows:

- Score for quality: 3-4. According to the external committee, 'TNO conducts excellent, high-quality research for its customers and partners. A portion of the research conducted can be classified as world-class.'
- Score for impact: 3. The committee concluded that 'TNO generally maintains strong long-term ties with its customers and partners. The use of this knowledge has great strategic significance for the Dutch economy in particular and/or for solving various challenges in society (including the military/defence).'
- Vitality: 2. The committee has 'great appreciation for the manner in which TNO has managed to adjust to the reduced government funding. The organisation would benefit from greater focus and more critical mass. However, this requires a clear mandate from the government, including a sufficient budget, sufficient autonomy, and a clear demand-driven approach.'

TNO endorses the committee's findings.

CUSTOMER SATISFACTION

Customer satisfaction continues to rise each year. Last year, the score increased to 4.32 on a scale from 0 to 5. The score for knowledge and expertise is 4.63.

* Result from regular operations before taxes -/- 455K + corporation tax gain 976K = rounded off + EUR 0.5 million. See the [non-consolidated financial statements](#).

ENGAGED EMPLOYEES

The annual Employee Satisfaction Survey showed a slight increase in 2017 in the satisfaction score for TNO relative to previous years. The increase in burnout-related complaints arising from the Employee Engagement Survey, however, raises concerns and merits additional focus.

FINAL NOTE

We would like to take this opportunity to thank the 3,000 TNO employees, who, with their passion and drive, make all these successful innovations possible. Furthermore, we are proud to have the opportunity to work together with so many different customers and partners. We would also like to extend our thanks to them for the trust they have placed in TNO. We look forward to continuing to work with them even more closely in the coming year.

PERSONAL DETAILS OF THE MEMBERS OF THE BOARD OF MANAGEMENT

P. de Krom, Chairman/CEO (1963)

In office since 1 March 2015

Management and supervisory positions:

- Board member, Federation of Cooperating Organisations in Applied Research (TO2)
- Chairman of the Supervisory Board of HTM Beheer B.V.
- Member of the Supervisory Board of HTM Personenvervoer
- Director of Royal Holland Society of Sciences and Humanities
- Deputy Chairman of the Supervisory Board, Utrecht University of Applied Sciences
- Board member, Thorbecke Society for Representation and Democratic Governance
- Chairman, Thorbecke table, Sociëteit de Witte
- Member, South Holland Economic Board

W. Nagtegaal, COO, Vice-Admiral BD (1957)

In office since 1 February 2014

Management and supervisory positions:

- Board member, Stichting Nederland Maritiem Land (NML)
- Board member, Stichting Nederlandse Industrie voor Defensie en Veiligheid (NIDV)
- Member, Executive Committee, Nederland Maritiem cluster (NMC)
- Board Chairman, Stichting Maritiem Kenniscentrum (MKC)
- Supervisory Board member, First Dutch Innovations B.V. (FDI)
- Supervisory Board member, The Hague Center for Strategic Studies (HCSS)
- Supervisory Board member, Vereniging Nederlandsch Historisch Scheepvaart Museum

F. Marring, CFO (1963)

In office since 1 February 2014

Management and supervisory positions:

- Board member, Stichting Pensioenfonds TNO
- Supervisory Board member and chair of Oasen N.V. Audit Committee
- Supervisory Board member and chair of Novec B.V. Audit Committee

J.T.F. Keurentjes, CSO (1963)

In office since 1 February 2014

Management and supervisory positions:

- Lecturer, Eindhoven University of Technology
- Board member, TKI HTSM
- Board member, Stichting Holland High Tech
- Member of management team, Energy Top Sector
- Member of Supervisory Board, TKI Bio-Based Economy
- Member of Steering Committee, National Research Agenda
- Member of the Supervisory Board, QuTech
- Member of the Technology and Innovation Committee VNO-NCW (Dutch employers' federation)
- Board member, Nationaal Regieorgaan Praktijkgericht Onderzoek SIA (NRPO-SIA)
- Member, General Management, Stichting Toekomstbeeld der Techniek (STT)
- Supervisory board member, Ventinova Medical B.V.

J. Hoegge, secretary (1969)

In office since 15 October 2014

PROFILE, MISSION AND IMPACT

PROFILE

The Netherlands Organisation for Applied Scientific Research (TNO) was established under Dutch law in 1932. As an organisation established under public law, TNO holds an independent position. The objective of TNO is to adapt research results so they can be used by companies and governments.

TNO's strategy is based on technological developments and trends in society. We have been working closely with our customers and partners to define the following five transition domains: Healthy Living, Defence & Security, Industry, Urbanisation, and Energy. These goals are in line with the challenges and objectives of the Top Sectors and various social issues in the Netherlands and Europe.

MISSION

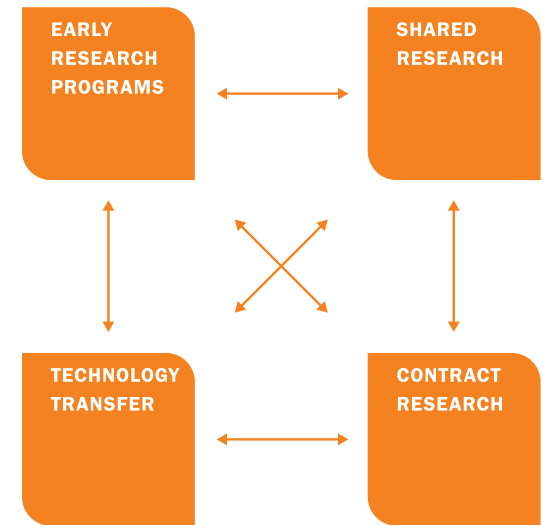
TNO's mission is to connect people and knowledge with the objective of creating innovations which enhance the competitive strength of businesses and the wellbeing of society in the long run. Based on this mission, TNO creates an economic, social and societal impact through its partnerships with numerous companies and organisations in the Netherlands and abroad.

INNOVATION CYCLE: FOUR MAIN FORMS OF RESEARCH

TNO maintains four main forms of research, each of which has a different objective, is directed differently, is funded separately, and has a different legal structure:

- Early Research Programs (ERP)
- Shared Research (public-private and public-public partnerships), including Joint Innovation Centres (JICs)
- Contract Research
- Technology Transfer

These four main forms of research together comprise the TNO innovation cycle.



VALUE CREATION AND VALORISATION

TNO's economic, social and societal innovation impact is created through a process of portfolio management along the axis of the five transition domains, through which knowledge is fundamentally renewed and built through the [Early Research Programs](#). An average of ten of these types of comprehensive research programmes are in place at any given time.

The next step is to further develop these research results in the form of pre-competitive partnerships in public-private research with partners based on Shared Research. This leads to many specific innovations. TNO aims to extend both the public-private partnerships and the public-public partnerships as a powerful tool in creating an economic, social and societal innovation impact.

When questions from customers and partners become more specific, it often occurs that the follow-up research is longer conducted in conjunction with third parties, and that contract research is used instead to create customised solutions with greater exclusivity than Shared Research, the cost of which is 100% covered by the customer. Through this process, TNO brings parts of its research increasingly closer to the market, while also actively transferring its knowledge through spinouts or licences.

Technology Transfer is the final step in TNO's innovation cycle. During this stage, TNO markets research in the form of licensing agreements, spinouts, and specific innovation solutions licensed to customers and partners. In using these four consecutive stages – also known as 'valorisation' – TNO creates substantial value.

You will find more information about our procedures on TNO.nl. You will also find more information there about the use of our patents and our investigative programmes.

Furthermore, TNO fulfils its role as an innovator in a special manner on behalf of the Ministry of Defence, the Ministry of Social Affairs and Employment and the Geological Survey of the Netherlands. This involves the delegation to TNO of knowledge-intensive government duties related to defence & security, labour participation, and the Geological Survey.

There is also a separate Innovation for Development programme in place, which focuses on using innovations in the developing world.

PROGRESS IN EARLY RESEARCH PROGRAMS

Through a series of Early Research Programs, TNO is conducting new research in order to enhance its technology position, through which, together with its research partners and stakeholders, it makes an important contribution to solving various challenges in society. The research portfolio is dynamic and comprises around ten programmes with a number of specific designs, also known as 'germs'.

A successful programme focuses on achieving a distinctive position for TNO and, over a period of three to four years, it develops impact and economies of scale through cooperation and co-investment with research partners and stakeholders, preferably in an ecosystem yet to be developed and managed on a programme basis. The technology positions developed are all given their own place in TNO roadmaps, where they will continue to be developed, utilised and exploited in demand-driven programmes, public-private partnership projects, contract research, licences and spinouts. The transfer of the research activities of Early Research Programs to roadmaps creates room each year for the start of several new 'germs'.

RESULTS OF EARLY RESEARCH PROGRAMS 2017

- The Early Research Programs comprise ten topics related to the comprehensive nature of the TNO technology portfolio, including quantum technology and nanotechnology, the structural integrity of overpasses, management of driverless vehicle and vessel technology, personalised lifestyle advice, Organ-on-a-Chip technology for a healthier lifestyle, big data, Complexity Science, as well as energy storage and material research.

- A total of four investigations/germ projects were conducted for the topics of artificial intelligence, human-robot interaction, bionanotechnology for fast characterisation of proteins and DNA, as well as laser-satellite communications in order to facilitate new technologies such as the Internet of Things.
- The research results generated have been recorded and published in approximately 60 patents, 140 scientific publications, 115 presentations given at conferences, and 15 symposiums specifically aimed at the distribution of Early Research Programs, including the third annual event devoted to 3D nanotechnology and featuring speakers from IBM, ARCNL and Johns Hopkins University (Delft campus), the second annual Organ-on-a-Chip event, organised with the cooperation of hDMT¹ in Leiden and the final presentation of the 'Human Enhancement' programme at the Spant! theatre in Bussum, North Holland province.
- The research results generated as part of the 3D nanotechnology programme was used to establish a spinout: Nearfield Instruments BV, which managed to secure a substantial investment from Samsung Electronics within one year; Samsung Electronics is one of the largest players in the semiconductor industry.
- For these programmes, we are currently working with the Netherlands Organisation for Scientific Research (NWO), virtually all Dutch, and several international, universities, virtually all Top Sectors, the National Science Agenda (NWA) start-up incentive programmes, and with numerous Dutch and international research and educational institutions and companies. In six of our programmes, we have seen an increase in the number of research ecosystems (programme-directed): QuTech (Delft campus), the Brightlands Materials Centre (Chemelot Campus), the NOMI (Nano Opto-Mechatronics Instruments) partnership with the Eindhoven University of Technology High Tech Systems Centre, the i-Botics initiative with Twente University, partnership related to metabolic health and lifestyle with LUMC (Leiden campus) and the Big Data Value Centre.

1. The Institute for human Organ and Disease Model Technologies.

PROGRESS OF TECHNOLOGY TRANSFER

TNO launched the Technology Transfer Program in order to market more innovations more quickly. Technology Transfer is a key part of the valorisation and value creation process and concerns the transfer of technology to the market by granting a licence to an existing company or establishing a new company (i.e. a spinout). This ensures that TNO technologies are developed into innovative products and services in the market, thereby resulting in an activity and high-quality employment.

The programme is funded with the proceeds of the partial sale of TNO Bedrijven. The programme provides employees with the room and support to create a business case and business plan for high-potential innovations and to validate these in the market. Where necessary, financing is available to enhance the intellectual property position (IP) and thereby create a more attractive proposition for investors.

A Tech Transfer team and a Tech Transfer Board have been created in order to improve the deal flow from the TNO organisation as a whole. The Tech Transfer Team is available to provide advice and support related to intellectual property position (IP) assessment, licensing, new business development, venturing, marketing, business law, labour issues, financing and property (real estate). The appropriate support ensures that the best route to the market is determined for the innovation in question. The objective is to successfully launch the innovation in the market within one year by granting a licence to an existing company or establishing a spinout.

RESULTS OF TECHNOLOGY TRANSFER 2017

A total of 27 teams participated in the programme in 2017. This has resulted in five spinouts, two licences, and one proposition which has since been discontinued. The remaining teams will continue to prepare their spinout in 2018.

Through these initiatives, TNO is investing in the preparatory stage of spinouts, but not in the new companies themselves. The Tech Transfer team invested heavily in 2017 in building relationships with investment funds and informal investors. For example, TNO and three technical universities co-founded a new high-tech investment fund with a budget of EUR 75 million, known as 'Innovation Industries'. This fund invested substantially in a TNO spinout immediately upon its establishment: together with Samsung, a total of EUR 10 million was invested in [Nearfield Instruments BV](#).

TNO SPINOUT: TILEDMEDIA

One of the TNO spinouts in 2017 is Tiledmedia, a leader in high-resolution virtual reality and 180-degree content for personal devices. For more information about Tiledmedia, see: <http://tiledmedia.com/index.php/about-us/>

FINANCIAL MODEL

TNO is a not-for-profit research institution. For the continuity of operations, it is important that the expenses incurred by the organisation are covered and that a (limited) profit is generated for the purpose of investments, continuity in research development, and to ensure a healthy capital position.

The Early Research Programs and the Shared Innovation programmes are always partially or fully funded from public sources. The expenses incurred by TNO in these programmes are reimbursed. The expenses associated with public programmes from entities outside the government, e.g. participation in the EU's Horizon2020 programme, are only partially reimbursed. In order to participate in these types of programmes, TNO must match these expenses with the available resources from government funding. This means that financial returns can only be generated from Technology Transfer through contract research, spinouts or licensing agreements.

The further development of research results for application in the market tends to be costly. Active management of the sharing of knowledge, value creation and valorisation management is therefore necessary in order to ensure the continuity of the organisation.

STRATEGY 2015-2018 AND STRATEGIC PLAN 2018-2021

The year 2017 was the penultimate year of the original strategic period 2015-2018. The new Strategic Plan 2018-2021 was published a year earlier at the request of the Minister of Economic Affairs, with the objective of bringing it more in line with the two-year renewal cycle for research and innovation contracts with the Top Sectors. The new strategy is also compatible with the shared strategic framework of all institutions for applied scientific research in the Netherlands.

RESULTS OF STRATEGIC PLAN 2015-2018

The Strategic Plan 2015-2018, which bore the name *'Trends, Transitions, TNO'* set out three strategic objectives. The main results for each objective are shown below.

Objective: TNO as a nationally and internationally recognised organisation based on five transitions

Results:

- Focus on large-scale partnerships (public-private partnerships): Joint Innovation Centres: nine achieved; pipeline of initiatives.
- High customer satisfaction: 4.2 (on a 5-point scale).

Objective: Accelerating the transition from high-quality research to practice on a multidisciplinary basis

Results:

- Development of Technology Transfer: structure of the programme now completed; annual number of spinouts created.
- Knowledge Position Audit (KPA): continuously high score.

Objective: Creating a healthy and vital organisation

Results:

- Focus programme: process and efficiency improvement.
- Focus on vitality and engagement on the part of employees: Employee Satisfaction Survey.

NEW STRATEGIC PLAN 2018-2021:

'FLYWHEEL OF INNOVATION IN THE NETHERLANDS'

The new Strategic Plan 2018-2021: *'Flywheel of Innovation in the Netherlands'* was presented in April to the Minister of Economic Affairs, who is the TNO treasurer on behalf of the government.

The strategy was established based on close communication with customers and other external stakeholders, including the Strategic Advisory Councils, professional departments, Top

Sectors and research partners. In addition, discussions have been held across the entire TNO organisation in order to involve employees in the strategy-formation process. Based on this comprehensive stakeholder engagement, we are building a solid foundation for the future.

OUTCOMES OF TO2 EVALUATION INCORPORATED

The results of the TO2 evaluation have also been incorporated into the new strategy. Along with the other organisations for applied research, TNO presented the TO2 Strategic Framework 2018-2021 to the Minister of Economic Affairs as part of the TO2 federation. In this framework, the organisations for applied research respond in broad outlines to the recommendations made by the Schaaf Evaluation Committee, which presented its report on organisations for applied research in early 2017. The Committee referred to the quality and impact of the TO2 organisations as 'excellent' across the board, but did point out the vitality of the institutions which have come under pressure in recent years as a result of the decreased government funding.

CHANGE IN TREND FROM THE PAST

This recommendation and the plea by the Research Coalition directed to a new government for an additional annual investment in research and innovation potentially resulted in a coalition agreement in 2017, with a total of EUR 200 million being consistently invested in fundamental research and EUR 200 million in applied research. TNO is obviously delighted with the clear change from the trend of the past of shrinking budgets for innovation.

In August, the Advisory Board for Science, Technology and Innovation (AWTI) issued its recommendation ('Essential Links') regarding applied research in the Netherlands. This report once again makes the recommendation to substantially invest in applied research of a mission-driven nature. On completion

of the formation of the new government, the newly instated Minister of Economic Affairs stated in his response to the TNO Strategic Plan 2018-2021 that he would respond to all recommendations issued.

COMMITMENT BY TNO

At the end of 2017, TNO – based on the resources currently available – disclosed its commitment to the research and innovation contracts for the Top Sectors for the years 2018-2019. As shown in the underlying research agendas, TNO seeks to link its objectives to the various social challenges facing the professional departments.

Finally, TNO sold its majority stake in TNO Bedrijven in 2017 and, in association with the four Universities of Technology in the Netherlands, forged alliances with several valorisation partners and funds. Existing ties with Startup Delta were strengthened at the same time, and internally the policy for Technology Transfer and the attendant creation of new high-quality employment in start-ups has been intensified.

DEVELOPMENTS IN EUROPE RELEVANT TO TNO

Within Europe, the EU Horizon 2020 research programme remains of vital importance to TNO, Dutch society and TNO's research partners. This enables TNO to respond to this programme and, together with its partners, contribute more substantially to innovativeness in the Netherlands. The likelihood of the proposals submitted by TNO being accepted is far above the European average, and one-third of the participating Dutch companies actively work with TNO.

TNO works closely with its research partners EARTO and Nerth-ER in contributing to the new framework programme. This ninth European framework programme for research and innovation will succeed the Horizon 2020 programme. The focus will be on the importance of cooperation with international partners, particularly the industrial partners, the Key Enabling Technologies and the essential role played by the various forms of public-private partnerships (HPC cPPP, JTIs and EIT-KIC).¹

1. HPC cPPP = High Performance Computing contractual Public-Private Partnerships.

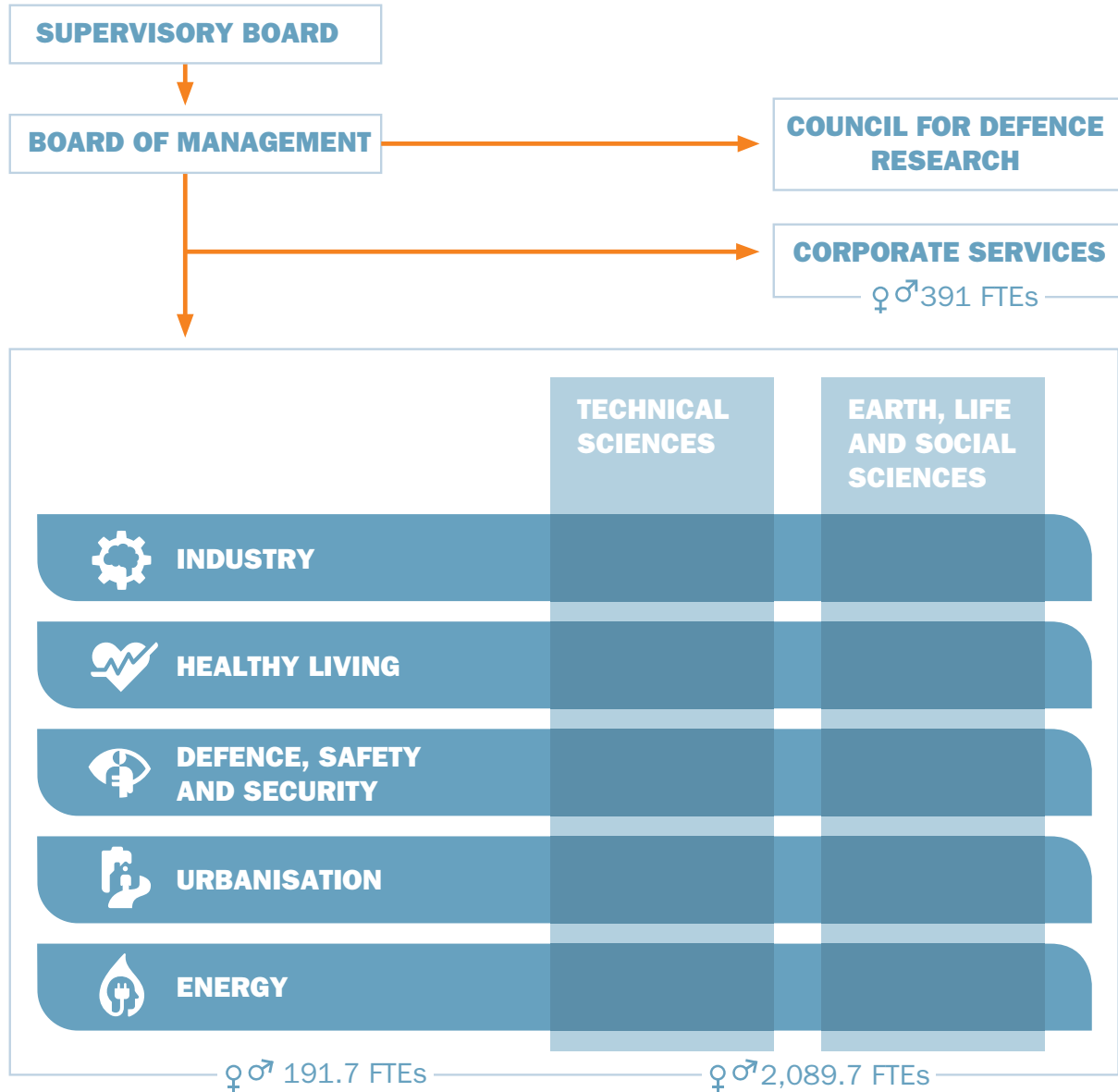
JTIs = Joint Technology Initiatives.

EIT- KIC's = European Institute of Innovation and Technology met betrokken Knowledge and Innovation Communities.

TNO ORGANISATION

TNO was a matrix organisation in 2017 operating along two axes. There was an axis comprising researchers, consultants and project managers divided into two expertise areas: Technical Sciences and Earth, Life & Social Sciences (approx. 2,089 FTEs). The other axis consisted of five domains of expertise based on the five social transition areas selected to which TNO contributes (191.7 FTEs). This is supported by the Corporate Services (391 FTEs).¹

The section titled 'Corporate Governance' on page 14 provides further information on the role of the Board of Management, Supervisory Board and Council for Defence Research.



1. FTEs at year-end.

CORPORATE GOVERNANCE

TNO was established under Dutch law and connects people and research based on its independent and impartial position. The organisation adopts an objective attitude in developing practical innovations to serve the general interest, society and the corporate sector.

STANDARDS FOR GOVERNANCE AND SUPERVISION

Corporate governance refers to the totality of rules, standards and institutions devoted to the administrative structure of the organisation. These standards, institutions and rules help to ensure that the organisation acts under adequate supervision, with integrity, responsibility, and transparency.

The structure of the corporate governance system is based on the TNO Act 1930, in addition to being bound by the *Code of Conduct for TO2 organisations*, as included in the government's *Vision of Applied Research published by the government*, to the *Shared Framework of Standards for Financial Management* and the *Regulation of Semi-Governmental Organisations*.

TNO's objective is to adapt research results for businesses and governments. Based on these two perspectives, TNO believes it is important to also follow a governance code which applies to businesses (*Corporate Governance Code 2016*) and a governance code applicable to governments (*Corporate Governance Code for Public Service Providers 2015*) in organising TNO's corporate governance system, even though TNO is not legally bound by these codes.

In order to ensure ethical conduct and transparency in the organisation, TNO maintains a Code of Conduct (the 'TNO Code'), internal and external complaints procedures, and a policy for reporting presumed malpractice. This Code of Conduct and policies were drafted in view of the above-mentioned governance codes, the Netherlands Code of Scientific Practice, and relevant laws and regulations.

The regulations of TNO, the Board of Management, the Supervisory Board, the Council for Defence Research, the Strategic Advisory Councils, and the Works Council, along with the Mandate document, make up the TNO organisational

regulations. These organisational regulations describe the mutual responsibilities, authorisations and obligations. The Mandate document carefully outlines the authorisations granted within the organisation. Adequate checks and balances are guaranteed as part of careful decision-making preparation through the system of internal approvals and recommendations. TNO conducted a full update in 2017 of its organisational regulations. The new versions of these documents are expected to become valid in early 2018.

BOARD OF MANAGEMENT

The Chairman and members of the Board of Management are appointed by the Crown. The remuneration they receive is consistent with the Dutch Standard for Remuneration Act (WNT).

The Board of Management is tasked with governing TNO and is responsible, among other things, for defining and achieving the objectives, policy, strategy and the results arising therefrom. In accordance with the TNO Act 1930, the Board of Management has a collegial governance model, whereby the board members are collectively and fully responsible. In addition to the chairman, each board member acts in accordance with their own strategic/scientific, operational or financial profile.

SUPERVISORY BOARD

The chairman and members of the Supervisory Board are appointed by the Crown for a 5-year term. Both the chairman and the members can be reappointed once. The remuneration they receive is in accordance with the Dutch Standard for Remuneration Act (WNT).

The Supervisory Board is tasked with overseeing the policies set by the Board of Management and their implementation, and with supporting the Board by providing advice. Supervision relates, in particular, to risk management and compliance and extends,

in this context, to the achievement of objectives and Key Performance Indicators, the strategy, the annual plan (including a plan for investments), financial reporting and compliance with laws and regulations. The TNO Act 1930 sets out what decisions of the Board of Management require the approval or agreement of the Supervisory Board.

The Supervisory Board evaluates its own performance and that of its members and committees on an annual basis. The Board conducts individual performance reviews with the chairman and with the individual members of the Board of Management. There are a total of three committees operating within the Supervisory Board: the Selection and Remuneration Committee, the Audit Committee and the Quality Assurance Committee. These committees are tasked with duties defined more closely by the Supervisory Board. There are regulations in place for these committees. The Selection and Remuneration Committee details HR issues for the Supervisory Board. The Audit Committee provides the Supervisory Board with the option to, based on its responsibility, increase the supervision of finances and risk management of TNO. The Quality Assurance Committee supports the Supervisory Board in supervising the strategic policy and the quality of the primary process.

The financial statements include a statement regarding their accuracy, issued by an audit firm appointed by the Supervisory Board. The audit firm KPMG audited the financial statements from 2011 to 2017. EY will be auditing the financial statements from 2018 onward. The audit firm will also conduct a separate audit with regard to the lawful/legal collection and expenditure of the government funding received based on the audit protocol agreed between TNO and the Ministry of Economic Affairs.

COUNCIL FOR DEFENCE RESEARCH

TNO's policy for the Defence division of TNO is set by the Council for Defence Research (RDO), pursuant to the TNO Act 1930. The Chairman of the Council for Defence Research is appointed by the Crown on the recommendation of the Minister of Defence, who is also a member of the Board of Management.

An effective Dutch military must continuously innovative its military capabilities in order to remain ahead of adversaries and potential adversaries. This calls for scientific support in a large number of research and technology areas. A portion of this research is so defence-specific that the Ministry of Defence must provide for this itself. The Council maintains a strategic partnership with TNO in this context. TNO has carried out the bulk of the applied scientific defence research in the Netherlands since 1947. In doing so, it works closely with the Ministry of Defence, companies and other research and educational institutions. Defence and public safety together make up a closely intertwined ecosystem. The fact that TNO also works for other customers in the defence and security domain enhances and expands the defence knowledge base as well as keeping expenses in check for the Ministry of Defence.

EMPLOYEE REPRESENTATION

The two employee representative bodies at TNO are the Works Council and the Sub-Committees. The members of the Works Council are elected by the TNO employees. The Works Council handles all cases which are relevant to employees in general and to TNO as an organisation, and provides advice on this basis (both solicited and unsolicited) to the Board of Management. In key areas, the Works Council has the right of approval in accordance with the Dutch Works Council Act (*Wet op de ondernemingsraden*). The Sub-Committees discuss with the Managing Directors Expertise any business relevant to the Expertise Areas.

STRATEGIC ADVISORY COUNCILS

A Strategic Advisory Council (SAC) consists of leading individuals from the business community, the government and research and educational institutions. These members are appointed by the Board of Management, after being nominated by the issue management, for a period of three years. From the year 2018 onward, the appointment period will be the same as the period for TNO's Strategic Plan.

TNO is structured as a project organisation divided into different focus domains (= areas of specialisation). A Strategic Advisory Council has been added to each of these domains, who are authorised to give advice regarding prioritisation and a choice of strategic focus areas related to the domain in question. The SAC identifies external developments related to the domain in question and shares these with the management for that particular domain.

The Strategic Advisory Councils convene twice a year; these meetings are attended by a member of the Board of Management.

The chairs of the Strategic Advisory Councils are invited at least once a year by the Board of Management. Topics discussed include strategic decisions in roadmaps and developments related to applied research.

The division of TNO into different domains will be changed to a vertical unit structure commencing in 2018; the organisation of the Strategic Advisory Councils will be adjusted accordingly at the same time.

DIRECT SUBSIDIARIES OF TNO

TNO sold its majority stake in TNO Bedrijven B.V. (currently trading as First Dutch Innovations B.V.) to a private equity firm in 2017. This also prompted TNO to restructure its investment portfolio.

TNO has transferred its participating interests to three holding companies: TNO Tech Transfer Holding B.V., TNO Affiliates Holding B.V. and TNO International Holding B.V. TNO Tech Transfer Holding B.V. is a private equity company which manages mainly minority stakes in spinout companies. This also includes the participating interests of First Dutch Innovations B.V.

The transfer of a spinout is a business transaction, in which TNO is mindful of equality and transparency. For each of the participating interests managed under TNO Tech Transfer Holding B.V., TNO is not involved in the day-to-day business operations. Furthermore, TNO agrees to market-level terms with these spinout companies, including when allowing access to TNO facilities or providing licences for the use of intellectual property rights (including patents and knowhow) vested in TNO. TNO Affiliates Holding B.V. owns shares in other Dutch entities, not including spinouts. Based on reasons of transparency, or partnerships with third parties, these entities have been placed at arm's length from TNO. TNO is generally more actively involved in the day-to-day business operations of these entities than is the case with participating interests overseen by TNO Tech Transfer Holding B.V.

TNO International Holding B.V. owns shares and similar interests in TNO sites based in countries other than the Netherlands. These sites were established due to reasons of transparency or risk management.

REPORT OF THE SUPERVISORY BOARD

The Supervisory Board generally convenes at several TNO sites, and during these company visits in 2017 its members learned about highly diverse and inspiring innovations. The Supervisory Board is impressed by the enthusiasm and expertise of TNO's employees, who continue to strengthen TNO's role with a great passion for their professional fields.

TOPICS DISCUSSED

A number of key changes were defined for TNO in 2017. The supervision during the year focused mainly on:

- The finalisation of the sale of TNO's majority stake in TNO Bedrijven B.V. to First Dutch Companies and the sale of subsidiary TASS (from the portfolio of the former TNO Bedrijven) to Siemens.
- The establishment of a new TNO organisational structure. The current matrix structure will be abandoned in 2018 and replaced with a structure with nine market-oriented units. The Supervisory Board focused in particular on the criteria and choices in the formation of the new structure and consistency with the strategic principles of the organisation.
- The establishment of a new energy research centre as part of TNO, in which the sustainable energy operations of the Energieonderzoek Centrum Nederland (ECN) are combined with the TNO Energy Survey. This partnership is scheduled to be finalised in early 2018.
- TNO has also integrated its nutrition research with the activities of Wageningen University, and as of 1 January 2018 these operations will be part of Wageningen University & Research (WUR), under the name Dutch Food Initiative.
- The Supervisory Board is closely involved in developments related to T02.
- The Supervisory Board approved the 2016 financial statements on 15 March 2017; on 13 December 2017, it approved the 2018 budget.
- As part of the evaluation of the Board of Management and the Board's individual members, the Supervisory Board conducted annual performance reviews with the chairman and members of the Board of Management.
- The Supervisory Board conducted the annual evaluation of its own performance, supervised by an external agency.

INDEPENDENCE AND IMPARTIALITY

In the opinion of the Supervisory Board, the requirements for independence and impartiality as referred to in articles 2.1.7-2.1.9 of the Dutch Corporate Governance Code 2016 have been complied with.

MEETINGS

The Supervisory Board held five regular meetings in 2017; in addition, one extra meeting was held in relation to the decision-making process regarding ECN's sustainable energy activities. Furthermore, there were five closed meetings. The Audit Committee convened on three occasions, while the Selection and Remuneration Committee and the Quality Committee each convened on two occasions.

The various committees communicated with each other where necessary outside the meetings. The Chairman of the Supervisory Board and one of the members attended a Works Council meeting twice, in addition to regular meetings with the Ministry of Economic Affairs.

Due to illness of Ms Lamse-Minderhoud the Audit Committee of the Supervisory Board received counsel from an external financial advisor, Mr P.H.J.M. Visée.

MEMBERS OF THE SUPERVISORY BOARD

Dr. C.A. Linse, Chairman (1949)

In office since 1 March 2011

Management and supervisory positions:

- Supervisory Board member, AKZO Nobel Nederland B.V.
- Supervisory Board member, MRC Global Inc. Houston
- Chairman of MER Committee
- Chairman of the Supervisory Board, LUMC, Leiden
- Chairman of the Supervisory Board, Museum Het Grachtenhuis, Amsterdam

I.H.J. Vanden Berghe (1962)

In office since 1 February 2011

Management and supervisory positions:

- General Administrator, National Geographic Institute
- President, Eurogeographics
- Member of the Board of Administrators General of the parastatal organisations
- Chair of the G-Cloud Strategic Board of the Federal Government
- Visitor Professor at Catholic University of Leuven
- Director of Flemish institute for Technological Research (VITO)
- Member of the Management Committee of the Royal Museum for Central Africa (Tervuren, Belgium) and the Royal Institute for Natural Sciences

J.M. Bensing (1950)

In office since 1 September 2008

Management and supervisory positions

- Professor Emeritus since 1 April 2015
- Emeritus Honorary Research Fellow, Netherlands Institute for Health Services Research (NIVEL)
- Professor Emeritus at Utrecht University, Department of Social Sciences
- Member, Royal Netherlands Academy of Sciences (KNAW)
- Deputy Chair, Supervisory Board, Netherlands Consumers' Association
- Deputy Chairman, Supervisory Board, Flevoziekenhuis Hospital
- Deputy Chairman, Supervisory Board, Twente Medical Center
- Member, Supervisory Board, De Hoogstraat convalescence home
- Member, Supervisory Board, Waarborgfonds van de Zorg (WfZ)
- Auditor for the accreditation of directors of healthcare institutions (NVZD)
- Member, Evaluation Committee, Health Council of the Netherlands

I.G.C. Faber MBA (1968)

In office since 1 October 2009

Management and supervisory positions:

- Chief Executive Officer, Pooling Partners/Faber Halbertsma Groep
- Member, Supervisory Board, Jaarbeurs Utrecht
- Member, Supervisory Board, Probos

P.J.M. van Laarhoven (1959)

In office since 1 October 2016

Management and supervisory positions:

- Board chairman, Centrum Wiskunde & Informatica
- Member, Strategic Logistics Platform (Logistics Top Team)
- Chairman, Supervisory Board, CQM
- Chairman, Supervisory Board, Havenbedrijf Moerdijk

J.D. Lamse-Minderhoud RA (1969)

In office since 1 July 2013

Management and supervisory positions:

- Member, Management Board, PricewaterhouseCoopers Nederland (PwC) and EMEA Human Capital leader
- Member, PwC Executive Team

P.P.C.C. Verbeek (1970)

In office since 1 May 2012

Management and supervisory positions:

- Lecturer, Philosophy of the Human Being and Technology, University of Twente
- Co-director, University of Twente DesignLab
- Honorary Professor Adjunct, Aalborg University
- Member of UNESCO World Commission on the Ethics of Science and Technology (COMEST)
- Member, National UNESCO Committee in the Netherlands
- Board member, Rathenau Instituut
- Member, NWO programme board for Socially Responsible Innovation
- Member, Council for the Humanities, Royal Netherlands Academy of Sciences (KNAW)
- Member of the Centre for Ethics and Health (partnership between the Health Council of the Netherlands and the Council for Public Health and Society)
- Member of the Editorial Board, SATS. Journal for Northern Philosophy, and Philosophy & Technology

The term for Mr P.P.C.C. Verbeek is extended in 2017.

J. Hoegge, secretary (1969)

In office since 15 October 2014

REPORT OF THE COUNCIL FOR DEFENCE RESEARCH

The world remained an unsafe place in 2017, and security therefore remained a key priority in the Netherlands and abroad, as well as being one of the main issues covered by the Coalition Agreement. The additional funds allocated by the new government for defence will reach EUR 1.5 billion in 2021. This is in addition to the amount of EUR 400 million allocated towards improving the safety of society, of which law enforcement agencies in the Netherlands are among the beneficiaries. The EU defence partnership made progress in entering into a permanent, structured partnership related to security and defence policy (PESCO), while in terms of research a proposed European defence research programme (EDRP) foreshadowed the ninth EU Framework Programme. For the Council for Defence Research, 2017 was largely about preparing for the role played by TNO's Defence division in these developments.

As part of a long-term strategic partnership, the bulk of the defence research in the Netherlands has been carried out at TNO since 1947. Pursuant to the TNO Act 1930, the Council for Defence Research is responsible for defining the policy for TNO's Defence division. This is related to the fact that an effective Dutch military must continuously innovate its military capabilities and, as such, requires scientific support in a large number of research and technology areas. Some of these areas are so defence-specific that the Ministry of Defence must itself ensure that this research will become available. This occurs in close partnership with the government, companies and other research and educational institutions. Defence and social security are closely entwined. In addition to defence, the partnership with the Ministry of Justice and Security has also gained significance. Innovation research by TNO on behalf of other customers in the defence and security domain thereby extends the defence knowledge base and ensures that the costs for Defence remain affordable. One of the members of the Board of Management is appointed by the Crown on the nomination of the Minister of Defence and also serves as the Chairman of the Council for Defence Research (in which defence representatives hold the majority of the seats).

APPROVAL OF NEW TNO STRATEGIC PLAN 2018-2021

In the new TNO Strategic Plan 2018-2021, the components related to the Defence division were coordinated directly with the Council for Defence Research. The priorities set in the plan are in line with the strategy of the Council for Defence Research. In the new organisational structure, the Defence division was designed as an integrated Defence, Safety & Security unit. In accordance with the desire of the Council for Defence Research, the portal role for Defence was also extended.

Continuous innovation will be crucial to the military of the future, and intensification of research development forms an essential component of this. In the wake of the 'Recalibration of the Defence Research Portfolio' implemented in 2016, TNO and the Ministry of Defence prepared for this together with its research partners NLR and MARIN. Key research topics were identified and initial implementation plans have been drafted. These plans will be finalised in 2018, and the intensification and renewal of the knowledge base will be further specified. In anticipation of this, a new programme was launched in 2017 for high-risk explorative research, through which the initial results have already been achieved in areas ranging from autonomous systems, artificial intelligence and big data to quantum technology, innovative protective materials and precision weapon systems.

Based on this same aim for renewal and innovation, the Council for Defence Research has also allocated capital reserves for innovative research focusing on areas such as laser weapons and fighting hybrid threats.

STRATEGIC RELATIONSHIPS WITH THE MINISTRY OF JUSTICE AND SECURITY AND THE POLICE

Key progress was made in the strategic relationships with the Ministry of Justice and Security and the Police. The Ministry of Justice and Security made the first new funds available for research development in 2017. Several new target financing programmes were launched, aimed, among other things, on cyber security, the future of emergency centres, and the related reporting procedures, along with satellite applications in the domain of the Ministry of Security and Justice. The National Police, in turn, is reflecting on 'The police of the future'. The role and organisation of research and innovation at law enforcement agencies and the way in which TNO might be able to provide support were the subject of a fertile

discussion with the police management, and this process will be further developed in 2018. Shared research efforts by Police and the Ministry of Defence form part of this and are currently being developed in programmes related to cyber threats and information.

DEVELOPMENTS RELATED TO TOP SECTORS AND THE SOCIETAL CHALLENGE OF A SAFE SOCIETY

TNO and the professional departments of Defence and the Ministry of Security and Justice made joint efforts in the developments related to Top Sectors and the 'Safe Society' Societal Challenge. This also applies to the EUR 200 million on an annual basis released under the Coalition Agreement for applied research. The objective is to strengthen both the defence and the security research basis and the position of the Dutch defence and security industry.

IMPLEMENTATION OF INTERNATIONAL STRATEGY

The International strategy approved in 2016 was implemented through the intensification of intergovernmental cooperation, participation in programmes and projects of international organisations such as NATO, the European Union and the United Nations, along with assignments for foreign governments and companies. Within the Preparatory Action on Defence Research (PADR), which paves the way for the new European Defence Programme (EDRP), TNO has positioned itself by securing the participation in a partnership project for maritime situation awareness. The groundbreaking SMART partnership with Norway related to CBRN protection (chemical, biological, radiological and nuclear) and related to satellites is starting to take shape. In addition, the future of the TNO Branch Office in Singapore was a focus of attention for the Council for Defence Research.

FACILITIES AND ACCOMMODATION OF THE DEFENCE DIVISION

A fundamental part of the future vision for the defence and security research is the large-scale activities in facilities and accommodation of the Defence division. The construction projects in Ypenburg and The Hague Waalsdorp went according to schedule. A state-of-the-art, renovated building will become available in Waalsdorp in the near future. Although the Ypenburg site is currently still a building site, this will result in the future in new state-of-the-art facilities for research into, among other things, directed energy weapons and for ballistic testing of complete vehicles. Decisions will be made in 2018 regarding the future of the Rijswijk site and the CBRN survey.

MULTIPLE EVENTS

The events of various sizes organised this year included the successful celebration of 70 years of Defence Research in the National Military Museum and the annual Innovation in Defence Day, while, for example, the Nederland Radarland Theme Event underscored the potential and importance of systematic research development through the years. Finally, as before, there were a number of successful innovative research programmes and high-impact projects in the Netherlands and abroad.

On behalf of the Council for Defence Research,
Wim Nagtegaal, Chairman

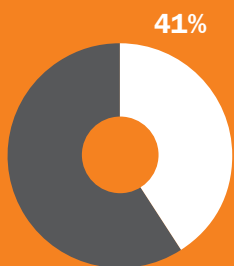
MEMBERS OF THE COUNCIL FOR DEFENCE RESEARCH

-) W. (WIM) NAGTEGAAL, CHAIRMAN
-) MR. M. (MARC) GAZENBEEK, DEPUTY CHAIRMAN
-) H.G. (HENK) GEVEKE
-) GENMAJ E. (ERIC) SCHEVENHOVEN
-) A.P. (AUKE) VENEMA
-) M.PI. (MAARTEN) MANDERS, SECRETARY

KEY FINANCIAL DATA 2017

TNO'S REVENUE (INCL. GOVERNMENT FUNDING)

€ **426** MILLION



41% Contribution from the national government
€ 176 million
Private-sector and public-sector contracts
€ 250 million



GOVERNMENT FUNDING

€ **159** MILLION*



2016
€ 159 million*
Change compared to 2016 € 0 million
0.0%

* Excluding EUR 17 million VAT offset on account of lower advance tax deduction starting in 2016.

DOMESTIC REVENUE

€ **156** MILLION

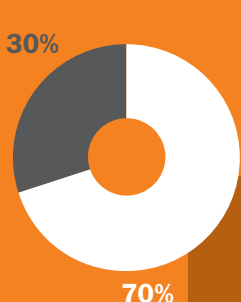


48% Private sector
€ 81 million
Public sector
€ 75 million



INTERNATIONAL REVENUE

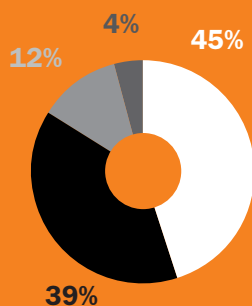
€ **94** MILLION



30% Private sector
€ 66 million
International Organisations
€ 28 million



TNO'S REVENUE BY RESEARCH TYPE



45% Private sector and public sector contracts
€ 191 million
Public-private partnerships & programming
€ 164 million
Regular and target funding
€ 53 million
Early Research Programs
€ 18 million

FINANCIAL SUMMARY

The operating result of the TNO Organisation for 2017 was a meagre EUR 0.5 million.¹ It was a financially challenging year for a number of reasons. The number of orders, in addition to being disappointing, was also unevenly distributed among the research groups. An increase in the level of investments lead to an increase in non-deductible VAT. Finally, the Council for Defence Research made the decision to finance research projects using reserves accumulated from prior years.

NOTES ON THE SALE OF THE MAJORITY STAKE IN TNO BEDRIJVEN

In addition to this operating result, TNO posted special incidental earnings from participating interests of EUR 57.8 million, causing comprehensive income to reach EUR 58.3 million². This unique and nonrecurring profit was generated mainly by the proceeds of a sale of 55% of the shares in TNO Bedrijven (which has since been renamed First Dutch Innovations), combined with the full sale of subsidiary TASS, part of the portfolio of the former TNO Bedrijven. A number of guarantees and exemptions were agreed in this sale. Because no provisions have been made for these guarantees and indemnities, the sale proceeds should not yet be considered completely available. In addition to these one-off profits, First Dutch Innovations generated strong annual profits (45% of which are recognised under 'Result from participating interests') and a result was posted on the recapitalisation of the recently established TNO spinout Nearfield.

TNO Bedrijven was established 30 years ago to further develop TNO activities which were past the stage of applied research and had begun to assume a repetitive character, and to facilitate investments in TNO technologies where the opportunity was not yet picked up by the 'regular' market because of its risk profile. In other words, the main objective of TNO Bedrijven was to valorise and market high-quality research which had not yet been embraced by the corporate sector. The nonrecurring earnings from the sale of the investment in TNO Bedrijven and the fact that the 27 small and medium-sized enterprises in which the majority stake was sold employed approximately 1,100 people shows that TNO succeeded in doing this over the past 30 years. TNO decided to sell the majority stake in order to further establish the financial and commercial strength of TNO Bedrijven. After a tendering process, TNO found a buyer in the experienced Rotterdam entrepreneur Peter Goedvolk.

Both the existing portfolio and start-ups, following the sale of the majority stake and under the new name First Dutch Innovations, gained improved access to borrowed capital and market expertise. This enables the companies to start effectively and to grow into innovative companies with impact in the market. TNO intends to keep the strategic minority interest in First Dutch Innovations, while at the same time focusing even more strongly on other investors. The first steps to this end were taken in 2017 with the stake in the 'Innovation Industries' investment fund. Other participants include three universities of technology. Innovation Industries made an initial investment of EUR 5 million in TNO spinout Nearfield. Samsung Venture Investment Corporation has also invested in Nearfield. This represents a good example of the closer partnership with other investors.

Investment in one-off proceeds from Technology Transfer

The nonrecurring book profit from the sale of TNO Bedrijven will be used mainly for one of the main objectives of TNO, the valorisation of high-quality research which has not yet been embraced by the corporate sector, including bringing it to market through spinouts. The Minister of Economic Affairs and Climate Policy already advised Parliament on this in a letter dated 18 August 2016.

TNO and the Ministry of Economic Affairs and Climate Policy agreed in 2017 that 50% of the book profit from the sale of TNO Bedrijven would be used for the Technology Transfer programme. The decision to use these proceeds largely for this purpose was made because there is no room for these investments in TNO's regular business operations and financing structure. TNO facilitates this transfer of research results to the market mainly through the Tech Transfer programme launched in 2017, which has an annual target of a minimum of 10 small and medium-sized start-ups (spinouts) and accounted for five spinout companies in 2017. TNO will reinvest the proceeds eventually

1 Result from regular operations before taxes $-/-$ 455K + corporation tax gain 976K = rounded off + EUR 0.5 million. See the [non-consolidated financial statements](#).

2 Result participating interests 57,794K = EUR 57.8 million rounded off. See the [non-consolidated financial statements](#).

generated by the new companies in order to generate long-term growth and employment. A portion of the remaining funds has been set aside, as approved by the Ministry of Economic Affairs and Climate Policy, for the proposed acquisition of the sustainable energy research operations of Stichting ECN and, therefore, for a long-term boost of the innovativeness related to sustainability. The portion of the nonrecurring book profit which has been set aside for guarantee obligations will, if these obligations are cancelled, also be invested in innovative activity and employment.

NOTES ON THE FINANCIAL STATEMENTS

Profit

TNO earned a profit of EUR 58.3 million in 2017 (versus EUR 14.1 million in 2016). This profit includes earnings from participating interests of EUR 57.8 million, as specified above.

The decline in consolidated revenue and consolidated expenses are mainly the result of the deconsolidation implemented in 2017 of the former majority stake in TNO Bedrijven.

NOTES ON THE COMPANY FINANCIAL STATEMENTS

Revenue

Company revenue fell from EUR 430.7 million in 2016 to EUR 425.6 million in 2017. This was mainly the result of the uneven distribution of the amount of work within the research groups while the number of orders was decreasing at the same time. As a result, partial reorganisations were implemented in several organisational units.

Each EUR 1.00 received in government funding (excluding VAT compensation) in 2017 was offset by an average of EUR 1.60 market revenue (identical to 2016).

Operating expenses

The wage costs, including pension charges and social security charges, show an increase of EUR 14.4 million from 2016. A total of EUR 10.4 million of this increase is the result of the salary increase of 3% agreed for 2017, an increase in the pension charges and other social security charges, along with a slight increase in average workforce numbers. Other personnel expenses increased by EUR 4.0 million; this included a cost increase of EUR 2.2 million for temporary staff.

Other operating expenses fell by EUR 2.0 million from 2016. The accommodation and energy costs and the outsourced activities showed a decline of EUR 8.4 million. This was offset by an increase in expenses for technical business assets, general management expenses and other expenses in the amount of EUR 6.4 million. 'Other expenses' in 2017 included EUR 4.0 million in non-refundable VAT for which no additional funding was available (see: direct project expenses).

Direct project expenses fell by EUR 4.9 million: from EUR 70.5 million in 2016 to EUR 65.6 million in 2017. The direct project expenses included the non-refundable VAT (2017: EUR 17.2 million, versus EUR 16.8 million in 2016). This was financed from funds provided by the government for this purpose (see also: revenue from government funding).

Depreciation expenses increased in 2017 from 2016: by EUR 0.5 million (from EUR 16.7 million to EUR 17.2 million; these expenses fell by EUR 0.3 million between 2015 and 2016). The investment level for 2017 of more than EUR 54 million exceeds the depreciation expenses for 2017 by approximately EUR 37 million. The investment budget for 2018 also exceeds the depreciation expenses. This puts an end to the declining trend in depreciation.

Taxes

TNO has been in talks with the Dutch Tax and Customs Administration (Belastingdienst) regarding the method to be used to introduce corporation tax. TNO's main objective is to secure an overall exemption for corporation tax based on its public duty. This would put TNO on an equal footing with our European sister organisations with regard to the application of corporation tax. However, this is currently not the case. A second objective of TNO is integrality regarding the application of corporation tax.

Pending the discussion regarding the method used to introduce the corporation tax, both the 2016 and 2017 financial statements are based on the second objective, namely a duty to pay corporation tax for TNO as integrality.

The tax charge in the 2017 income statement is EUR 1.0 million overall. This represents a gain of EUR 0.8 million for the 2017 profit, whereby the tax loss for 2017 has been deducted from the tax gains generated in 2016. In addition, the deferred tax provision was adjusted in 2017, resulting in a EUR 0.5 million gain. Furthermore, a debt of EUR 0.3 million was created based on the filed tax return for 2016.

Equity

The special-purpose Defence Building reserve fell by EUR 24.0 million in 2017: from EUR 54.6 million at year-end 2016 to EUR 30.6 million at year-end 2017. This represents the balance of defence-related investments in real estate property (EUR 27.1 million) and allocations to the special reserve (EUR 3.1 million). The general reserve has increased accordingly.

The statutory reserve increased by EUR 2.0 million in 2017 to EUR 16.5 million at year-end 2017. The statutory reserve relates to non-distributable profits from investments in group companies.

The above changes, along with the earnings of EUR 58.3 million, result in an increase in the general reserve of EUR 80.3 million. A total of EUR 124.5 million of the equity relates to TNO's defence activities.

Cash and cash equivalents

The balance of cash and cash equivalents at year-end 2017 was EUR 95.3 million.¹ There was a decrease in 2017 of EUR 34.4 million versus year-end 2016. This decrease was anticipated for 2017 in light of the major investment programme.

In 2017, investments in property, plant and equipment exceeded depreciation by EUR 37.2 million. A total of EUR 27.1 million of this amount can be allocated to the new facilities built in 2017 for the Defence unit.

Within the working capital, the items 'Funds received', 'Taxes' and 'Premiums and the other debts' have been settled in the amount of EUR 19.7 million. The 'Claims', 'Work in progress' and 'Credits' items increased by EUR 6.2 million.

The outgoing cash flow relating to the provisions amounted to EUR 1.0 million in 2017.

Disposals of property, plant and equipment account for EUR 10.9 million of the change in cash and cash equivalents. As part of the reduction of vacant accommodation, one of the TNO sites was sold in 2017.

The loans included as part of the EZ-Toekomstfonds (EZ Future Fund), the payments received on loans and the result account for EUR 6.6 million of the increase in cash and cash equivalents.

Within the balance of cash and cash equivalents, a total of EUR 30.6 million was set aside at year-end 2017 for investments in defence-related property.

Workforce

The number of FTEs increased slightly (2,627 FTEs) from 2016 (2,618 FTEs) by 9 FTEs, thereby reversing the declining trend of recent years.

NOTES ON THE FINANCIAL INSTRUMENTS

In its regular business operations, TNO uses a variety of financial instruments which expose it to market and/or credit risks. These are financial instruments which are included in the balance sheet, along with future contracts in order to hedge future transactions and cash flows. TNO does not trade in these financial instruments and has procedures and codes of conduct in place to reduce the size of the credit risk for each counterparty or market. In the event of default on payment by any of TNO's counterparties, any resulting losses will remain limited to the market value of the relevant instruments. The contract value of notional principals of the financial instruments is merely an indication of the degree to which these financial instruments are used, rather than the amount of the credit and market risks.

Interest-rate risk

Interest-rate risk is limited to any changes in the market value of loans drawn down and issued. These loans are preferably subject to a fixed interest rate for the entire term of the loan. The loans are held until maturity.

Credit risk

TNO is exposed to credit risk related to transactions. This risk relates to the loss which could potentially arise if a counterparty defaults on payment. This risk is limited to the variety and diversity of any parties in debt to TNO. A concentration of credit

risk is only present in relation to the geographic spread of the outstanding debts in the Netherlands.

1. As this concerns the non-consolidated financial statements this is excluding the earnings from the sale of TNO Bedrijven.

IN-CONTROL STATEMENT

RESPONSIBILITY

The TNO Board of Management is responsible for the development, implementation and monitoring of the internal TNO management system. This system describes the governing, primary, supporting and improvement processes based on which TNO realises its objectives. In addition to managing risk, the purpose of this system is to secure the achievement of the operational, quality and financial objectives.

NATURE AND SCOPE

The management system is embedded in, and therefore forms an integral part of, TNO's management and governance model, as described elsewhere in this annual report (see page 14). The TNO core values and codes of conduct, to which all TNO employees are subject, also form part of this model.

The management system consists of a number of sub-systems the purpose of which is to reduce the main risks linked to the strategic objectives and opportunities to an acceptable level. This includes not only operational risk, but also strategic risk and risk related to compliance with laws and regulations.

The management system extends across both the TNO organisation and all (majority) participating interests.

As a guiding principle, TNO uses the line-of-defence model in establishing its management system, namely:

- First line: maintaining a solid foundation by management of the primary process on a controlled basis by all TNO employees within the (internal and external) parameters set in order to achieve the (strategic) objectives.
- Second line: support in and supervision of the appropriate performance of the work by management and staff officials.

- Third line: internal audits: on the TNO (primary and secondary) processes from the point of view of aspects such as quality, health and safety, compliance, internal controls (financial and administrative) and efficiency.
- Fourth line: external audits: conducted by third parties for financial aspects (by the external auditor) and non-financial aspects, e.g. quality audits for ISO certifications, and inspections of compliance with permits and licences (including health & safety and the environment)

STRUCTURE OF MANAGEMENT SYSTEM

The main elements of the TNO management system include:

- Duties, responsibilities and powers
- External assessment of strategic plan
- Planning & Control cycle
- Risk management
- Tax Control Framework
- IT and information security
- Internal audit
- Knowledge Position Audit
- External audits

DUTIES, RESPONSIBILITIES AND POWERS

All TNO employees work in accordance with the TNO management system, which has been approved by the Board of Management. This system describes the controlling, primary, supporting and improvement processes based on which TNO sets out to achieve its objectives. This specifically sets out issues related to (internal) powers, (external) mandates, information security, risk analysis and risk management in projects to be managed, composition and management of project files and IPIP policy and research development. The TNO management system is tested annually based on ISO 9001 and certified or recertified by external auditors.

EXTERNAL ASSESSMENT OF STRATEGIC PLAN

TNO drafts a [strategic plan](#) every four years. The *'Flywheel of innovation in the Netherlands'* plan describes TNO's mission and the strategic objectives for the years 2018 to 2021. The strategic plan is assessed during the drafting with the strategic advisory councils, with the objective of finding solutions to social issues which are as effective as possible. The strategy is translated into an annual plan. Business reviews are conducted in order to change the content based on current events and developments; these reviews are conducted on a quarterly basis by the Board of Management and the management boards of the organisational units as part of the planning and control cycle.

PLANNING & CONTROL CYCLE

A detailed annual plan, including a budget, is drafted annually, which is in line with the strategic plan. The realisation of the plan is assessed on a monthly basis against the budget, and is reported to the Board of Management. This also applies to TNO's participating interests. Progress is monitored based in part on Key Performance Indicators (KPIs). The period results are discussed on a monthly basis for each organisational unit by the Managing Director and the Controller of the relevant division on the one hand and the Chief Operating Officer and Chief Financial Officer on the other. A business review is conducted three times a year between the management team of each of the organisational units and the Board of Management based on milestones and KPIs, whereby actual progress is evaluated and adjustments are made where necessary.

RISK MANAGEMENT

The objectives of the risk management policy are to identify the main risks related to the achievement of TNO's objectives and to perform the activities in a controlled manner at all levels of the TNO organisation. To this end, a TNO-wide risk analysis

is created each year, which assesses the (internal and external) risks which could potentially jeopardise the achievement of the organisational objectives. The top six TNO-wide risks, including any additional control measures to be implemented, are ratified by the Board of Management and approved by the TNO Supervisory Board. Within the planning & control cycle, the TNO departments submit their own departmental risks and control measures. The progress of the control measures and the analysis of the residual risks are monitored through these business reviews and monthly reports.

TNO is a project organisation. The primary process of research development up to and including the exploitation of research results is conducted by means of projects which are each monitored individually. Dynamic risk management is conducted within the projects. This means that risks are identified during the stage of project development, along with any control measures considered necessary. During the management of the projects, these and any new risks are discussed by the Project Managers and Controllers concerned. Adjustments are made where necessary based on a new risk assessment.

IT AND INFORMATION SECURITY

Information security is given a very high priority, on account of both the innovative nature of TNO and due to government protection. TNO's business processes are highly automated; this applies both to the financial processes and to project management, purchasing, HR and other business processes. The organisation works mainly with SAP as an ERP application and MS Office as a project-sharing environment. Information is increasingly managed in the cloud. There are explicit internal rules in place for the processing and classification of information.

TNO has organised its security operations in line with the principles of ISO 27001. This security includes the data processing agreements the organisation signs with the providers of the IT solutions. These agreements are audited by an external auditor several times a year (ISAE 3402). In addition, the external auditor checks for informational security (general application controls, including automated division of duties and access to systems) as part of the audit of the financial statements.

TAX CONTROL FRAMEWORK

TNO uses the principles under the Tax Control Framework. This indicates how TNO manages its internal control of its tax obligations. TNO organises this framework such as to facilitate the administration and monitoring of the tax obligation in an adequate manner. In doing so, TNO manages the internal management system of operating processes which are relevant to the tax authorities and renders account for this in an examinable manner.

INTERNAL AUDITS

The Operational Excellence & Auditing conducts operational and financial audits. A third-year cycle was agreed with the Supervisory Board for the implementation of the Audit Plan (2016-2018). This plan is based on the (TNO-wide) risk analysis and the process descriptions contained in the TNO management system. The audit reports are discussed with the Board of Management and have been communicated to the Audit Committee of the Supervisory Board. The outcomes and recommendations serve as input for improvement processes.

KNOWLEDGE POSITION AUDITS

Knowledge Position Audits (KPAs) are conducted for each of TNO's areas of expertise by specifically formed committees of recognised experts in order to assess the quality and social relevance of TNO's knowledge base.

EXTERNAL AUDITS

As part of its audit of the financial statements, the external auditor checks the administrative organisation and internal controls. The management is informed of the findings through a management letter. Any findings result in improvement measures.

For specific quality regimes from laboratory facilities, permits and other areas, periodic audits and inspections are conducted by external auditors.

TNO incorporates any areas for improvement from the internal and external audits and tests these for progress and implementation during the next audit. As such, the learning ability of the organisation and ongoing improvement is encouraged.

CONCLUSION

Based on the management system described above and the outcomes of the audits conducted, the Board of Management has ruled that the management is adequately structured and has proved effective during 2017. No facts or indications have occurred that would contradict this conclusion.

It should be noted, however, that risks can also occur which cannot be anticipated and that not all inaccuracies, loss, fraud and violations/infringements of laws and regulations can be excluded.

INVESTMENTS

High-quality research facilities constitute an essential building block for the innovation research conducted by TNO. In addition to the investments required to keep facilities up to date, there is a growing interest in investments through which TNO can achieve or maintain a competitive position.

In 2015, 2016 and 2017, the Minister of Economic Affairs therefore decided to boost applied research in the Netherlands in the form of two tenders for securing an interest-free loan from the Future Fund for Research Facilities for investments with a development value of more than EUR 2 million and for a maximum of half of this amount.

The Future Fund was established in order to promote the creation of research facilities which could be of vital importance to the development of innovative products and services. This fund helps to establish the position of the Netherlands in the international innovation landscape, where research facilities in the surrounding countries are realised largely through government funding. Tenders were issued in both 2016 and 2017. As part of both tenders, TNO submitted a total of five proposals, all of which were granted.

RESULTS OF THE 2016 TENDER ACHIEVED IN 2017

The facilities from the first tender were granted in 2016 and achieved (largely) in 2017. This includes the following research facilities:

- *'Extreme UV Beam Line'*: used to investigate loadability through this type of radiation of materials and components from production machines for the semiconductor industry.
- *'Pilot line Additive Manufacturing'*, which is achieved in the partnership with the High Tech Systems Centre at Eindhoven University of Technology. This line is used to investigate how unique products can be made at great speed using a variety of materials (i.e. 3D printing) and equipped with smart integrated electronics.
- Facility for Optic Manufacturing in order to strengthen TNO's unique position in terms of freeform optics, as integrated into, among things, the spectrometers of the recently launched Tropomi satellite. TNO is currently working with partners on establishing a public-private partnership, the Dutch Optics Centre.

HONOURING THE TENDER FOR 2017

The following two proposals were honoured in the 2017 tender:

- Facility for the calibration of spatial instruments for the retention and reinforcement of TNO's contribution to the realisation of this type of highly advanced instruments;
- Instrument for research into laser satellite communication. The rapidly growing demand for bandwidth (i.e. the amount of data which can be exchanged for each time unit) calls for a transition to the use of laser-generated short-wave radiation. Development of these facilities will commence in 2018.

EMPLOYEES AND THE ENVIRONMENT – KEY FIGURES 2017

PERSONNEL

NUMBER OF EMPLOYEES

2,907 TOTAL WORKFORCE

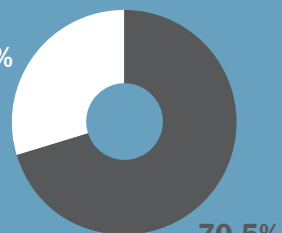
2016

 2,843

DIVERSITY

MALE-FEMALE RATIO TOTAL FOR TNO

29.5%



70.5%

Male
Female

ENVIRONMENT

TOTAL CARBON EMISSIONS IN KILOTONNES

Scope	2015	2016	2017
1	8	7	6
2	21	21	24
3	108	114	129
Total	137	142	159

ENVIRONMENT

RELATIVE CARBON FOOTPRINT

0.37 KG CARBON EMISSIONS/
€ REVENUE

2015 / 2016

 0.33 / 0.33

SICKNESS ABSENCE

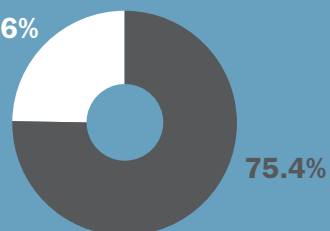
3.61%

2016

 3.84%

MALE-FEMALE RATIO – TNO SENIOR EXECUTIVES (SB, EB, top & middle)

24.6%



75.4%

Male
Female

TARGET **30%**

NUMBER OF KILOMETRES

Millions of km	2015	2016	2017
Business travel	14.4	13.3	12.8
Commutes	31.0	30.2	31.6
Air travel	25.2	26.9	25.8

SHARE OF TRANSPORT

	2015	2016	2017
Carbon emissions in kilotonnes	17.2	16.2	15.8
Difference compared to last year	- 2.3%	- 6.2%	- 2.3%
Difference compared to 2013	- 4.7%	- 10.9%	- 10.7%

EMPLOYEES ENGAGEMENT

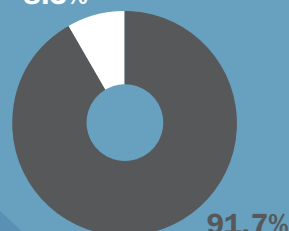
7.1 SCORE

2016

 7.0

NATIONALITY

8.3%



91.7%

Dutch
Non-Dutch

ENERGY CONSUMPTION IN TNO BUILDINGS

Carbon emissions	2015	2016	2017
Gas (10E6 m ³)	3.6	3.3	2.7
Electricity (GWh)	34.8	35.4	43.1
Heat (TJ)	18.2	17.2	20.4
Total	256	250	261

DIRECT CARBON EMISSIONS SCOPE 1

TJ fuel	2015	2016	2017
Gas	113	105	85
Diesel	10	10	9
Petrol	7	6	6
Total	130	121	100

RESPONSIBLE BUSINESS

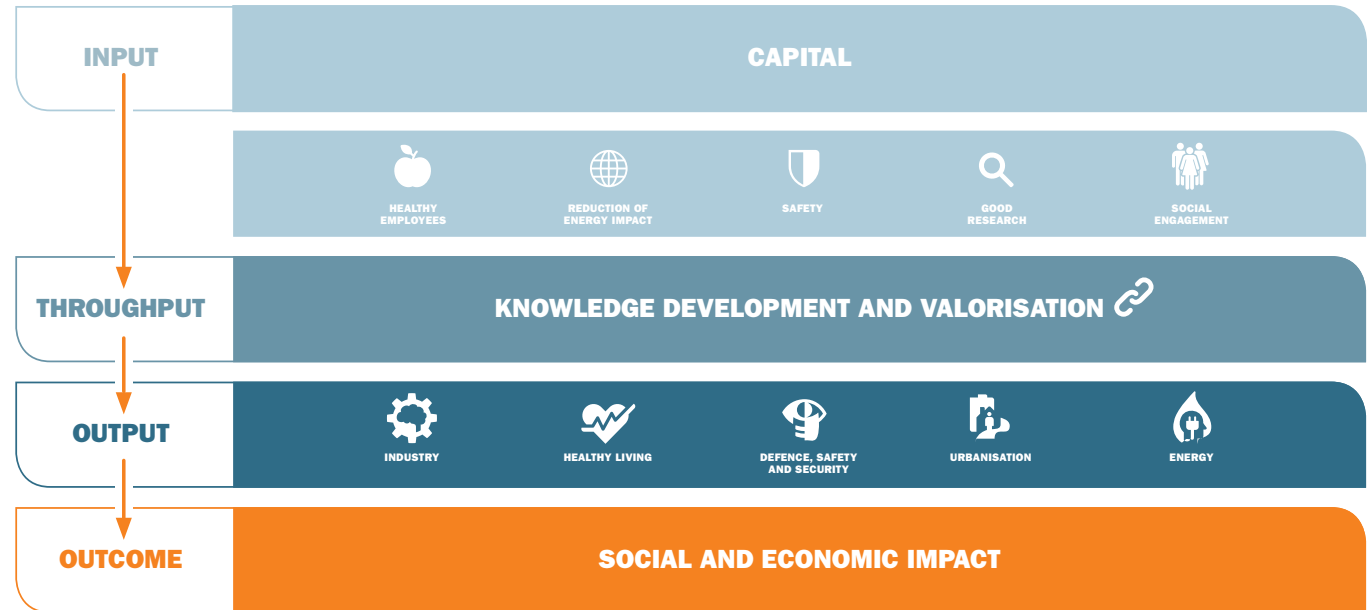
In conjunction with its stakeholders, TNO is organised along [five domains](#) with specific transition goals whereby the impact is economic, social and societal. Examples of this are available on the [landing page](#) and [TNO TIME](#). In this section, we discuss in detail the decisions TNO makes in its business operations for the purpose of creating (added) value. This is visualised in the value creation model.

TNO aims to be transparent in the way in which value is created, and TNO's goals in these endeavours. TNO participates in the Transparency Benchmark, a study into the content and quality of social reporting among the 500 largest Dutch companies, organised by the Ministry of Economic Affairs and Climate.

VALUE CREATION MODEL

The TNO organisation uses capital – including people, facilities and financial resources – to achieve its goals. A number of examples are shown at the bottom of this page. The value creation model shows how capital (i.e. input) is transformed into innovations (i.e. output) and impact (i.e. outcome) through [research development and valorisation](#).

VALUE CREATION MODEL



We identify the following two forms of capital in the input column:

Human capital: our employees contribute knowledge which has been acquired at universities or at the organisations of other employers. TNO employees grow and develop by working on challenging innovations, often together with partners. In addition, there are a number of internal education and trainee programmes in place. TNO employees use their knowledge and experience to disseminate their expertise outside of TNO. There are approximately fifty colleagues who work as professor and ten colleagues who work as lecturer at national and international universities and universities of applied sciences. TNO alumni are valued as employees by customers and partners.

Financial capital: TNO receives government funding from the Ministry of Economic Affairs. Of each euro contributed through government funding, 3.8 euros flows back into society, as evidenced by a study conducted by the European Organisation of Applied Research Organisations (EARTO), from 2016. TNO was one of the nine European research organisations on which the study is based.

STAKEHOLDERS

In order to achieve the desired social and economic impact, ongoing stakeholder engagement is essential. Each of the main domains has its own [Strategic Advisory Council](#), whose members are representatives of the most relevant TNO stakeholders.

In addition, the Top Sectors are consulted on the research and innovation agendas of the corporate sector, research and educational institutions and the government. Specific examples from 2017 include: innovations in logistics, TNO's role, the Energy Agenda, TNO's strategy and the new TNO organisation. The composition of the Strategic Advisory Councils will be changed in 2018 following the TNO organisation.

TNO also consulted dozens of national and local political representatives in 2017. The Dutch Parliament (divided into the Senate and the House of Representatives) is an essential stakeholder to TNO, as long-term political support is indispensable to the applied research organisations. TNO therefore regards it as essential to its public role to inform Members of Parliament on advances in technology and other areas, the feasibility and executability of proposals, and the implications of policy decisions and other decisions. TNO experts therefore provide information to the House of Representatives and the individual group specialists on specific issues. These experts are essentially always available to provide an explanation.

Potential new employees are another key stakeholder. TNO is focusing on scarce target groups in the form of specific events. TNO scores well in overall recruitment experience. Almost 90% of the respondents are satisfied, while 25% give TNO an 'excellent' score. As an area for improvement, candidates cited the lead time of the process. In response to this feedback, the organisation has accelerated the internal recruitment

process for new talent using a lean improvement process. The main stakeholders include:



For an overview including a selection of the stakeholder interviews, see [appendix Stakeholder meetings](#).

STRATEGY

Responsible business indicates a strong focus on the way in which TNO achieves its social impact through the five main domains. This is embedded in the organisation's activities as much as possible. In addition, TNO has a CSR (Corporate Social Responsibility) committee, which identifies a number

of key strategic priorities every year. The CSR policy was revised in 2017 so as to bring it in line with the goals set out in the new TNO strategy for the period from 2018 to 2021.

FOCUS OF CSR COMMITTEE

The following topics were prioritised by the CSR Committee in 2017:

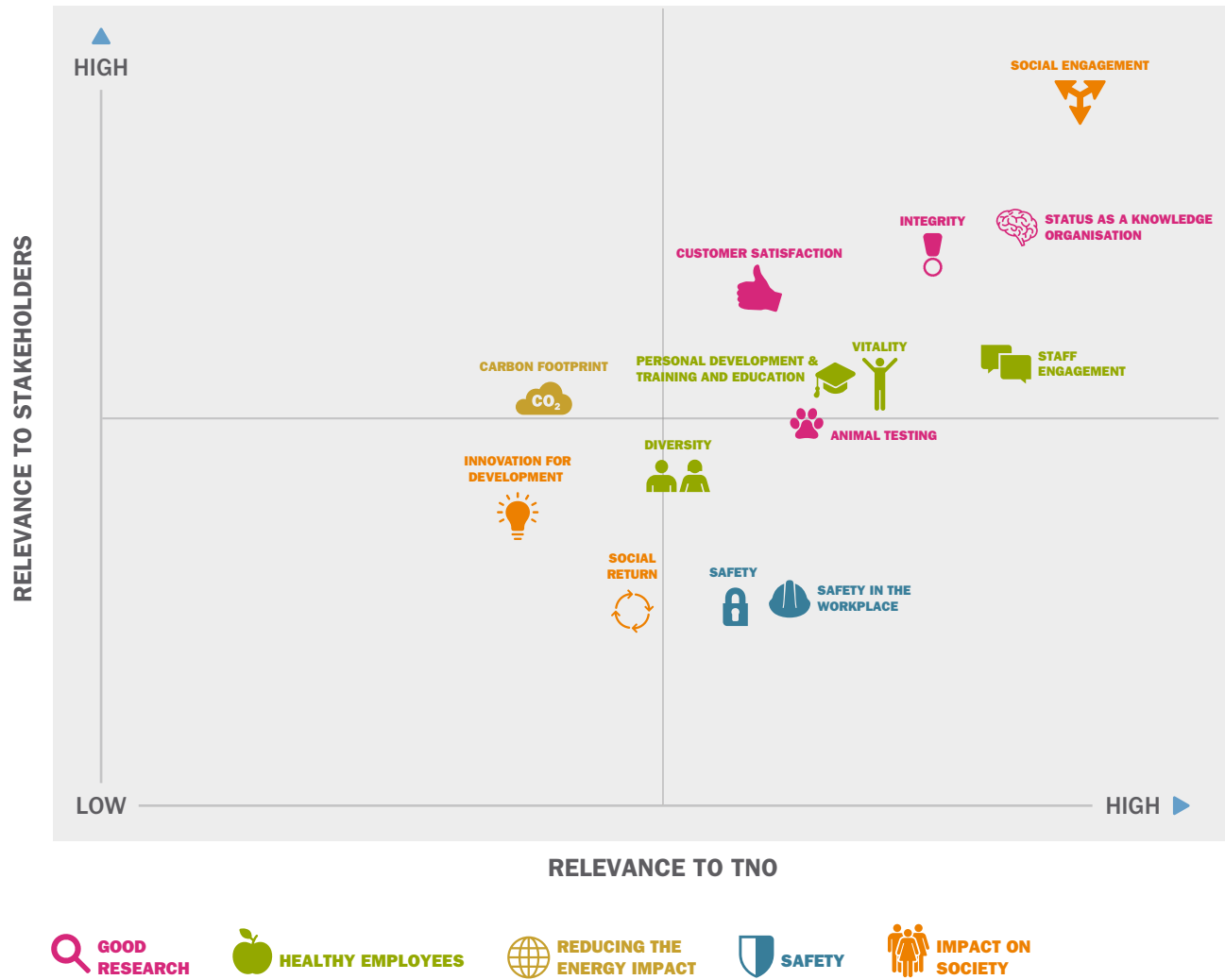
- **Creating Shared Value:** increasing awareness among project managers and others within TNO of the results achieved in economic, social and societal areas by TNO and its stakeholders.
- **Responsible Research and Innovation (JERRI):** the European Horizon2020 project named '[Joining Efforts for Responsible Research and Innovation](#)' (JERRI) received a follow-up in 2017. Internal and external stakeholders helped to set goals for the five dimensions: *Ethics, Gender, Open Access, Science Education and Societal Engagement*. For the dimension Societal Engagement, this is, for example, an additional focus on societal stakeholders and diversity in gender and age in Strategy Advisory Councils. This has resulted in the terms of reference for the new councils. Another result is the creation of a multidisciplinary Open Access working group to provide advice for an open-access/open-data policy. Other goals have a longer horizon and will be further implemented in 2018.
- **Sustainable Development Goals (SDGs):** TNO signed the SDG Charter NL in 2017, in which TNO expresses its commitment to contributing to these United Nations Sustainable Development Goals, a method for measuring impact accepted worldwide. The SDGs are one of the fundamentals of the new strategy and will be further operationalised in 2018.

[Further information about this subject.](#)

FIVE KEY ELEMENTS OF SUSTAINABILITY

In the new CSR policy for the period 2015-2018, the five key elements of sustainability were revised in the form of 'material' topics. This was preceded by talks with internal and external stakeholders. The materiality matrix for the policy will likely be revised in 2018. The social impact of TNO is displayed in the [showcases for each domain](#).

MATERIALITY MATRIX



FIVE KEY ELEMENTS OF SUSTAINABILITY

The five key elements of sustainability are:



GOOD RESEARCH



HEALTHY EMPLOYEES



REDUCING THE ENERGY IMPACT



SAFETY



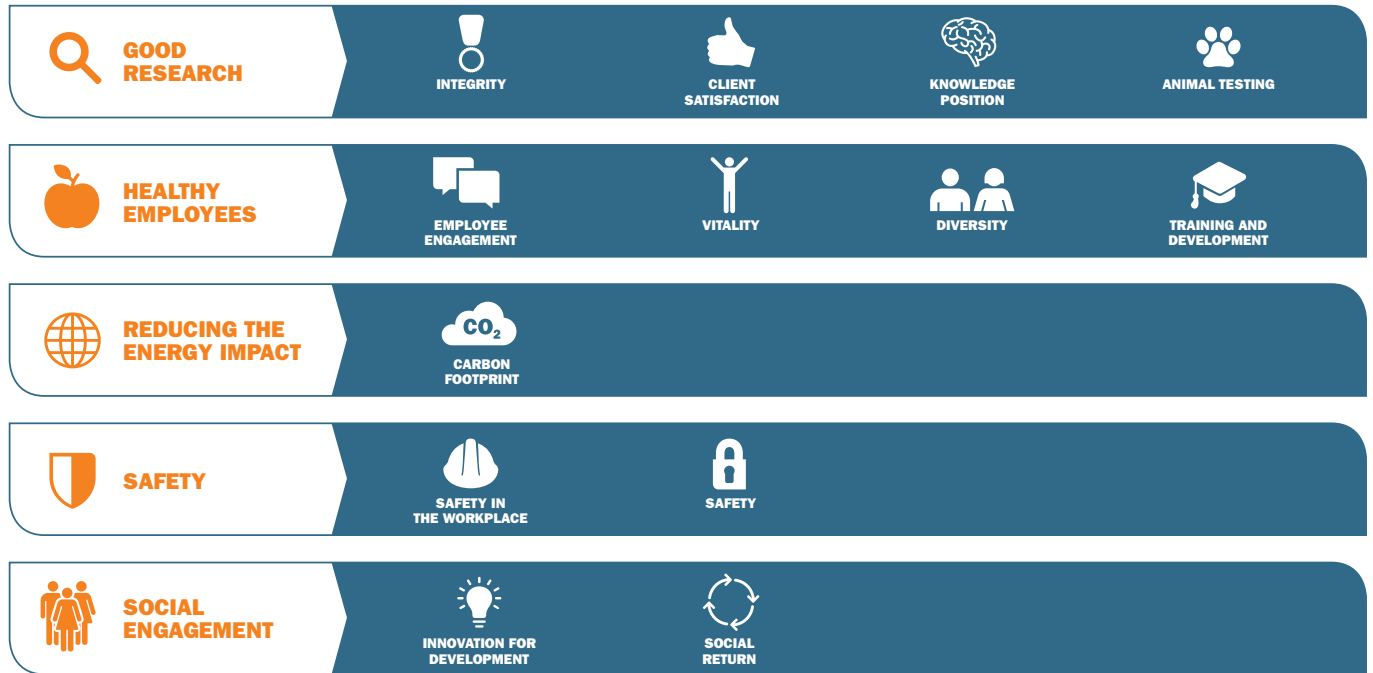
SOCIAL ENGAGEMENT

A number of material topics have been identified for each key element of sustainability, and the following pages described the goals, strategy and results achieved in each area. The key elements and material topics are shown in diagram form in the appendices.

G4 GUIDELINES

In compiling this report, we drew on the G4 Sustainability Reporting Guidelines of the Global Reporting Initiative (GRI). We report in accordance with the 'Core' option.

KEY SUSTAINABILITY ELEMENTS AND TOPICS



› APPENDICES

APPENDIX: DETAILS ON RESPONSIBLE BUSINESS

The five key elements of sustainability and associated twelve material topics are further detailed in the following sections.

GOOD RESEARCH

INTEGRITY

Objective

TNO is committed to integrity, and its stakeholders perceive the organisation's processes and procedures as ethical. TNO aims to meet the expectations of society regarding integrity and to keep learning from any ongoing trends and developments related to integrity and ethics.

Strategy

TNO has identified scientific integrity, business integrity, etiquette and society and ethics (including the treatment of test subject and test animals) as areas of focus that require continuous care. The ethical conduct of TNO employees is facilitated and assured in the following ways:

- Based in a vision in which our core values are central.
- Containing clear standards defined in the '[TNO Code](#)'.
- With an organisational structure which promotes integrity and good governance through a division of organisational units and divisions and an organisation as detailed in the section titled '[Corporate Governance](#)'.
- By focusing on creating employee awareness (and, if necessary, other stakeholders) of TNO's position, possible dilemmas involved, and the desired conduct.
- By agreeing on clear terms and regulations for people wishing to report potential ethics issues or misconduct of any kind (confidentially if necessary), or submit a complaint about TNO or one of its employees.
- By taking measures against situations which are not in accordance with TNO's values and standards.

The goals and strategy are expressed in the Annual Integrity Plan 2018 and the Multi-Year Plan 2016-2019 and are assured, among other things, by means of the contribution and procedures of the Integrity Committee and the [Integrity Officer](#).

The integrity score is measured annually and has been a KPI (Key Performance Indicator) since 2016. The purpose is ongoing improvement. As and when necessary, TNO anticipates effectively and reasonably to any signs from within and outside the organisation of non-ethical conduct (apparent or otherwise) if this were to be discussed. The Integrity Officer is consulted as and when necessary, so that undesirable situations can be solved through the management line as much as possible.

Results

TNO acts independently and with integrity, and will continue to do so in the future.

- TNO meets the basic standards for Integrity set by the Dutch government which are currently relevant to the organisation. For this reason, we will search for a new standard in the coming year which will allow us to set a new standard for meeting the goal of ongoing improvement.
- The annual Employee Satisfaction Survey shows that familiarity with the TNO Code increased from 5.0 in 2016 to 5.6 in 2017. Acting in accordance with the TNO Code increased from 5.4 to 6.0 (both on a 7-point scale).
- Acting with integrity in the immediate work environment is also perceived more favourably, increasing from 5.7 to 5.9 (same on a 7-point scale). This shows that employees are familiar with the TNO Code and act accordingly.

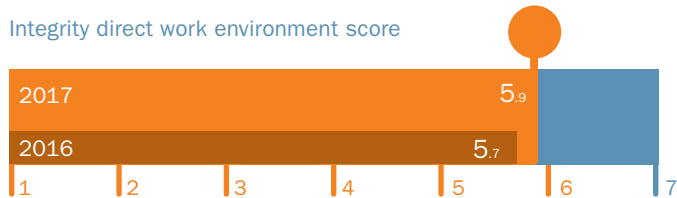


Complaints and reports

- One complaint was submitted in 2017 under the external complaints procedure; no complaints were submitted pursuant to the internal complaints procedure. In addition, no reports were made under the policy for reporting suspected misconduct.
- No formal complaints were made by employees in 2017 under the Whistleblowers Policy. The report made in 2016 as part of this regulation has resulted in a number of measures in order to avoid undesirable situations in the future.
- The Whistleblowers Policy was adopted in 2017 in the 'Policy for reporting suspected misconduct'. This has resulted in the establishment of a contact point, complete with an external chairman.

[Further information about this subject.](#)

Integrity direct work environment score



GOOD RESEARCH

CLIENT SATISFACTION

Objective

A high level of appreciation for customers for the added value and management of projects which support TNO's strong position in the world of applied research.

Strategy

Customer satisfaction is tested by an external company throughout the year. The information is shared both with the individual project manager concerned and to his or her manager, after which it is collected at the TNO level. There is also a formal [complaints procedure](#) in place, which has been published on www.TNO.nl and which describes the procedure for complaints.

Results

- The general customer satisfaction score for the projects we carried out in 2017 is 4.32 on a 5-point scale (versus 4.30 in 2016).
- TNO scored 4.63 (2016: 4.60) on knowledge and expertise on a 5-point scale (2016: 4.60).
- No complaints were submitted in 2017 under the external complaints procedure.

[Further information about this subject.](#)

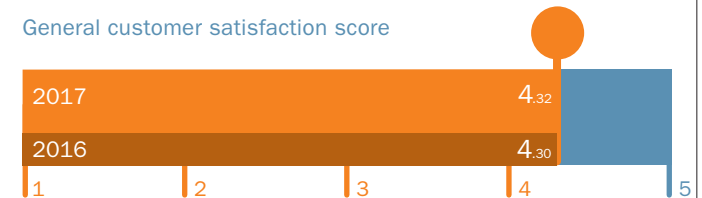
GOVERNMENT INFORMATION (PUBLIC ACCESS) ACT

TNO's goal is to continue responding to all requests in time, so that the interests of the applicants and the public interest are served as well as possible, with due respect for the interests of stakeholders, clients and the privacy of our employees.

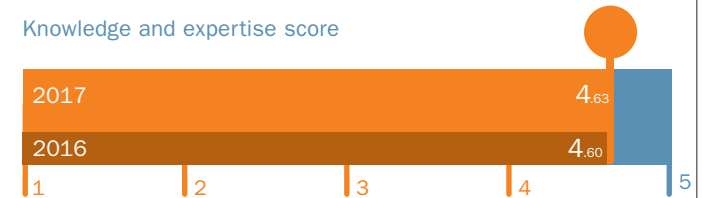
- A total of 31 new requests were received in 2017 under the Government Information (Public Access) Act. Of this number, 11 requests were addressed directly to TNO and 20 requests concerned the opinions of other management bodies.
- Three objections were made to a primary decision by TNO regarding a request under the Government Information (Public Access) Act addressed directly to TNO.

[Contact details](#)

General customer satisfaction score



Knowledge and expertise score



GOOD RESEARCH

KNOWLEDGE POSITION

Objective

An excellent knowledge position and sustainability of the research groups in order to achieve the desired economic, social and societal impact.

Strategy

The research groups together comprise the TNO technology portfolio. For each cluster of research groups, a Knowledge Position Audit (KPA) is conducted by an external audit committee. The recommendations of the Committee and the measures proposed in this basis are discussed with the Board of Management, after which they are formally recorded. These measures are included in the regular planning cycle and evaluated through a mid-term review by the research group.

Results

- A total of three KPAs were conducted in 2017 in the research groups of the Human and Operational Modelling (HOM), ICT and Life clusters.
- The HOM research groups scored 4 and 5 on quality (on a 5-point scale). A 4 represents an internationally operating research group and a 5 represents a world leader in a specific area.
- In the Life cluster, all research groups attained a score of 4. Due to the multidisciplinary approach, TNO is well equipped to use the opportunities related to Life Sciences.

- In the ICT cluster, the research groups scored 3 and 4. A score of 3 indicates a research group with a nationally leading position. Developments in the world of ICT are fast-moving, and TNO is well positioned to be part of these developments. However, the area of ICT and digital technology in which leading universities and large companies operate is highly competitive. The KPA Committee believes that it is therefore very difficult for TNO to be a world leader in this area.

[Further information about this subject.](#)

GOOD RESEARCH

ANIMAL TESTING

Objective

TNO aspires to conduct excellent biomedical research with the objective of improving public health. A number of different technologies are developed and applied for this purpose, including animal testing. TNO endeavours to conduct animal testing with the smallest number of animals and the least amount of discomfort for the animals concerned, while maintaining scientific integrity. Also, TNO is committed to dealing with animal testing with integrity throughout the entire chain.

Strategy

- In its research programmes, TNO aims to replace, reduce and refine (the three Rs) of animal testing, with a focus on development, acceptance and implementation.
- Dedicated, qualified and competent employees carry out ethical, carefully considered and high-quality research involving animals.
- TNO clearly and transparently communicates on animal testing and the policy it pursues.

Results

- The continuous evaluation of the Animal Welfare Organisation, established in 2015, resulted in 2017 in more effective and closer cooperation with employees involved who ensure the wellbeing of the individual test animals.
- Together with its partners, TNO conducts audits of critical suppliers in order to test the quality of animal testing across the entire supply chain.



- Studies conducted by TNO and using animal testing contribute significantly to science. For example, TNO published several articles in national and international professional journals in 2017, including an article on translational research into cardiovascular diseases in *The New England Journal of Medicine*.

Communication results

- In a national Dutch television broadcast, TNO explained the use and ethical treatment of animals for research purposes.
- A contribution related to animal testing was made to the permanent exhibition of Museum Boerhaave.
- TNO delegates attended a hearing in the Dutch House of Representatives on animal testing and test animals.

Specific information on the animal testing carried out under the supervision of TNO is available on our website, TNO.nl. The information is reported annually to the Ministry of Agriculture, Nature and Food Quality and subsequently published.



HEALTHY EMPLOYEES



EMPLOYEE ENGAGEMENT

Objective

Promoting strong employee engagement in their work, colleagues and the TNO organisation.

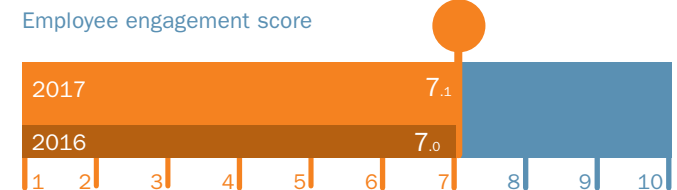
Strategy

- The Employee Satisfaction Survey is conducted annually and provides an accurate picture of how employees regard the organisation and which areas might be improved.
- The Survey represents a link in the cyclical process of measurement, drafting plans for improvement, changes, execution and re-measurement.
- The Employee Satisfaction Survey 2017 was conducted in a new format and sheds more light on the correlations that exist between performance, engagement, enjoyment in work and burnout symptoms on the one hand, and the work related factors that determine these on the other hand.
- The results were disclosed using a dashboard developed by TNO experts. This was followed by an analysis of correlations between the Employee Satisfaction Survey results and other (objective) work-related data.

Results

- The average employee satisfaction score was 7.1 (2016: 7.0).
- The scores on aspects such as 'Proud of TNO' and 'Employee benefits' improved slightly.
- The main concerns remain work-related pressure and burnout-related symptoms.

[Further information about this subject.](#)



HEALTHY EMPLOYEES



Objective

Vital, healthy and sustainably deployable employees.

Strategy

Absenteeism policy

TNO and Arbo Unie have been actively working on reducing workplace absenteeism, particularly the frequency with which people call in sick. In conjunction with social medical teams (SMTs), meetings are held for managers. However, since absenteeism is a concern for both managers and employees, TNO is also offering a series of measures from healthcare providers who support employees in preventing absenteeism and promoting fast and successful integration, as part of the additional services provided by Zilveren Kruis Achmea.

Vitality

In order to improve the sustainable employability of its employees, TNO intends to invest not only in the labour-market eligibility of employees, but also in their physical and mental fitness. Preparations for a Vitality campaign got underway in 2017. The purpose of this campaign is to incite employees to improve their own physical and mental fitness; a secondary purpose is to encourage managers to discuss health and vitality and – where necessary – help employees to improve their health.

Results

- TNO aims to increase familiarity with the Vitality campaign and increase awareness of, and the focus on, health and vitality among TNO employees.
- There is a sustained interest in the topic of the absenteeism policy, as sickness absence rates and the frequency with which people call in sick are relatively high.
- Absenteeism fell to 3.61% (2016: 3.8%).
- Frequency with which employees call in sick has fallen to 1.26 (2016: 1.4).

[Further information about this subject.](#)

Absenteeism



Absenteeism frequency of calling in sick



HEALTHY EMPLOYEES



Objective

A diverse workforce whose members can be themselves in a safe learning and working environment where the strength of diversity is utilised. Specifically, TNO is aiming for:

- 30% women in executives positions at TNO by the end of 2018.
- 25% new hires from outside the Netherlands by the end of 2020.
- Women to account for 40% of new hires by 2021.

Strategy

- Annual plan focusing on strategy, management agreements, instruments, interventions and communications.
- TNO has committed to the 'Talent to the Top' Charter and its target of ensuring that 30% of executive positions are held by women by the end of 2018.
- The new TNO strategy has set a target for the percentage of new female hires and new international hires. The purpose is to recruit women candidates for each new job opening during the primary process.
- All vacancies are posted in both Dutch and English.
- Recruitment committees are geared to the target applicants. If a woman is involved in the procedure, the selection committee will also include women. The same applies to international candidates.

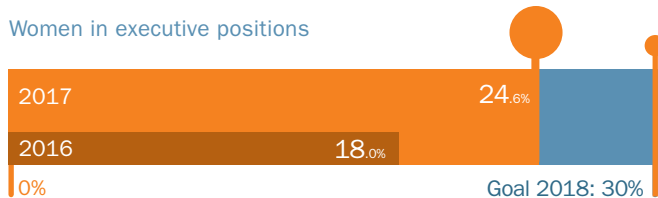


Results

- The policy has been updated and extended to include increased support and attention from the management. The awareness of the importance of diversity is increasingly shared and communicated at all levels of the organisation.
- The percentage of women in executive positions has increased substantially in 2017, reaching 24.6% (versus 18% in 2016).
- A number of successful measures have been continued and will be extended in 2018. This includes, for example, the Women in Leadership Program, the International Diversity Group, and the Women at TNO women's network (W@T).
- In 2018, TNO will strengthen its focus on the importance of diversity in recruitment and selection, and will participate in the Talent to the Top Cross-Mentoring Program. A bias training course will be provided to the upper management in order to further improve diversity awareness.

[Further information about this subject.](#)

Women in executive positions



HEALTHY EMPLOYEES



TRAINING AND DEVELOPMENT

Objective

Fostering a learning and working environment for all TNO employees in which they can manage their own development and can continue to enhance their talents. The purpose of these efforts is to ensure the long-term employability of all TNO employees both within TNO and beyond.

Strategy

- TNO wants employees to manage their own talent development. The organisation drafted a new vision and policy regarding Integrated Talent Management (ITM), in order to adapt all activities related to the recruitment, development, transfers and departures of talent to the latest trends and developments and to ensure that they are even more attuned to each other. This will be implemented in 2018.
- TNO employees find the support and tools they require for talent development in their social work environment (i.e. managers, co-workers, customers, etc.) and in the corporate development services provided by TNO (as of 2018, this is known as the 'TNO Talent Center).
- The TNO Talent Center was further developed in 2017 in order to develop transfers and departures as part of the 'Grow in, grow out' HR strategy. The TNO Talent Center promotes ongoing development by offering development activities which are in line with the TNO strategy. The TNO Talent Center, including a supportive Learning Management System, will be launched in 2018.
- Regulations regarding employee development and training are included in the annual Performance & Development cycle, which is supported by a single integrated system.

Results

- TNO managed more than 70 different training and development programmes in 2017 for the various areas of development and user groups.
- The onboarding programme for new employees was further developed.
- The Project Management development area, including the training and education design, is now in place.
- The Systems Engineering development area is now in place.
- In addition, several new programmes were developed and implemented, including the 'Orchestrating Innovation' development programme for directors of multi-stakeholder partnerships.

[Further information about this subject.](#)





REDUCING THE ENERGY IMPACT

CO₂ CARBON FOOTPRINT

Objective

TNO's target is to reduce the relative carbon footprint and to reduce vehicle-generated emissions by 20% in 2018 relative to the base year 2013.

Strategy

- The carbon footprint is calculated and published annually.
- Carbon emissions are reduced mainly through measures related to property and mobility.
- TNO is actively working on energy savings in the buildings, and in 2016 it launched an Energy Efficiency Strategy (EED guideline). In 2017, this resulted in an action plan for the relevant buildings. An extension has been requested for several buildings currently being renovated.
- Measures related to mobility include promoting the use of public transport, making professional vehicle use more sustainable, and encouraging options for teleconferencing. We received the Lean and Green Personal Mobility Award for this target in 2014.
- TNO purchases Energy Certificates to offset carbon emissions generated by the energy purchased.

Results

- TNO's total carbon footprint increased by 11% between 2016 and 2017. The increase is driven primarily by investments related to construction and renovation work at the The Hague Ypenburg and Waalsdorperweg sites (scope 3). These investments will result in a lower carbon footprint in the coming years.
- The relative carbon footprint has increased, due to higher revenue, among other factors.

- In 2017, the energy demand of the TNO buildings increased by 4% from 2016. To a large extent this is due to the increase in the power consumption for The Hague Anna van Buerenplein site, as a result of the occupancy of an extra floor.
- Vehicle-generated carbon emissions once again dropped by 2% from 2016. These gains can be credited mainly to business travel, fewer flights and use of cars and marginally more use of public transport for business travel. There was, however, a slight increase in carbon emissions from commuting traffic.
- The organisation's vehicle leasing policy provides for a restriction of the maximum carbon emissions of diesel and petrol cars. The total mileage using leased vehicles fell slightly.
- The measures to promote the use of bicycles have been relaxed, in anticipation of the implementation of the new TNO mobility policy.

The [key environmental data](#) provide a summary of the results of the carbon footprint.

[Further information about this subject.](#)

Carbon footprint



Energy consumption



Carbon emissions mobility



SAFETY



SAFETY IN THE WORKPLACE

Objective

Fostering a safe and healthy work environment for all TNO employees.

Strategy

- The Steering Committee for Health, Safety and the Environment, Permits and Contingency Management drafts an action plan once a year containing points for improvement to improve care for security, health, safety, and the environment.
- Training and educating managers, prevention officers and other key officials specialising in safety and health.
- Improving risk assessment and evaluation of new research projects (Risk Assessment and Evaluation project) which could potentially have an impact on health, safety and the environment.

Results

- A total of 63 employees were trained and hired in 2017 in accordance with the rules under the Health and Safety Act (*Arbowet*).
- Project managers and prevention employees use the new risk assessment and evaluation routinely at the start of new projects.
- A new employee permit system has been prepared in order to ensure that both TNO employees and contractors can work safely together. The new work permit system will be implemented in 2018.

[Further information about this subject.](#)



SAFETY

SAFETY (INCIDENTS)

Objective

Learning from incidents related to safety and the environment.

Strategy

- The implementation of a new incident reporting system where learning from incidents is central. The purpose is to develop an understanding of the root causes, take preventive measures, and learn from the incidents.
- TNO monitors the follow-up on the number of incidents reported by the set of Key Performance Indicators.

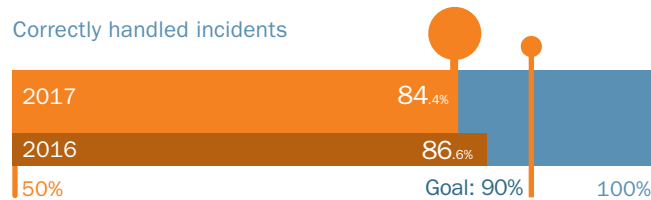
Results

- The rate of successfully handled incidents fell slightly in 2017, to 84.4% (2016: 86.6%). The target for 2016 was set at 80%, but was increased to 90% in 2017. TNO's goal is therefore to further improve this KPI in 2018.
- The KPI for Lost Time Injury was significantly lower in 2017: 0.9 (versus 1.9 in 2016). The LTI frequency is defined as the number of accidents involving absenteeism for every 1,000,000 hours worked. This concerns both accidents which must be reported to the SZW and accidents not required to be reported, but where the employee(s) concerned is/are absent from work. The decrease means that significantly fewer accidents were reported.

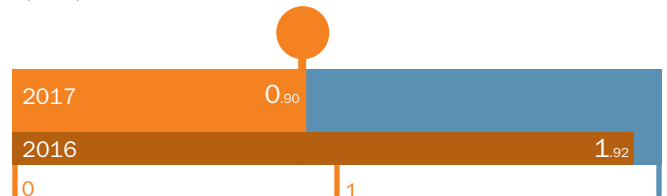
- The 'Working alone' app was launched in 2017. All TNO employees can use this app to request the assistance of co-workers and the company emergency centre in emergency situations, both during and after office hours. This is possible both at TNO sites and for field work.

[Further information about this subject.](#)

Correctly handled incidents



Number of accidents involving absenteeism for every 1,000,000 hours worked



SOCIAL ENGAGEMENT

INNOVATION FOR DEVELOPMENT (I4D)

Objective

- TNO helps to improve the living conditions of people in developing countries in a sustainable and innovative way and, in doing so, TNO contributes to the United Nations Sustainable Development Goals (SDGs).
- TNO inspires and encourages Dutch and international companies and aid organisations to undertake inclusive innovations together.
- TNO works in partnerships where value is created for all parties involved.

SUSTAINABLE DEVELOPMENT GOALS



Strategy

- TNO defines innovative projects with public and private partners and secures funding in order to be able to manage these projects.
- TNO creates a social and economic impact through project management.
- TNO scales up successful innovations to other countries.
- TNO actively communicates its goals, activities and results achieved.

Results

- In 2017, TNO worked on fourteen (multi-year) projects with a total amount involved of more than EUR 27 million and nearly EUR 4 million in revenues generated for TNO.
- TNO and its partners achieved an impact in the following Sustainable Development Goals (SDGs):
 - **2** TNO trained 335 farmers in Kenya and Uganda to grow crickets and provided them with access to microfinance – and with healthy nutrition through their new cricket business. Together, they doubled their revenues.
 - **3** TNO is helping to further improve maternal health services and youth health services in Suriname and Ghana by employing group consultations. Specific measures included: developing global yield curves, the use of a development score, and the application of a diagnosis kit for pregnant women.
 - **4** Together with War Child and partners, TNO adapted a successful arithmetic game designed for children in Sudan for refugees and children from local villages in Lebanon and Jordan. It also provided support for language education.
 - **5** and **6** In Bangladesh, TNO helped to improve menstrual health for women and girls. Girls were supported through special school campaigns and through the installation of toilets, an educational television series, teacher training and the introduction of affordable and fully biodegradable feminine hygiene pads.

- **7** In India, innovative refrigeration solutions were developed using solar energy. In Belize, the use of biogas was promoted.
- **9** In 11 countries across Africa and Asia, knowledge transfer was established and applied technology development, innovation and entrepreneurship were promoted.
- **17** The public-private partnership between North and South in innovation and development was promoted.

Further information about this programme is available on [TNO.nl/14D](https://www.tno.nl/14D).

[Further information about this subject.](#)



SOCIAL RETURN



Objective

Allowing disadvantaged job seekers to participate in the TNO workforce.

Strategy

Any job openings which arise are checked for suitability for disadvantaged job seekers. TNO is affiliated with the not-for-profit organisations Stichting Studeren, Werken op Maat and De Normaalste Zaak, all employment services for people with disabilities and other disadvantaged job seekers.

Results

A total of four disadvantaged job seekers were placed at TNO as part of our Social Return Policy.

[Further information about this subject.](#)



APPENDIX: GRI INDEX

In compiling this report, we drew on the G4 Sustainability Reporting Guidelines of the Global Reporting Initiative (GRI). We report in accordance with the 'Core' option.

GRI indicator	Description	Notes or location in report	Notes on partial or no reporting
Strategy and analysis			
G4-1	CEO's statement	Look back Paul de Krom Report of the Board of Management	
G4-3	Organisation's name	Profile, mission and impact	
G4-4	Brands, products and/or services	Innovation for life	
G4-5	Location of head office	TNO has its registered office in Delft, the Netherlands. The head office is located in The Hague.	
G4-6	Number of countries where the organisation operates	TNO is located in the Netherlands and invests in a number of companies the countries of which are listed in the general details of the companies. A full list is available on TNO.nl	
G4-7	Ownership structure and legal form	Profile, mission and impact Corporate Governance	
G4-8	Markets	Profile, mission and impact Organisation and environment Relevant developments in Europe Notes to the consolidated profit and loss account. The financial statements show how the activities are divided among the various stakeholders.	
G4-9	Company size	Key financial data Key data on employees and the environment	
G4-10	Breakdown of employees	Key data on employees and the environment Key data on employees and sickness absence	
G4-11	Employees covered by a Collective Agreement	Agreements on employees benefits are made with the Works Council once a year. See: TNO.nl	
G4-12	Description of the organisation's supply chain	Profile, mission and impact Value Creation Model	
G4-13	Significant organisational changes during the reporting period	Report of the Board of Management Strategy 2015-2018 and strategic plan 2018-2021	
G4-14	Notes on the application of the precautionary principle	In-Control Statement	
G4-15	Initiatives developed outside the organisation and endorsed by the organisation	Transparency benchmark Government Information Act Charter Talent to the Top Sustainable Mobility: Lean and Green Personal Mobility Various initiatives relating to Social Return	
G4-16	Membership in associations and interest groups	TO2 federation TNO is affiliated with a variety of organisations.	

GRI indicator	Description	Notes or location in report	Notes on partial or no reporting
Materiality and scope			
G4-17	Operational structure of the organisation	Organisational chart of TNO Corporate Governance	
G4-18	Process to determine the contents of the report	Sustainable business operations; Strategy Five key sustainability elements The structure of the report was established in conjunction with the Board of Management.	
G4-19	List of material aspects relating to the process of determining the contents of the report	Sustainable business operations; Strategy Materiality Matrix Five key sustainability elements	
G4-20	Scope	This Annual Report applies to TNO, where we make a distinction between the TNO organisation and its participations. Notes on our carbon footprint	
G4-21	Limitations of the scope or demarcation	Details on sustainable business operations This information is available, broken down by topic, at the link 'Further information about this subject' in the Annual Report.	
G4-22	Redefinitions	There were no redefinitions in 2017.	
G4-23	Redefinitions in reporting	In this reporting period the SDGs are integrated in the Annual Report. Innovation for development	
Stakeholder engagement			
G4-24	The following stakeholders are involved in the organisation	Profile, mission and impact Organisation and environment TNO federation Relevant developments in Europe Report of the Council for Defence Research Stakeholders	
G4-25	Basis for selecting stakeholders	Corporate Governance Sustainable business operations; Customer satisfaction Sustainable business operations; Employees engagement	
G4-26	Strategy for involving stakeholders	Strategy 2015-2018 and strategic plan 2018-2021 Corporate Governance Sustainable business operations; Customer satisfaction Sustainable business operations; Employees engagement	
G4-27	Organisation's response to issues arising in interaction with stakeholders	Report of the Board of Management Profile, mission and impact Strategy 2015-2018 and strategic plan 2018-2021 Sustainable business operations; Customer satisfaction Sustainable business operations; Employees engagement	

GRI indicator	Description	Notes or location in report	Notes on partial or no reporting
Reporting information			
G4-28	Reporting period	Notes to the consolidated financial statements	
G4-29	Date of previous report	Publication of Annual Report 2016	
G4-30	Reporting cycle	Notes to the consolidated financial statements	
G4-31	Contact details	Publication details	
G4-32	GRI reference table	GRI Content Index	
G4-33	External validation	Audit statement issued by external auditor	
Governance			
G4-34	Organisation's governance structure	Organisational chart of TNO Corporate Governance	
Ethics and integrity			
G4-56	Organisation's values, principles, standards and Code of Conduct	TNO Code TNO Statement of CSR policy Sustainable business operations; Integrity	
Material topics			
Topic Economic performance			
G4-DMA		Report of the Board of Management	
G4-EC1	Direct economic values generated and disseminated	Financial statements	
Topic Impact on society			
G4-DMA		Strategy 2015-2018 and strategic plan 2018-2021 Value Creation Sustainable business operations; Strategy	
G4-EC8	Indirect economic impact	Showcases TNO.TIME	
Topic High-quality research			
G4-DMA		Sustainable business operations; Strategy	
	Ethics	Sustainable business operations; Integrity	
G4-PR5	Results of Customer Commitment Survey	Sustainable business operations; Customer satisfaction See further information on this subject at the link contained in the Annual Report.	
G4-S011	Number of formal complaints	Sustainable business operations; Customer satisfaction	

GRI indicator	Description	Notes or location in report	Notes on partial or no reporting
Topic Healthy Employees			
G4-DMA	Social engagement	Sustainable business operations; Diversity See further information on this topic at the link contained in the Annual Report.	
G4-LA12	Diversity and equal pay	Sustainable business operations; Diversity See further information on this subject at the link contained in the Annual Report.	The report contains no information about age cohorts or ethnic and other minorities, as no distinction is made in our remuneration policy.
G4-LA10	Training and education	Sustainable business operations; Personal development & training and education Sustainable business operations; Safety and security See further information on this subject at the link contained in the Annual Report.	
Topic Reducing our energy impact			
G4-DMA	Environment	Key data on employees and the environment Sustainable business operations; Reducing our energy impact	
G4-EN3	Energy consumption within the organisation	Key data on employees and the environment Sustainable business operations; Reducing our energy impact	
G4-EN15	Direct greenhouse gas emissions (scope 1)	Key data on employees and the environment Sustainable business operations; Reducing our energy impact	
G4-EN16	Indirect greenhouse gas emissions (scope 2)	Key data on employees and the environment Sustainable business operations; Reducing our energy impact	
G4-EN17	Indirect greenhouse gas emissions (scope 3)	Key data on employees and the environment Sustainable business operations; Reducing our energy impact	
Topic Safety and Security			
G4-DMA		Safety can be divided into preventive measures and learning from incidents Sustainable business operations; Safety and security See further information on this topic at the link contained in the Annual Report.	
	Learning from incidents	Sustainable business operations; Safety and security See further information on this topic at the link contained in the Annual Report.	
Topic Social engagement			
DMA		Sustainable business operations; Social engagement See further information on this topic at the link contained in the Annual Report.	
G4-EC8	Indirect economic impact	We interpret this as an economic improvement of people estranged from the labour market. Sustainable business operations; Social Return See further information on this topic at the link contained in the Annual Report.	

APPENDIX: KEY DATA ON EMPLOYEES AND SICKNESS ABSENCE

	2014		2015		2016		2017	
	Number	%	Number	%	Number	%	Number	%
Workforce	3,009		2,926		2,843		2,907	
Permanent contracts	2,776	92.3	2,691	92.0	2,562	90.1	2,616	80.0
Fixed-term contracts	233	7.7	235	8.0	281	9.9	291	10.0
Part-time (< 100)	918	30.5	949	32.4	930	32.7	982	33.8
Part-time (< 90)	653	21.7	654	22.4	630	22.2	658	22.6
Sickness absence		2.9		3.4		3.8		3.6
Reporting frequency		1.3		1.3		1.4		1.4

› ACKNOWLEDGEMENTS AND CONTACT INFORMATION

› For further information about TNO, or if you have any questions or suggestions further to this report, please contact infodesk@tno.nl.

EDITING AND PRODUCTION
Marketing & Communications

TEXT
TNO in collaboration with C&F Report

DESIGN AND REALISATION
C&F Report, Amsterdam

PHOTOS
Eric de Vries

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TNO innovation
for life