
TNO innovation for life

# ANNUAL REPORT 2013


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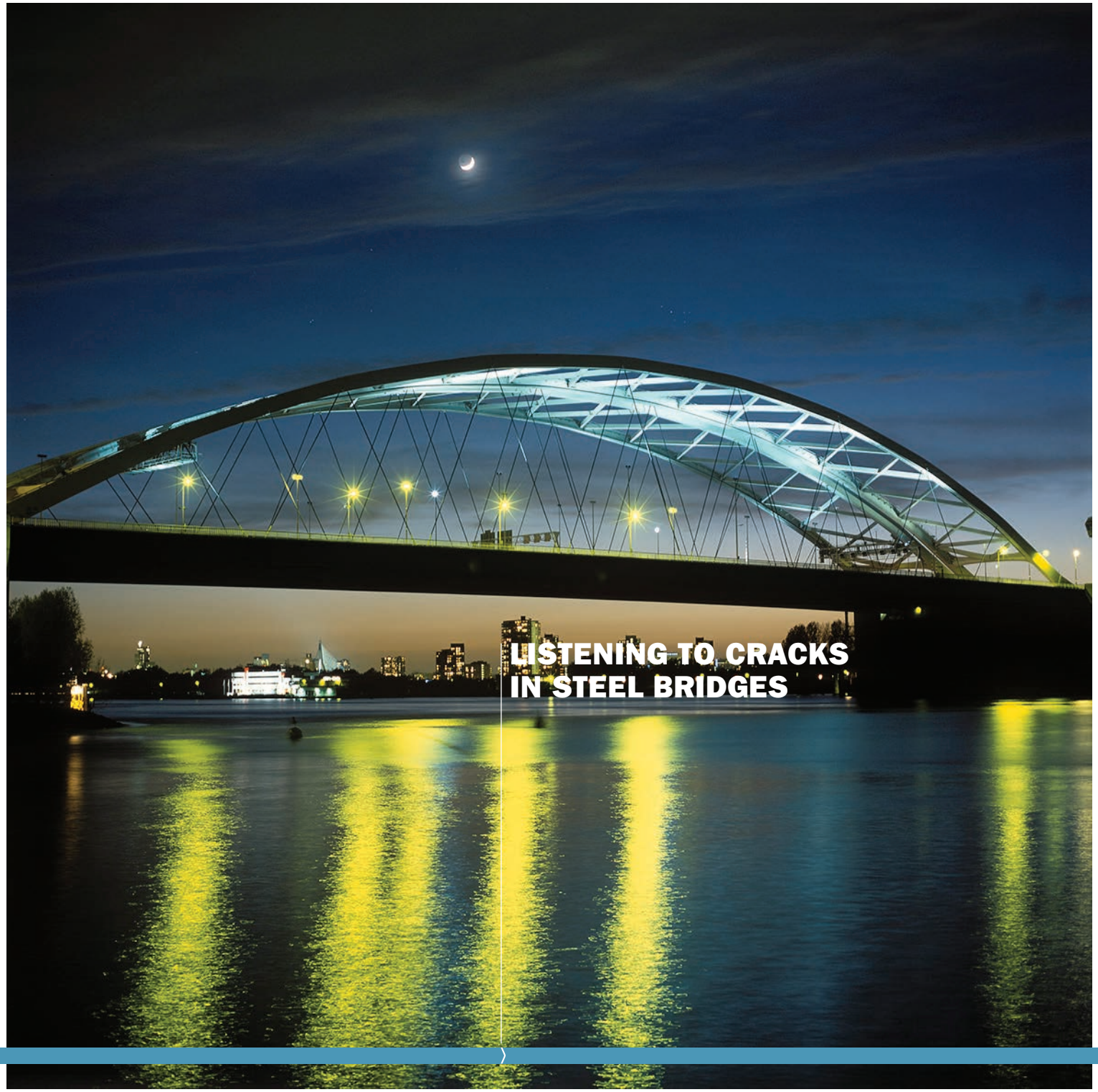

# LISTENING TO CRACKS IN STEEL BRIDGES

Inspecting the many hundreds of steel bridges in the Netherlands takes a lot of manpower, time and money, and often causes traffic problems. TNO reckons there is a smarter way to do this. Why not equip the bridge with sensors that register whether, and where, there are problems? So TNO's experts built a model of a bridge in the lab and equipped it with acoustic emission sensors at critical points to 'listen' to whether, and where, the steel exhibits cracks as a result of changes to the load on the bridge. This brings together knowledge of steel construction, sensor technology, calculation modelling and dataprocessing. Following successful lab trials, TNO is now working with the Dutch Public Works department to equip the Van Brienenoord bridge in Rotterdam with tens of sensors that produce a huge stream of data that can be read remotely in a datasystem developed by TNO. The data measurements serve as the basis for predicting whether, and when, inspection, maintenance or renovation is needed. This unique system is expected to generate huge savings.

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# REPORT OF THE TNO BOARD OF MANAGEMENT 2013

Two to three times a week TNO colleagues are asked for their expert opinion on a current topic on radio and TV. All in all, TNO appears in the media many times a day concerning innovative highlights and impactful analyses. However, this year also contained stories about the financially worrying situation of TNO and the effects this was having on people, the economy and society. A brief summary of events in the past year.

- The Embedded Systems Institute (ESI), the national platform for open innovation in the field of embedded systems engineering becomes part of TNO on 1 January 2013, thereby maintaining the intensive cooperation with the Dutch high-tech industry and firmly anchored fundamental research.
- We launch an app especially for SMEs that gives entrepreneurs answers to innovation questions.
- At the end of March TNO organises 'Technology seeks Entrepreneur' for the ninth time in a row, a gathering at which TNO invites innovative SME entrepreneurs to assess the market opportunities for TNO ideas within the context of the government's Small Business Innovation Research (SBIR) programme. This year, too, many of TNO's different innovative results are successfully commercialised by SME entrepreneurs.
- Other SME-geared activities are Week of the Entrepreneur and the entrepreneur conferences in regions where TNO presents itself.
- Girls Day is an international event where girls aged between 10 and 15 find out about science, engineering and ICT held this year in the Netherlands at the TNO premises in The Hague in the presence of H.R.H. Princess Máxima.
- Shared Research Programmes like Penrose, Van 't Hoff and Holst flourish. They show that this innovative form of joint research with companies and organisations is very effective.
- TNO is assisting Chinese climate research through cooperation with the Beijing Institute for Space Mechanics and Electricity (BISME).
- The partnership with Solliance, in which TNO is a partner, achieves a breakthrough in flexible thin-film solar cells, which boosts yield significantly.
- Together with The Hague Centre for Strategic Studies (HCSS) TNO publishes the book 'Resources for our Future, Key Issues and Best Practices', which deals with all aspects of the global resources issue. Minister Ploumen and chairman Wientjes of VNO-NCW receive the first copies.
- During the annual Innovation Relay TNO demonstrates connected driving. Minister Schultz van Haegen is a passenger during a drive on the A10 motorway in a car that drives itself.
- The European Space Agency launches the GAIA satellite, which has on board three unique instruments designed and built by TNO. They will make 3D pictures of a billion stars in unprecedented high resolution to give scientists insight into the birth of our Milky Way galaxy.
- The European Union publishes a 'Competition Proposal' to determine state support for research, development and innovation. This means, also for the TNO operation, the simplification and clarification of existing regulations.

– On 21 May 2013 Board of Management member Jan Willem Kelder opened TNO's Cyber Security Lab (CLS) in the presence of the National Coordinator for Terrorism and Security, Dick Schoof. In a special programme around 70 business relations from the 'golden triangle' debated what was needed to make cyberspace more secure. In one of the first new projects in the Cyber Security Lab, TNO will work with FOX-IT to develop the 'Cyber Incident Experience' whose aim is to enable the reconstruction of a customer incident within two to six weeks, analysing every aspect of that incident with all those involved.
– In Suriname around 4% of babies die at childbirth mainly due to premature birth, growth retardation in the womb and congenital defects. The Sint Vincentius Hospital in Paramaribo and TNO have developed a method to reduce this percentage. It focuses on all phases of the baby's development, beginning with the health of women that become pregnant. Two-thirds of all midwives working in hospitals and small health centres are being trained to inform and advise women about healthy pregnancy.

In 2013 a lot happened in the Dutch innovation landscape. In July Minister Kamp presented the 'Vision of Applied Research' to Parliament on behalf of the Cabinet, a document that underlines the importance of the TO2 institutes (the knowledge institutions for applied research) to the Dutch innovation system. The Cabinet proposed a number of amendments to boost the coherence of the approach and to refine the positioning in relation to commercial parties in order to prevent undesirable competition. The TO2 institutes responded by entering into discussion with the Ministry of Economic Affairs in order to define clear rules of play to apply from 1 January 2014. In 2014 we will also jointly present a strategic TO2 direction.

In the year under review we felt the effect of receding government funding and a decline in the growth of orders from industry and government. This inevitably led to a loss and a reduction in the number of research employees. This was due partly to the delayed start-up of projects from the top sectors but it became clear that companies and organisations were reluctant to invest in innovations in the prevailing economic climate. To counteract the impact of all of this, TNO took measures to reduce the costs and boost the effectiveness of the organisation. The 'TNO Transformation' and associated 'Lean' programmes will generate supplementary changes in 2014, based on the new strategic direction as detailed in the TNO Strategic Plan 2015-2018. Various stakeholders were actively involved in the creation of this new strategic direction. Discussions were held in roundtable sessions and the TNO direction was also extensively discussed in our Strategic Advisory Councils. Employees also contributed to the new strategy via crowdsourcing and participation in different working groups. But we also regularly engaged in dialogue with stakeholders on other matters, and had contact with representatives from political parties to explain the role and significance of TNO.

We are and remain very proud of our people who, despite a turbulent period, have continued to show passion in the work they perform. During the New Year's Reception in 2014 we presented the award for Excellent Researcher 2013 to Pascal Buskens on the basis of the assessment by a jury of Principal Scientists and votes from colleagues. He received this award for his work on Responsive Materials and Coatings. Pascal is a symbol for all our excellent researchers.

There were also changes in the Board of Management. Dr Tini Hooymans left after eleven years of service. Her departure was celebrated with the award of Officer in the Order of Oranje-Nassau for her services to TNO and the Dutch knowledge infrastructure. In addition, Jan Mengelers announced he would be accepting the position of chairman of the Executive Board of Eindhoven University of Technology as of 1 March 2014. His efforts on the knowledge and innovation fronts will therefore remain significant and relevant. Jan Willem Kelder has taken on the chairman role until a new chairman is appointed. Finally, three new members joined the board on 1 February 2014: Cis Marring, Wim Nagtegaal and Jos Keurentjes.

We believe that TNO has great value for Dutch society. Because TNO can lay multidisciplinary connections between fundamental knowledge and practice in industry, government and society. We are very confident that TNO can fulfil that role with success, both now and in the future. Knowledge, cooperation with other organisations and the availability of resources and funds are key ingredients to enable us to create the innovations that have an impact of economic and societal value. Innovation for Life!

On behalf of the TNO Board of Management
Jan Willem Kelder

*From left to right:*
*Wim Nagtegaal (appointed 1 February 2014),*
*Jan Mengelers (chairman until 1 March 2014),*
*Jos Keurentjes (appointed 1 February 2014),*
*Tini Hooymans (member until 1 October 2013),*
*Jan Willem Kelder (acting chairman as of 1 March 2014),*
*Cis Marring (appointed 1 February 2014).*

# TESTING NEW MEDICINES SAFELY

Sick children are often treated using medicines not specifically tested or registered for that purpose. And the child dose tends to be simply adjusted according to the difference in body weight with adults. But adults and children differ in many more ways than body weight, of course. Many of these key differences are known but that does not mean that we can predict the child dose. In short, testing medicines in children is indispensable to treating them safely and with optimum effect. TNO has a research facility that is unique in Europe where experts are working on a method to ascertain the right dose that should be administered to children by using extremely low and therefore very safe doses in studies in children. This microdose ensures that for most medicines the child dose can be objectively substantiated.

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# REPORT OF THE TNO SUPERVISORY BOARD

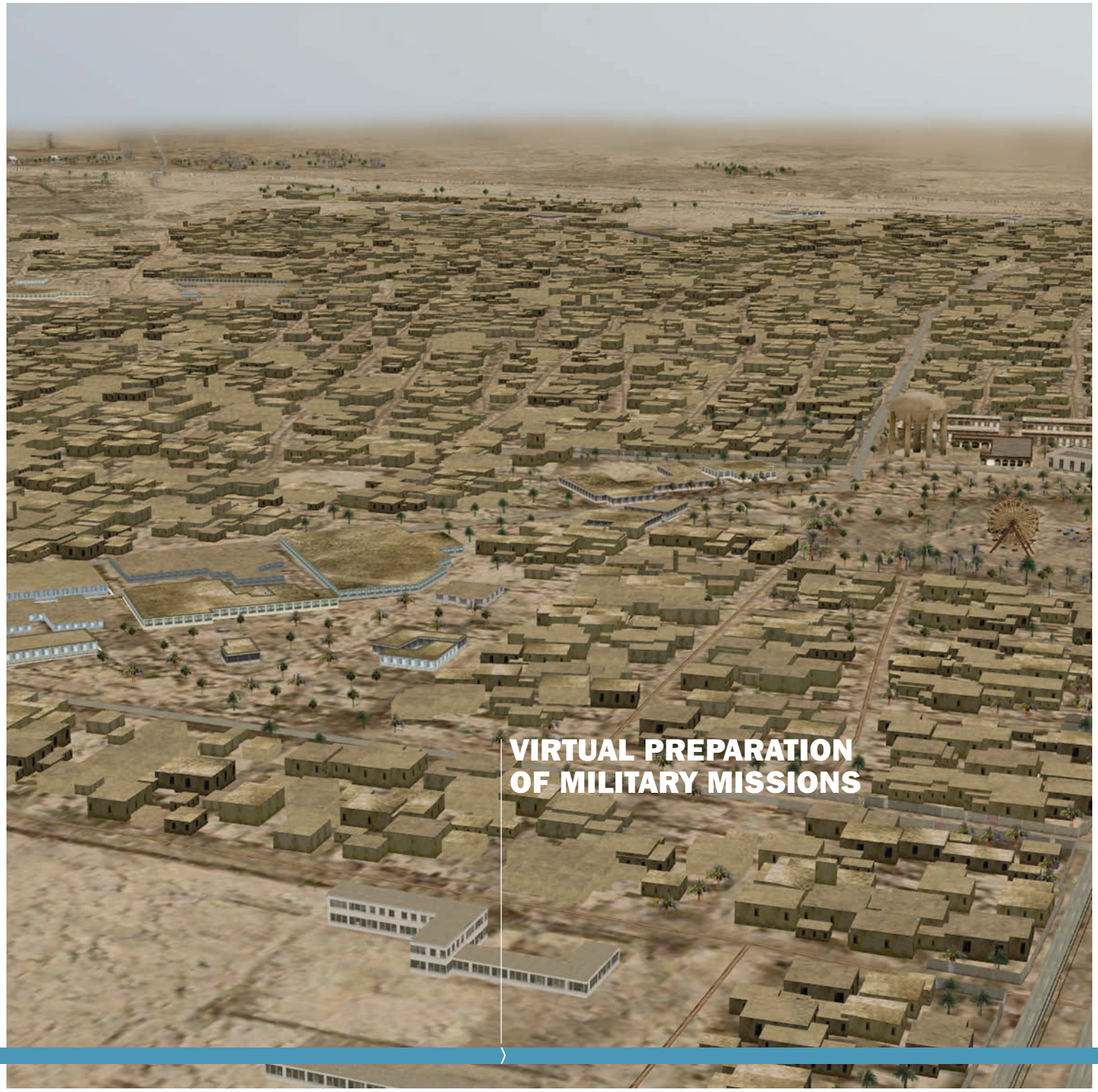
TNO has been an active part of the innovation landscape in the Netherlands for over 80 years. Established by law, with the aim of making research applicable for the general good, this very special organisation has a unique position in the societal network.

The power of TNO is in finding solutions to practical problems through the combination of different disciplines. The methods employed by TNO for this generate both insight and solutions. Although established by the government, TNO has consciously positioned itself as an independent organisation, which enables it to serve both government and industry objectively. The innovation policy of the government has been shaped by the top sectors structure, led by the Ministry of Economic Affairs, within which top consortia for knowledge and innovation, or TKIs, have been formed. TNO actively participates in the management of a number of these key TKIs.

Global economic trends in 2013 made it a difficult year for TNO. Moreover, the reduced government subsidy received in 2013 could not be fully compensated by market assignments. The Board of Management has taken measures to turn the financial tide and the Supervisory Board is monitoring the financial developments, assisting the Board of Management with advice where necessary.

Apart from the financial developments that warranted the appropriate attention, this year saw the foundations laid for the new Strategic Plan for presentation during the first quarter of 2014 to the Minister of Economic Affairs. The Board of Management has regularly sought interaction with the Supervisory Board about the strategic directions and choices. The Supervisory Board has underwritten the Strategic Plan 2015-2018, approving it in its December meeting. Throughout the year the Supervisory Board met at various TNO locations and during these company visits in 2013 was also struck by the impressive examples of innovation, from a new method of detecting agents of chemical warfare to the development of very robust asphalt. The Supervisory Board also regularly sought to be informed about subjects such as corporate social responsibility and the ‘Innovation for Development’ programme for development cooperation.

On behalf of the TNO Supervisory Board
Dr C.A. Linse, chairman



# VIRTUAL PREPARATION OF MILITARY MISSIONS

Military missions, like those in Afghanistan and Mali, pose many challenges to Defence forces, so good preparation is absolutely vital. The terrain is often inhospitable and little if any reliable information is known about it. TNO helps Defence to accurately chart mission areas. Up-to-date photos taken by satellites, drones or aircraft are made and other sensor data are converted into a virtual 3D world using sophisticated technology. And so a virtual mission area is created that soldiers can experience on their laptop, tablet or in a training simulator complete with all the roads, buildings and overgrowth. In their education and training they can drive their armoured vehicle through a village, walk through the streets and even check out the houses as if they are on the spot. With the slogan ‘we simulate tomorrow’s mission today with yesterday’s data’, the armed forces can prepare optimally for the tasks that face them. Together with Defence TNO is working on automating and improving the production chain that makes this possible and therefore enable the armed forces to prepare missions faster, cheaper and more effectively, which boosts the safety of the soldiers.

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# REPORT OF THE TNO COUNCIL FOR DEFENCE RESEARCH

The Council for Defence Research (RDO) determines the policy for TNO's Defence research part. The cornerstone of the relationship between TNO and the Ministry of Defence lies in the strategic partnership for a number of Defence-specific areas of expertise whereby domestic, or public safety, and foreign security, or Defence, are becoming increasingly intertwined. This is true for the Defence and security research of TNO and increasingly for the Ministries of Defence and Security and Justice. The latter Ministry, along with the new national police corps and security regions, is looking to TNO for a strategic partnership. The strategy of the Defence component of TNO for the next strategy period from 2015, established by the RDO, confirms this ambition.

September saw the appearance of the Ministry of Defence's new policy document, 'In the interests of the Netherlands'. It proposes that the reduced armed forces of the future must embody the right mix of high-tech capacities that can be deployed in all types of mission and be able to handle the unpredictability of conflict situations. Moreover, these same armed forces must be affordable. TNO is helping to make this happen through knowledge, technology and innovation. At the start of 2013, on 1 January, the 25 regional police corps and the national police corps merged into a single police corps: the national police corps. In its relationship with the Ministry of Security and Justice and with the national police corps, TNO wants to help shape and implement both their innovation agendas. Meanwhile, commercial players continue to feel the effects of the economic crisis and the top sectors often appear unmanageable in practice. However, there is a general sense of positivism, and an example of this is the new demand-driven programme for cooperation in the Defence related industry from 2014, in line with the Defence Industry Strategy updated at the end of 2013. Characteristic of *the golden triangle* of government, research and industry, the government is both orchestrator and user of the Defence and security area.
All in all, Defence revenue lagged behind that of the peak year of 2012. This was attributable to the delayed placing of several large projects at the beginning of the year, which could not be hauled back later. A positive financial result by Defence research for 2013, a healthy financial position and a record order intake give Defence research plenty of confidence for the future.
In the transition to a TNO matrix structure at the start of 2011 it was agreed with the RDO that the management of Defence research should be evaluated after two years. To this end the RDO set up a joint TNO Defence working group in 2013. The final evaluation report 'Evaluation of the management of TNO Defence research' was approved by the RDO in the latter part of 2013. The evaluation concluded that the quality of the knowledge support continued to be high but a few concerns were also voiced, with recommendations for improvement.
The aim is to have identifiable Defence research that is well connected to the rest of TNO. This must also secure Defence interests in the longer term. The RDO will implement the report's recommendations in consultation with the TNO Board of Management. TNO is making this part of its broader restructuring in advance of the new strategy period.

At the end of 2013 the RDO approved plans for the reconstruction of the TNO Defence research locations at The Hague Oude Waalsdorperweg, The Hague Ypenburg and Rijswijk at a total cost of 40 million euros. The reconstruction involves, among other things, certain laboratory activities moving from Rijswijk to Ypenburg and some office activities

moving to The Hague. In 2015 a decision will be taken on the continuation of CBRN activities after 2018, at either the current Rijswijk location or elsewhere. The decision was also taken to close the Heimolen terrain at Bergen op Zoom. The opening of the new TNO Cyberlab in May was a major milestone for this rapidly developing field. For the future there will be increasingly closer collaboration in this and other fields within the Hague Security Delta. In addition, the Defence Centre for Man and Aviation will be putting a sophisticated aeromedical training simulator at TNO in Soesterberg. The Hightox lab in Rijswijk will be incorporated within an equipment system from 2014 to which the Ministry of Defence will make a maintenance contribution. The continuation of biological protection research has been secured by bridging finance from the Ministry of Defence.

Theme and Defence research were prominent at various events. During Innovation in Defence 2013 TNO presented, along with the National Aerospace Laboratory of the Netherlands (NLR), the Maritime Research Institute of the Netherlands (MARIN), the Netherlands Defence Academy (NLDA) and the Ministry of Defence, the results and impact of the research programmes that had been concluded. At the Demoplaza the more than 400 participants were able to experience for themselves what the knowledge means in practical terms for the modern armed forces. And because innovation only really works in close collaboration within *the golden triangle*, the Dutch Defence and security industry had also been invited to learn about the results of the Defence programmes the day before, which was organised in cooperation with the NIDV industry association.

In November TNO co-organised with the Land Forces Command the Future Force Conference. The aim of the conference was for twenty top speakers from the Netherlands and other countries to carry out a strategic analysis of joint land-based operations. The Future Force Conference 2013 was a highly successful try-out for a Dutch strategic conference on modifying military capacities to a rapidly changing environment. Among the events in the security area were the Grand Conference on a ‘Resilient Digital Society’, with a substantial TNO contribution, and two workshops on Civilian-Military Cooperation whereby the participants from the Defence and security domains were unanimous in their opinion that Defence can be employed more structurally, individually tasked in part.

As always, actual projects and activities delivered the impact that is so central to TNO and its stakeholders, varying in 2013 from new collaboration with Norway for military use of space to radar-based activities with Thales and a contribution to the new cybersecurity agenda and the sale of knowhow on protective anti-RPG nets.

The space project concerns cooperation between the Dutch and Norwegian Ministries of Defence whereby TNO, NLR and the Norwegian FFI are developing affordable concepts for military capacities in space, which has become essential in view of increasing dependence on information, navigation and communication. Easier access to space and the lower costs of microsatellites create new opportunities for affordable services. Existing services like Galileo are also being used in the new concepts for space-related operations. Furthermore, discussions with Norway also feature far-reaching cooperation on protection against CBRN (chemical, biological, radiological or nuclear) agents.

On behalf of the TNO Defence Council
W. Nagtegaal, chairman

# MOBILE NETWORKS OPTIMISE THEMSELVES

Is it possible to get mobile networks that run on different technologies to cooperate? It would be extremely helpful if there were a mechanism that could autonomously optimise coverage, capacity and quality. That requires ‘thinking’, which means equipping the networks with intelligence. Then even very different kinds of network like 3G, 4G and wifi could cooperate optimally, something that has never been done before. But TNO is developing a technological vision with international partners to make this a reality. Experts work closely in the SEMAFOUR consortium with major players like Ericsson, Nokia Solutions & Networks, Orange/France Telecom and Telefónica. In this European project they are developing complex algorithms and management systems that will rapidly optimise the performances of the totality of heterogeneous networks. The operator will benefit from better network control, less maintenance, lower investment, more efficient use of energy and therefore savings. The customer will get better quality, reliability and speed, all at lower cost. If this ambitious target can be achieved in 2015, both operator and customer stand to gain considerably.

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# CORPORATE GOVERNANCE 2013

Corporate Governance means the sound and efficient management of an organisation that acts honestly, responsibly and transparently under proper supervision as stipulated in the governance framework. With a view to integrity and transparency, TNO has a code of conduct, a complaints procedure, regulations and a whistleblower scheme. In 2013 the code of conduct was completely rewritten and approved by the Board of Management.

## TNO BOARD OF MANAGEMENT

The Board of Management is charged with managing TNO and its responsibilities include defining and achieving the associated goals, policy, strategy and results. The TNO Act stipulates a collective management model for the Board of Management with collective and full accountability. Each board member is accountable for his or her own responsibility.

## COMPOSITION OF THE TNO BOARD OF MANAGEMENT

The Board of Management comprised three members.
On 1 October 2013 Ms Hooymans left after two terms and shortly before the end of the year the chairman, Mr Mengelers, announced he would be accepting the position of chairman of the Executive Board of Eindhoven University of Technology. In response, the Supervisory Board asked Mr Kelder to take on the role of acting chairman until a successor was found to Mr Mengelers. In addition, the Supervisory Board instigated a procedure for the successors to Ms Hooymans and Mr Kelder. The Supervisory Board also decided to add the position of Chief Financial Officer to the Board of Management. Following a positive recommendation from the Works Council, in December 2013 the Supervisory Board recommended three new members to the Board of Management in line with the TNO Act: Ms Marring, Mr Keurentjes and Mr Nagtegaal. The appointment by the Crown was published on 11 February in the State Gazette after the candidates were presented to the Minister of Economic Affairs and – for the member of the board who also chairs the Council for Defence Research – the Minister of Defence in the Council of Ministers.

## TNO SUPERVISORY BOARD

The Supervisory Board's duty is to supervise the policy of the Board of Management, covering the realisation of the goals, strategy, financial reporting and compliance with law and legislation. The TNO Act stipulates which decisions by the Board of Management require the approval or consent of the Supervisory Board. The Supervisory Board also provides advice to the Board of Management.

In the past the Supervisory Board appointed two committees from amongst its midst, namely the Selection and Remuneration Committee and the Audit Committee, both of which were charged with duties defined by the Supervisory Board. In the Selection and Remuneration Committee HR aspects are detailed for the Supervisory Board while the Audit Committee offers the Supervisory Board the possibility to supervise the financial activities and to strengthen TNO's risk management. For both committees regulations exist and these committees are referred to in the TNO Supervisory Board Regulation. The Supervisory Board held regular meetings five times in 2013, four of which were at TNO locations outside the head office. The Supervisory Board also held five closed meetings and attended two Works Council meetings. The Supervisory Board also met twice to discuss the Strategic Plan 2015-2018. Both the Selection and Remuneration Committee and the Audit Committee held two regular meetings while, where necessary, mutual contact took place outside of these meetings.

On 20 March the Supervisory Board approved the financial statements for 2012 and discharged the Board of Management from liability for its management and policy in 2012.

**COMPOSITION OF THE TNO SUPERVISORY BOARD**

The Supervisory Board comprises seven members. The first term of appointment for Ms Bensing ended on 1 September; she has since been reappointed.

**ORGANISATIONAL REGULATIONS**

Along with the Mandate Regulations, the regulations of TNO for the Board of Management, Supervisory Board and Strategic Advisory Councils form the Organisational Regulations of TNO. The Mandate Regulations precisely define authorities in order to safeguard the system of checks and balances as well as the condition that compliance with the mandate is checked each year by the auditor. TNO also has a risk inventory that is stipulated in a risk matrix. Furthermore, TNO is ISO 9001 certified.

TNO and authorised officers (up to and including the second echelon as specified in the Mandate Regulations) are, of course, registered at the Chamber of Commerce.

**ACCOUNTABILITY**

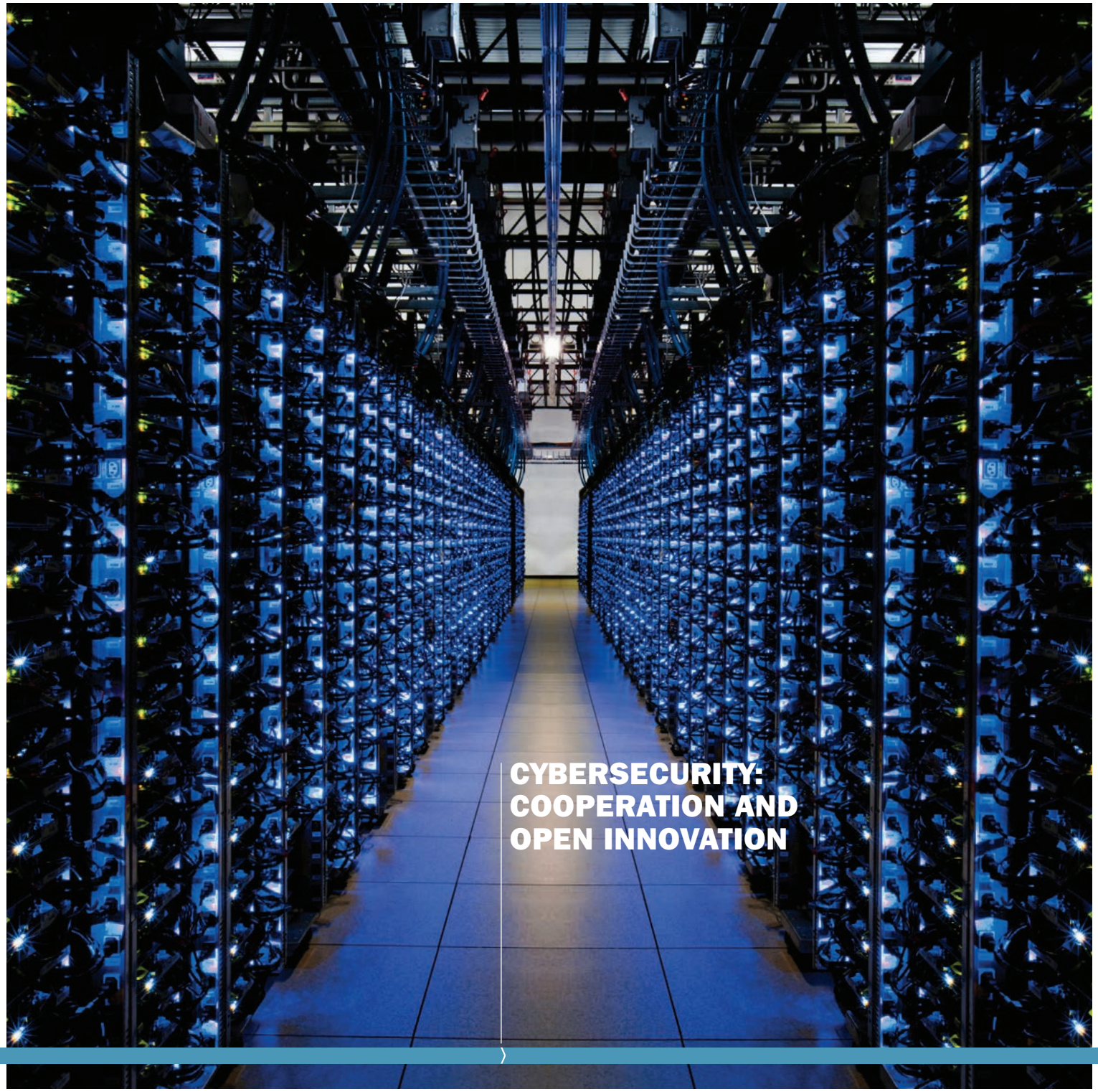
Pursuant to the TNO Act, the Board of Management accounts for government funding in advance by presenting a four-year Strategic Plan and the budget for the coming year to the Minister of Economic Affairs. Under the Act, the Board of Management then accounts to the Minister by submitting both the Annual Report and the financial statements for the previous calendar year.

The Supervisory Board has to approve these documents. On 11 December 2013 the Supervisory Board approved the Strategic Plan for the period 2015-2018 to be presented to the Minister of Economic Affairs in the spring of 2014. An auditor appointed by the Supervisory Board issues a report on the true and fair view presented by the financial statements.

The auditor, KPMG, is charged with auditing the financial statements for five years from 2011 with two one-year renewal options. The auditor also performs a separate audit on the legitimacy of receipts and expenditure using the audit protocol agreed between the Ministry of Economic Affairs and TNO.

**DELFT, 19 MARCH 2014**

On behalf of the TNO Supervisory Board
Dr C.A. Linse, chairman



# CYBERSECURITY: COOPERATION AND OPEN INNOVATION

No company or organisation, no matter how big, can stand up to cybercrime completely on its own. So it is crucial for government, industry and research, the so-called golden triangle, to join forces. This is why TNO, as an independent expert, is orchestrating cooperation with and between companies. A striking example of this is The Hague Security Delta (HSD) that formally began in the summer of 2013 as a Brainport for security, an initiative that derived in part from the ambition of the municipality of The Hague, international city of peace and justice, to become the cybersecurity capital of Europe. TNO, one of the founders of HSD, brings in knowledge, organises cooperation between parties in open innovation and has also accommodated its Cyber Security Lab here. Various SMEs have already successfully introduced commercial products based on the technology developed by TNO.

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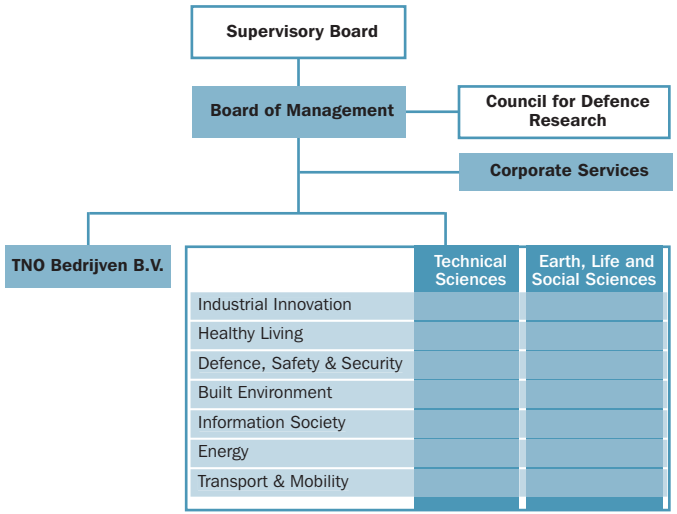
# ORGANISATION AND ENVIRONMENT

2013 was a year characterised by change, both outside and inside TNO. Changes in the innovation landscape around us and changes in the TNO organisation itself. In the middle of these changes we continued to realise impact for customers and society.




## MISSION AND STATUTORY TASKS

TNO connects people and knowledge to create innovations that sustainably boost the competiveness of industry and the wellbeing of society. That is our mission. And to this end we are connected to some three thousand companies and organisations at home and abroad. SMEs are a particular focus for us because this is where the biggest growth in employment and innovation can be anticipated. Our TNO4ID programme saw us active in developing countries.

TNO has a special innovation role for the Ministry of Defence and the Netherlands Geological Survey. Knowledge-intensive and innovative government tasks have been delegated to TNO in consultation with the Council for Defence Research and the Ministries of Defence and Social Affairs and Employment.

## DEVELOPING INNOVATION LANDSCAPE

Powerful changes in the innovation landscape characterised 2013, the first full year of the 'top sectors'. The Minister of Economic Affairs presented his 'Vision of Applied Research'. It was especially the slow start to projects within the top sectors and the limited award of TKI monies that had a negative effect on our orders. Action was taken to accelerate a phasing out of capacity. A positive trend was the more intensive alignment with companies and other knowledge players, including those in the top sectors, and a number of major public-private partnerships (PPPs) got under way, like the 'Snellius' and 'Van 't Hoff' programmes in which we actively use our knowledge and expertise to connect parties and accelerate innovations. The parliamentary debate of the 'Vision of Applied Research' prompted several critical questions about the role of the TO2 institutions in the Netherlands. A key issue centred on competition between the knowledge institutions and commercial knowledge institutions. During the year we invited representatives from these companies to discuss opportunities for cooperation. Following on from the parliamentary debate we also hosted invited politicians and explained to them the very special position of TNO in the innovation landscape: a pre-competitive role that complements the role of commercial knowledge institutions and supports industry, both large and small. We received a lot of appreciation for this initiative.

On the European front 2013 was the year that saw the launch of 'Horizon 2020', the revised European innovation policy. The significant compatibility between the 'Grand Challenges', the top sectors and societal themes lay a strong foundation for a relevant TNO role.

In the internationalisation strategy established in 2013 our activities outside Europe focus on strengthening our knowledge base and creating advantages for Dutch industry through participation in consortia. This internationalisation reinforces the global knowledge position of the Netherlands. A further aim is for TNO to help the Netherlands be a magnet for foreign companies to locate and thus make the Netherlands an innovative international living lab for the rest of the world.

## ORGANISATIONAL STRUCTURE

In 2013 the Behavioral and Societal Sciences expertise area was merged with Earth, Environmental and Life Sciences to become the new Earth, Life and Social Sciences area. The new organisation chart shows the seven societal themes, two expertise areas, Corporate Services, the Board of Management, the Supervisory Board, the Council for Defence Research and TNO Bedrijven B.V.

## STRATEGIC ADVISORY COUNCILS

Stakeholders play a key role within TNO. During the year we organise all kinds of meetings to share opinions and each of the seven themes has a Strategic Advisory Council that discusses strategic topics with leading people from government and industry. This year there was also a Round Table with some hundred entrepreneurs at director level to gain inspiration for the new TNO strategy for 2015-2018. The Midsummer Night of Innovation with around fifty top business relations also took place this year with a focus on inspiration for innovation.

## DEVELOPING A NEW STRATEGY 2015-2018

In 2013 cooperation was intensive with external stakeholders and a large number of TNO colleagues to arrive at the new strategic plan for 2015-2018. It involved hundreds of TNO colleagues, whether management, principal scientist, Young TNO-er or member of TNO Onderonsje, the network of foreign employees at TNO. There was also TNO-wide crowdsourcing that enabled TNO colleagues to contribute to identifying key trends and strategic shifts relevant to TNO.

Our external stakeholders were involved in the strategic plan via the Strategic Advisory Councils and in discussions at various levels in the organisation, whereby the roadmaps or larger corporate choices were central.

The new strategy is an extension of the current strategy that focuses on societal themes, with five transitions identified in energy, urbanisation, industry, safety & security and health. The strategy is also much more explicit in stating the roles TNO plays in the different phases of an innovation.

## IMPACT IN PUBLIC DEBATE

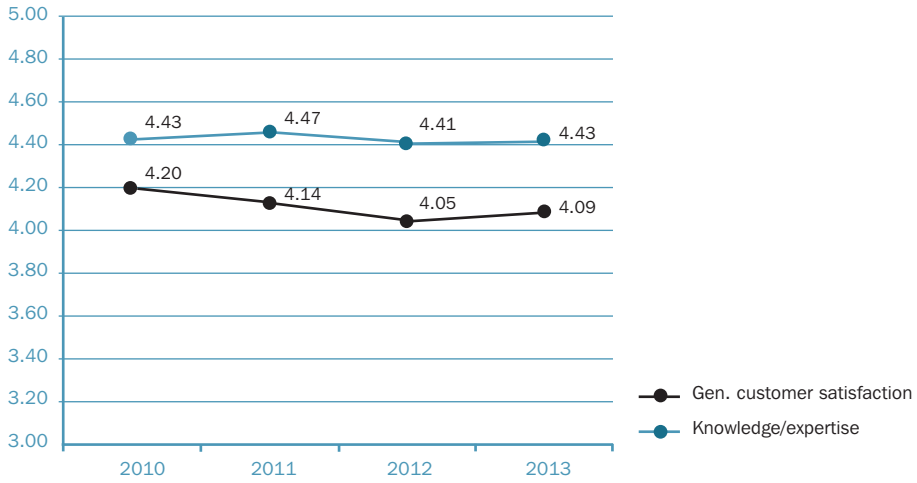
Together with The Hague Centre for Strategic Studies (HCSS) we played a role in the public debate on a number of significant societal issues. A brief list of the topics:

- Towards a future-proof energy system in the Netherlands: in this vision we make use of previous studies to describe how the energy system can be shaped on the basis that oil and gas will still be an important part of the mix in the coming decades. Energy transition means an enormous shift in sectors like agriculture, chemicals and logistics. The transition must be a responsible one that links ideals to realism and the technical possibilities to the economy. This report received a lot of attention in the media and formed a major source of input for discussions in the SER (Social and Economic Council of the Netherlands) about the Energy Agreement.
- Opportunities for the circular economy in the Netherlands: TNO reveals how we can deal with our waste in such a smarter, better and more sustainable way so that it once again becomes a resource. It concerns saving, reuse and recycling. The secretary of state for Infrastructure and the Environment presented the report to parliament and it featured principally in the debate on this topic last November.
- Resources for our Future: this report deals with the main developments in policy on resources, the geopolitical side of the issue whereby world powers shift according to the presence or absence of resources. The report, co-written by a number of entrepreneurs, also indicates the risks and opportunities that this scarcity means for various sectors in industry: food, building, energy, high-tech and more. The report was presented to Minister Ploumen of Foreign Trade and Development Cooperation.
- Innovating for Health: health is a central political and societal issue. It is a domain where innovation flourishes. TNO wrote a report on technological and social innovation in prevention and care.

## CUSTOMER SATISFACTION

The results of 2013 show a slight improvement in general customer satisfaction as measured in a random survey by an external agency. This score can vary from 1 (very dissatisfied) to 5 (very satisfied). Customer satisfaction for our knowledge and expertise remains high. The constant critique about our price-quality ratio does not reduce the likelihood of ‘possibility of repeat purchase’ and ‘possibility of a recommendation’.

Every quarter the board discusses customer satisfaction and takes measures if the scores suggest something must be done. The ‘TNO Infodesk’ is an important point of entry for questions from both external relations and for TNO colleagues looking for a specific expert for one of their customers or one of their projects. The Infodesk has an overview of all the knowledge available in house or in one of the holdings of TNO Companies and of




the facilities TNO can provide, such as climate chambers or analysis equipment. In 2013 around 10,000 questions were answered.

**KNOWLEDGE AUDIT**

In 2013 the knowledge positions of 24 expertise groups was assessed by external international committees (knowledge position audit, KPA). These were:

1. the ICT cluster, 7 groups, with the committee chaired by Professor Willem Jonker, CEO European Institute of Innovation & Technology;
2. the Human Performance & Operations Modelling cluster, 7 groups, with the committee chaired by Professor Paul Schnabel, former managing director of the Social and Cultural Planning Office;
3. the Life Sciences cluster, 7 groups, with the committee chaired by Professor Jan Raaijmakers, director of Science & Business Development at GlaxoSmithKline;
4. the environment cluster, 3 groups, with the committee chaired by Dr Leen Hordijk, former director of the Institute for Environment and Sustainability, JRC, Ispra.

The KPA score awarded can vary from 1 to 9, whereby 9 signifies a group that is internationally dominant and 1 a group that is unknown and whose products and services lag behind its competitors. The average score is 7.4. It was ascertained that all groups work at international level and are capable of taking the initiative to develop new directions in applied research (7). Nine of the groups were considered internationally leading (8-8.5). Three groups have significantly improved by 2 points: Functional Ingredients, Business Information Services (5->7) and Media & Network Services (6->8).

The expertise represented in the committees is not only a critical mirror for the organisation but gives very valuable recommendations and ideas for further development in the research groups.

**TNO BEDRIJVEN B.V.**

TNO Bedrijven B.V. aims to get pioneering scientific knowledge that is developed within TNO to market.

Getting value out of innovation can be a time-consuming and sometimes difficult process. It demands vision, determination, close-to-market operations and capital. Where the market has not yet done this (market imperfection) TNO Bedrijven B.V. forms one of the 'bridges' for TNO between innovation and valorisation through risk-bearing connections with industry, experienced entrepreneurs and external financiers. By offering other business models than TNO, like privatisation and venturing, holdings can get from innovation to impact faster.

TNO Bedrijven B.V. is a private limited company and in legal, financial and governance terms fully independent of its shareholder TNO. As part of this

| | |
|---|---|
| (9) Dominant | Group operates internationally and leads/defines the technology (knowledge). |
| (8) Strong/dominant | Group operates internationally and is one of the leaders. |
| (7) Strong | Group operates internationally and, is not leading but can decide direction autonomously. |
| (6) Promising/strong | Group operates nationally as leader and can compete internationally. |
| (5) Promising | Group is nationally one of the leaders and is able to compete technologically. |
| (4) Tenable/promising | |
| (3) Tenable | Nationaly operating group. Is a strategy follower. |
| (2) Weak/tenable | |
| (1) Weak | Unknown group with products, services and processes that lag behind rivals. |

separation, the transfer of activities and intellectual property always conforms with market conditions. The Supervisory Board of TNO Bedrijven B.V., which is entirely independent of TNO, has the special task, in addition to its statutory responsibilities, to maintain the separateness of TNO from TNO Bedrijven B.V. in order to prevent any conflict of interests or semblance thereof.

Under TNO Bedrijven B.V. each year some three to five new commercially promising innovative companies start up.

# SHALE GAS: EMOTIONS AND FACTS

Emotions often run high in the debate about shale gas. Is it safe to drill for this natural gas that is sealed in layers of clay that lie kilometres deep and are difficult to penetrate? The method used for this is called fracking whereby chemicals and large quantities of water are used. Noise pollution, water contamination, earthquakes and truck after truck constantly driving past are the inevitable consequences according to the opponents of drilling. TNO has carefully listed all the evidence for and against in a shale gas arguments map. Citizens, interest groups, companies, civil servants and politicians can debate the topic properly using these insights and come to considered opinions.

The arguments map is gaining popularity in Europe: following presentations in English, Frech, German and Polish, it was presented to the European Parliament at the beginning of 2013. TNO is working on new technologies to make the production of shale gas safer and prevent or substantially reduce the negative effects on the surrounding environment.

TNO is regarded in Europe as a forerunner in shale gas knowledge and is now leading a sizeable research consortium, comprising tens of knowledge institutes from some fifteen countries.

TNO innovation for life

# INNOVATE WITH IMPACT

## ROLE OF TNO IN INNOVATION

In innovation industry, government and research are partners in *the golden triangle*. TNO, as a knowledge institution, has different roles in the development of an idea to its market launch, thereby connecting the development and application of knowledge to our societal and economic goals.

We develop and realise innovative ideas with private and public parties that co-invest with TNO in a range of cooperative projects. TNO spends its government funding on these programmes and projects as well as on developing a knowledge base. The results are shared with these parties and made generically available as far as possible.

When the innovation is a step further down the development line, parties ask TNO's direct help to get this to market and pays for the assignment directly. Agreement is then made for both parties, the customer and TNO, to use these results. Once an innovation is more or less ready for market introduction but the idea and execution are still too early for independent commercial introduction and private investors or banks consider the idea still too much of a risk, TNO Bedrijven B.V. can play a role. This organisation was founded in 1987 to make an activity ripe for launch and so successfully cross the bridge of innovation. TNO also fulfils a number of statutory tasks, such as that of R&D partner of the Ministry of Defence, the Ministry of Social Affairs and Employment, and we are responsible as the Netherlands Geological Survey for the registration of the subsurface.

TNO is geared to seven societal themes, topics of major societal challenge to which TNO both wants and is able to contribute. Throughout this report there are examples of impactful projects we realised in 2013.

## HEALTHY LIVING

Good health tops the list of most people's happiness factors. Healthy living requires sensible participation in society, a healthy lifestyle and good care. The innovations increasingly tend to occur in interaction with the user and in consortia with industry and other organisations.

Within the Healthy Living theme we initiate technological and social innovations for structuring our lives in a healthy way and for a healthy, active society. In 2013 this was described in the 'Innovate for health' vision. This combined approach is monitored in *living labs*, in which multidisciplinary knowledge providers, producers of new technologies, users, patients, care providers and care financiers are brought together at an early stage to jointly decide on a development agenda. TNO's expertise led to choosing the P4 Health and Care Approach, which means that in each innovation programme we want to predict and influence the effects of today on future health (P=Predictive), with a natural increasing accent on preventing disease (P=Prevention). We continue to request more input from the respective people, patients or otherwise, to take more responsibility for their health (P=Participative). Finally, we believe that benefits can be gained from both a health and cost perspective if diagnosis and treatment can be customised as much as possible to the individual patient's circumstances (P=Personal). This P4 approach has been applied in the 'Better in, Better out' programme in which we worked with the Royal Netherlands Physiotherapy Society, UMC Utrecht, ZonMW and the Ministry of Health, Welfare and Sport. Older patients that have to undergo an operation are treated by a physiotherapist both before and after the operation, which boosts their condition and recovery following the operation. Shorter hospital stays and much reduced re-hospitalisation due to recurring symptoms can result in significant cost savings. A conservative estimate of the costs that Dutch curative care can save by this intervention is 100-160 million euros annually.

This example reveals that new prevention and care concepts require not only new medical approaches but also new roles for parties, new value chains and different models for calculating costs and revenues among the various actors in healthcare.

**INDUSTRIAL INNOVATION**

In industry high-tech and innovation are becoming increasingly essential. The Industrial Innovation theme works with industry to create and improve industrial value chains. The development of technological innovations leads to sustainability and economic growth.

In 2013 we performed a wide range of assignments with and for large and small companies, both existing and new customers. Among the prominent customers were Moog Bradford, Vertex-Dental, algae processor Algae Food and Fuel, solar cell machine producer Smit Ovens and the Dutch Kidney Foundation. Within TNO we worked with and for these companies to get our knowledge into successful applications.

Open innovation research programmes were also the focus of much work, with Holst Centre and Solliance prominent, well functioning examples. In 2013 a start was made on a 3D printing research programme, Penrose, and the Biorizon programme on bioaromatics.

TNO also brings expertise into applications via spin-offs. In 2013 the company SOLIQZ was founded, together with a Dutch manufacturer of chemical pilot plants, for the *ultra-purification* of fine chemicals on the basis of our *Hydraulic Wash Column* technology that enables companies to distill more cheaply and flexibly. A second spin-off is LDI Systems, founded with a company in printed circuit board manufacture, a builder of laser plotters and direct-image systems. The partnership focuses on *Laser Direct Imaging equipment* to produce circuit boards at low cost but with a high degree of precision and speed. Finally, the Maritime Materials Performance Centre in Den Helder became privatised and now provides the market with existing knowledge as a private company.

In the year under review the TNO SBIR scheme 'Technology seeks entrepreneur' enabled a series of successful SME innovations. Liike the Technology of Sense company that used TNO technology to introduce the Apmon, a device that can measure simply and in real time atmospheric contamination in clean rooms, clinical labs and operating theatres. Match & Catch is a Poseidon product based on TNO's image recognition technology, which makes pirate refuelling much more difficult.

**ENERGY**

All over the world the energy supply will change drastically in the coming decades, with demand rising and reserves of easy-to-produce oil and gas shrinking. Through innovations in the Energy theme, TNO is contributing to a sustainable, efficient and future-proof energy supply.

In 2013 our natural gas knowledge was used to generate innovative technologies and methods to help optimise the utilisation of small gas fields, the aim of which is to keep up the levels of national gas production over the next few decades, ot the *30-30 goal*: stable production of 30 billion $m^3$/year from small fields through to 2030. We are doing this together with all the active gas operators in the Netherlands. TNO is also working on innovations for a safe LNG infrastructure to enable Liquefied Natural Gas to be used as a fuel instead of polluting coals and oil. We also worked on the transition to a sustainable energy system whose themes are: the development of efficient methods for (large-scale) applications for the capture, beneficial use and subterranean storage of $CO_2$, the development of innovative geothermal technologies, finding intelligent solutions for smart local sustainable energy systems (electricity, gas, heat) and the application of solar energy.

As the Netherlands Geological Survey TNO actively manages and makes available data, information and knowledge of the Dutch subsurface and natural resources present there, developing and using unique state-of-the-art models, databases and ICT systems. As in-house advisor to the Dutch government (Ministry of Economic Affairs) TNO supplies crucial knowledge and information for a variety of geological oriented policy dossiers, such as shale gas, earthquakes in the north of the Netherlands and spatial planning of the subsurface.

**TRANSPORT & MOBILITY**

Well organised mobility is important for work and relaxation as well as for the Netherlands as a trading nation. The Transport & Mobility theme aims to 'accelerate progress' through a combination of technological innovation, influencing human behaviour and smarter organisation. In this way we help make mobility and logistics become more efficient, greener, quieter and safer.

Traditionally we have focused our efforts on developing innovative solutions and less on their large-scale implementation. The current strategy is geared to cooperating with market players and, via them, reaching large numbers of users so that effect × volume = societal impact. TNO has developed a technology that gives travellers up-to-the-minute journey times via a smartphone app. We monitor the journey patterns of individuals via this app and predict how busy it is and will be at a particular spot. This was used successfully during the coronation parties in Amsterdam and during the 'Sensor City' experiment in Assen.

Together with the Dutch automotive industry and new parties in the transport and mobility sector, we are working on innovative solutions to make vehicles and traffic safer, greener, more fuel-efficient and more reliable. Following previous successful experiments with cooperative driving, whereby cars communicated with each other and with the infrastructure through wireless technologies, we took a drive with Minister Schultz of Infrastructure and the Environment in a self-driving car during a demonstration of autonomous cars in the busy traffic on the roads around Amsterdam. For the SER Energy Agreement we contributed to a vision and roadmap to get the transition to new energy carriers in transport that bit closer. In our sustainability vision of transport dual-fuel technology plays a major part. It is a technology where we are able, currently, to mix 90% natural gas with diesel and realise at the same time a high combustion yield, low $CO_2$ and other emissions.

Within the logistics top sector TNO is active at the interface where knowledge of cooperation between various parties and use of the latest IT architectures meet. This should result in a reduction of regulatory pressure in import and export and the real-time exchange of data between rival companies to make transport flows more efficient.

**BUILT ENVIRONMENT**

Ageing, economic pressure and environmental and energy goals are just a few of the major societal challenges that face us. How can we cost-effectively create a dynamic and sustainable environment? How do we want to live and work in the future? And what will our physical environment look like? Within the Built Environment theme we contribute to innovations for a sustainable built environment. The challenge we face is to enable people to live comfortably in a densely populated country and allow a competitive industrial response to this.

In support of urban policymakers, we performed with the Erasmus University a regional economic analysis of the relationship between the city and the port of Rotterdam. We also undertook an economic exploration study of the Amsterdam metropolitan region.

Within the KIC Climate, part of the Institute of Technology, we work on modelling urban systems in the area of water, mobility, energy and waste. TNO develops the tools to optimise these streams both separately and together.

For use in new building projects TNO is developing a model for an innovative, integral climate control system whereby blinds, weather prediction and clean air supply are aligned to generate energy gains and more comfort.

In the summer in Heerhugowaard we realised an initial demonstration model of compact thermo-chemical storage in the iCOON home. This is a compact storage system in which residents store solar heat during the summer and use it to heat their homes in the winter.

In cooperation with *Rijkswaterstaat* (Public Works Department) we demonstrated the use of monitoring techniques for management and maintenance. A unique sensor network installed on the Van Brienenoord bridge enables potential crack formation in the steel road to be detected and monitored, thus enabling reliable predictions to be made and maintenance scheduled. This results in cost savings.

**DEFENCE, SAFETY & SECURITY**

Wellbeing begins with feeling and being safe and secure. Security is a key global theme and instability threatens security in many forms. In Defence, Safety & Security we work on a more secure society by creating innovations for people who work every day at Defence, the police, emergency services and industry.

Within Defence research TNO again executed many impactful projects in the year under review. The spectrum of Defence research runs from exploratory fundamental research, also with universities, to demand-driven Ministry of Defence programmes including a key government-to-government component. It also contains programmes and projects for international organisations like NAVO and the EU (as well as CORDAID since 2013) and, finally, innovative contract research for the Ministry of Defence plus domestic and foreign industry and government. For military operations we seek innovations to boost the effectiveness and flexibility of military operations at affordable costs. Characteristic of our work is our contribution to the JPOW2013 exercise, the largest in Europe for air and missile defence. This is an area in which TNO an acknowledged international player. Defensive and offensive cyber research, still a recent research field by comparison, grew exponentially in 2013.

Cooperation with Thales on radar and integrated sensor suites once again bore fruit and another example of fruitful cooperation was the licence agreement with a Danish company to produce the RPG nets we developed to protect against rocket propelled grenades.

In the field of Safety and Security we contributed to the government's cyber security strategy in 2013 while the opening of the Cyber Security Lab in The Hague drew a lot of attention from organisations that want to co-research with TNO in this area.

The position of TNO in the field of event safety and security (monitoring the Nijmegen Four-Day Walk and Queen's Day), social media & security, the security regions (working netcentric and two major pilots for flooding and crisis management), vital infrastructure (including electricity grids) and in the field of civil-military cooperation can no longer be ignored.

The Nobel Prize for the OPCW also reflected on TNO, and formed the backdrop for a private-public partnership in which we trained UN inspectors in Syria. Cooperation and generating new business was also central in the foundation of the Hague

Security Delta in 2013. Not just research but also major events contributed to the impact of our defence and security work in the year under review, such as the 'Innovation for Defence' event in The Hague that we organised for the second time (this time with the Ministry of Defence and NLR) and the international 'Future Forces Conference' in Amsterdam, co-organised with the Land Forces Command and with many leading international speakers.

**INFORMATION SOCIETY**

ICT boosts innovation in almost every sector, making products, services and processes smarter, more efficient, better and more sustainable. Within the Information Society theme we research developments in communication and information provision as well as stimulate the introduction of new services, applications and policy on the basis of the latest insights. Together with industry and our social stakeholders we have identified three challenges. In several case ICT is the central topic but in other situations we combine technology with knowledge from an application domain or socio-economic knowledge.

The first challenge is growth, the primary objective, such as new applications for economic, personal and societal growth and the creation of new companies or divisions. The second challenge concerns security and privacy, topics that are just as much relevant to a digital virtual world as in our physical world, such as guaranteeing the integrity of information and secure, reliable ICT systems. The third challenge is the availability of ICT. Our increasing dependence on ICT is making its availability a cornerstone of economic growth and social wellbeing. This concerns continuity and the influence of the preferred architecture, interoperability with other systems and adaptability to changes.

A number of examples of activities related to these challenges:

- Developments concerning big data offer industry countless opportunities. For instance, we work with insurance companies to identify these, develop propositions and prototype. We are also active in the area of the concept of Information Value Provider that collects (open) data sources and adds value for different buyers. We develop methods in diverse areas like dike and livestock monitoring or the secure sharing of question and answer for sensitive personal information to help companies tap into new markets.
- We work with telecom providers and financial institutions to improve malware detection, prevent and remove viruses so that operations can continue unaffected. In this we cooperate with reputable international partners.
- With the arrival of the Embedded Systems Institute at TNO research and innovation in the field of ICT in hardware systems have been given a huge boost. With partners like NXP, ASML, Philips, Océ and Thales we develop, side by side with universities, intelligence for components in systems like cars, chip-manufacturing equipment and surveillance.

## RECOVERY PLAN 2013

In 2013 TNO worked on a new perspective of the future. Preparations for the Strategy 2015-2018 took shape to put TNO in an even better position to fulfil its mission. At the same time, TNO was confronted with worrying financial developments that made it necessary to intervene in less profitable parts of the organisation.

In the year under review, under the denominator of the Recovery Plan 2013, the necessary restructuring was defined and carried through to improve the financial situation and get 2014 off to a good start. The restructuring was the direct consequence of the significant arrears in work and order intake among a number of expertise groups. Where this was structural, measures were inevitable and meant trimming the expertise areas where demand was substantially less. This also led to the transfer of a group to TNO Bedrijven B.V. The measures ranged across all three expertise areas in the various locations throughout the country.

Following the decisions taken in the fourth quarter, some hundred jobs became redundant, and a further hundred jobs were lost to natural turnover and unsilled vacancies.

Despite the contraction, we succeeded in limiting the cost-price development from 2013 to 2014 through significant cost reduction.

## PERSONNEL

In 2012 the last employee commitment survey was held. Analysis reveals that three areas are ripe for improvement: customer focus, cooperation and openness. These areas helped determine the improvement plans at departmental level. In 2013 there was a lot of focus on communication and facilitating interaction between the various parts of the organisation.

Initiatives were taken not only at departmental level but also TNO-wide. A good example of this is the Works Council initiative to make an inventory of best practices and report on these. Discussions were held with nine research managers of departments with high employee commitment survey scores on what underlies strong employee commitment. The subsequent lessons learned were shared with all TNO personnel and inspired many.

In the ‘workplaces’ where the managers meet, the foundation was laid to clarify the common goals and how the different roles could contribute to this. The cultural aspect, a key determinant of commitment, was stressed and incorporated in the subsequent actions.

Personnel employed at 31 December 2013:

| | 2013 | | 2012 | | 2011 | |
|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % |
| Workforce | 3276 | | 3409 | | 3403 | |
| Permanent | 2978 | 90.9 | 3051 | 89.5 | 3063 | 90.0 |
| Fixed-term | 298 | 9.1 | 358 | 11.8 | 340 | 11.1 |
| Part-time (<100) | 946 | 28.9 | 978 | 28.7 | 971 | 28.5 |
| Part-time (<90) | 673 | 20.5 | 704 | 20.7 | 727 | 21.4 |
| Absence due to illness* | | 3.9 | | 4.1 | 3.8 | |

* Progressive 12-monthly month average per 1 December 2013

A new employee commitment survey will be held in mid 2014. This will help us keep a finger on the pulse and gain insight into the improvement actions taken.

**Springboard for talent**

TNO actively encourages employees in their careers and to facilitate the next steps through its ambitious 'breeding pond and springboard for talent'. 'Breeding pond' means offering employees valuable development that they can galvanise inside or outside TNO. TNO also forms a springboard by offering valuable work experience as a step-up to a job outside TNO. TNO wants to facilitate promotion because of a belief that this helps create a healthy organisation, successful careers and an innovative Netherlands. That also applies to the exodus of talent.

**Education and development**

The development of TNO personnel occurs predominantly in practice through taking on challenges and innovative projects on a daily basis together with colleagues and customers. TNO also supports the development of its employees through the corporate provision of all kinds of development programmes (training or education with coaching, intervision, action learning) linked to the TNO development lines and for various categories of employees. In 2013 a large number of employees underwent programmes in the Applied Technology, Consultancy, Project Management and Management lines. The staff has also invested in the professionalisation of its people, as when the whole HR community took part in a development programme that continues on into 2014.

In 2013 the TNO Academy offered both open registration courses and twenty in-company development programmes totalling some eighty groups and around 1100 participants over 4800 sessions (2400 days). The TNO Academy invested almost 1.5 million euros in its programmes in 2013, the main investment coming for the introduction courses and the Talent Development Programme (65.3%) and the development line programmes (23.8%). For 2014 various innovations and additions are being lined up, such as the preparation of a development programme for TNO employees with a commercial background and a reivigorated introduction programme.

The Career Development Centre (CDC) of TNO enhances the mobility and career development of TNO employees so that exiting TNO personnel can act as TNO ambassadors. Halfway through 2013 the service was reviewed and renewed with the aim to offer affordable qualitative career support for individual career development. The consultants of the CDC coach employees for internal redeployment and give them tangible advice on employment prospects or external programmes. The four external agencies selected by the CDC offer outplacement programmes (to seek a job outside TNO), career programmes ('Who am I, what do I want, what can I do and how do I do it?') and coaching of employees that want to begin their own businesses. In 2013 CDC catered for 109 programmes: 67 internal redeployment programmes and 42 career programmes or employment consultations. In total 83 TNO employees followed an external outplacement or career programme at one of the agencies.

**Contract with new health & safety service, Arbo Unie**

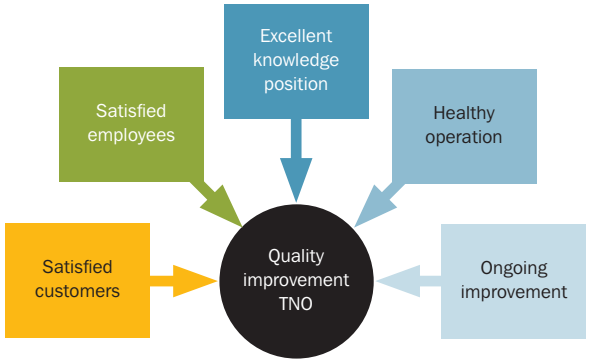
The contract with Arbo Unie states the targets and KPIs to realise the goals as stated in the section *Vitality*. These goals will be elaborated for each expertise area, theme or corporate service in plans being drawn up in cooperation with the Arbo Unie.

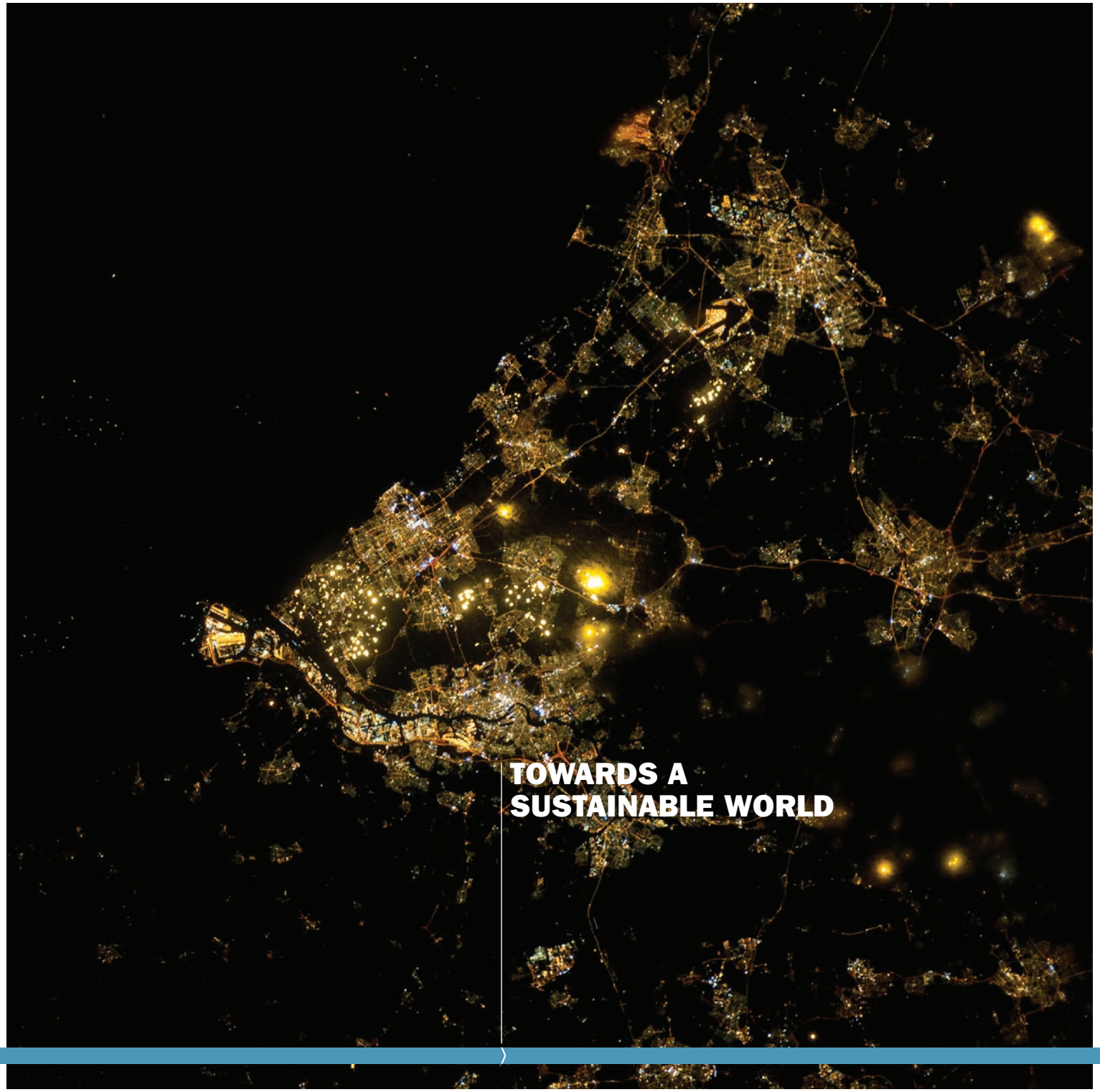
**Terms and conditions of employment**

In 2012 negotiations took place with the Works Council on terms and consitions of employment for 2013 but talks were suspended at the end of 2012 following agreement that TNO would initiate a working group to investigate the improved result, a hope that was caught up by the reality that the financial realisation and extent of the reservations for 2013 (as a result of the 'Recovery plan') were such that salary increases for that year could not be considered. Therefore, in consultation, the general measure was taken to keep salary increases at zero and the terms and conditions of employment unchanged. All employees with an employment contract with TNO come under the TNO terms and conditions of employment. Those with a temporary or part-time contract have, in principle, the same terms and conditions of employment as those on permanent contracts. In only a few cases do these terms and conditions deviate from this norm, and that is due to the contract being relatively short-term in relation to permanent employees.

## QUALITY MANAGEMENT

The quality policy of TNO is focused on satisfied customers, satisfied employees, an excellent knowledge position, a healthy operation and ongoing improvement of the organisation's performance. For many years TNO as a whole has been ISO 9001 certified and at various locations we have supplementary quality regimes (like AQAP, ISO 17025) to enable us to comply with specific customer requirements. The board of TNO constantly appraises the performance of the organisation and employs improvement projects throughout TNO to realise targets and to correct structural anomalies in the desired performance. In 2013 a lot of investment went into strengthening the professionalism and support of project management.





# TOWARDS A SUSTAINABLE WORLD

One of the biggest challenges of the 21st century is the transition from fossil to sustainable sources of energy like sun, wind and biomass within a few decades. If this gigantic operation is to succeed, substantial scientific research has to be done. During the transition it is essential to closely monitor the effects of current and future energy use, both fossil and renewable, on the environment. A major source of information for this comes via the many orbiting satellites whose onboard instruments, often designed by TNO, measure climate and air pollution. In this respect TNO is coordinating the EnerGEO research project of the European Commission to calculate future scenarios through to 2050 and to develop tools to link energy models to those for environmental effects. This will enable government or industry per country or region to establish the most suitable locations for building wind farms, solar panels or biomass power plants so that the biggest energy yield is gained with the least harm to the environment. Thanks to EnerGEO governments can implement a well-founded energy policy and a greener, more sustainable world comes ever closer.

TNO innovation for life

# RESPONSIBLE AND DYNAMIC

Our society faces major challenges like good, affordable healthcare, green, safe and reliable energy, limiting the use of fossil fuels and $CO_2$ emissions, a socially and physically safe and secure living and working environment. Trends such as ageing, urbanisation, regional contraction and new ways of working imply new, sustainable requirements. These are complex issues that challenge us all.

## A NEW VISION FOR CSR@TNO

Sustainability is interwoven with all our seven themes for whose intrinsic shape we regularly hold stakeholder dialogues with the Strategic Advisory Councils, as described in the report of the Board of Management. In shaping a new CSR policy we approached stakeholders at the end of 2012 and beginning of 2013. These stakeholders are the employees (in all layers), Ministries, industry (large and small companies and both prospective and existing customers and partners), universities and other societal stakeholders like NGOs.

A concept of a new vision and approach served as a starting point for the discussions. An external dialogue challenged us to make the impact on society more concrete through knowledge and innovation while internally we discussed the importance of sustainability in our own operations. The results of these discussions as processed by the CSR officer are shown in the figure on page 31 that was discussed with the CSR steering group. The horizontale axis shows the relevance of TNO and the vertical axis the relevance for stakeholders.

### Adjustment and reporting

TNO has a CSR officer who, in close consultation with the director of Marketing & Communications (M&C), the CSR portfolio holder, substantiates the internal CSR policy that is directed by the CSR steering group charged with developing a new vision. In addition to the director of M&C, the director of Human Resources is represented and an expertise director to couple employee policy. They also are on the board of directors, which sees CSR more firmly established in the higher levels of management. The three innovation directors of Transport & Mobility, Chemical Engineering and Employment are also involved. The steering group met five times in 2013. The director of M&C, as chair of the steering group and as portfolio holder, had regular contact with the Board of Management on CSR.

The ‘Corporate Social Responsibility’ policy statement describes how TNO approaches people, planet and profit in terms of ethics, working conditions, health, safety and the environment. As in previous annual reports we have used the GRI directive to describe the developments in 2013. We use the GRI G3.1 directive, application level B+ and have been inspired by GRI G4. In the coming year we want to step over to GRI G4.

## RESPONSIBLE AND DYNAMIC


**NOTES TO THE ILLUSTRATION**

**USE KNOWLEDGE AND INNOVATION TO HELP DEAL WITH KEY SOCIETAL ISSUES**: In each stakeholder dialogue the role of TNO in solving sustainability issues was the most important. To gain a picture of the societal issues on whcih TNO is working and the knowledge and innovation being developed to solve these issues, examples are provided throughout this annual report.

**DYNAMIC EMPLOYEES**: People develop knowledge. So dynamic employees who feel at home, can develop themselves and are committed to the organisation during its ups and downs are essential. We take a closer look at this in this section.

**INTERNATIONAL KNOWLEDGE POSITION**: TNO wants to operate internationally through the development of knowledge and have our knowledge position assessed externally (see Knowledge Audit in the *Organisation and environment* section).

**INTEGRITY**: According to what code does TNO work, how are dilemmas at work dealt with and where can employees turn for personal, confidential questions? These matters come under the auspices of the Integrity Committee and the Integrity Officer – this is elaborated in this section.

**CUSTOMER SATISFACTION**: We regularly consult stakeholders for the core business of TNO and have customer satisfaction assessed externally (see section *Organisation and environment*).

**INNOVATION FOR DEVELOPMENT**: In developing countries TNO uses sustainable innovations to help develop strategies and concrete solutions for sustainable growth and sustenance. This section takes a closer look at this.

**DIVERSITY**: Research has shown that diversiy enhances creativity and innovation. TNO aims to improve the distribution of men and women in all layers of the organisation. Read more about this in this section.

**REDUCE THE ENVIRONMENTAL IMPACT OF OWN ORGANISATION**: Focus on the environmental impact of what the organisation does, with attention devoted to sustainable purchasing and reducing the $CO_2$ footprint of own mobility and energy consumption at our locations. More in this section.

**SOCIAL RETURN**: In this context TNO focuses on getting young people interested in technology and sustainability. We also feel a growing responsibility for people who are marginalised in the employment market. This section explains more.


At the back of this annual report is the GRI chart that offers insight into the location that CSR topics can be found. This section along with *Personnel* in the section *Operations* have been verified by KPMG (see Auditor's statement). These aspects, part of corporate social responsibility, are geared to the TNO organisation whereby TNO has opted to leave the companies that have emerged from TNO outside the scope of the CSR policy in order to allow these companies to operate as independently of TNO as possible. The reporting period is from 1 January 2013 through to 31 December 2013. In the annual report of 2012 TNO took part for the second time in the transparancy benchmark for social reporting as organised by the Ministry of Economic Affairs and this year we are doing the same.

The new vision of CSR for 2013-2018 has three main components: society, organisation and employee (see below).

**SOCIETY**

The mission of TNO is to help solve major societal and economic issues. The intrinsic topics of the core business are charged to the theme directors. The CSR steering group contributes through the activities below.

**Societal impact**

To make the impact of TNO on societal issues explicit and measurable, the CSR steering group wanted to support the discussion on at least two sustainability issues with new facts, but the topics grew as you can read in *Impact in Public Debate*. We were especially visible in the year under review in the shale gas debate (see example elsewhere in this report), a much discussed topic within TNO.

An internal session was organised to share various perspectives. It is the aim of the organisation and the Board of Management to discuss openly various perspectives on societally and politically sensitive topics.

***Shared Value Creation***

Shared Value is connecting social and business values. Together with the SEAL institute we performed a study to make the concept of Shared Value creation more tangible and applicable for TNO projects, developing a framework that will be elaborated and put more into practice in 2014. Within TNO Shared Value creation is important for leadership, our KPIs and 'Business-of-Value model'.

***Tool for project leaders***

With support from the CSR officer, the director of M&C and the expertise director of ELSS, a group of young TNO trainees developed a method to encourage and monitor CSR within projects by undertaking an extensive analysis of existing guidelines and, following interviews with stakeholders within TNO and external organisations, producing a strong CSR policy and thus facilitating the discussion on the people, planet and profit aspects of knowledge projects. In February 2014 a pilot within the Smart Mobility expertise group will begin to test the method in practice and also create support within TNO.

**Innovation for Development**

TNO also realises impact in developing countries and emerging economies. Growth of the world's population to nine billion means significant demand for food, energy and resources. Lowest-income groups in developing countries will be the first to suffer from any scarcity while, at the same time, many countries will make huge economic strides. The potential for consumers and producers is considerable.

To find solutions for energy, water and food demand, among other things, innovation is needed. There is also a need for innovations for the right market insights, specific business models and strategies for scaling up in developing countries. TNO contributes knowledge to this and co-creates promising business models with industry. We realise system innovations

together with Dutch, local and international companies, NGOs, knowledge institutions and governments. For the poorest in developing countries this means more wellbeing, entrepreneurship and revenue. For industry assignments with both revenue and social impact for the consumer. For TNO societal impact, revenue, international networks for new knowledge and innovation along with a sense of accomplishment for TNO employees contributing to a better world.

The 'Innovation for Development' programme has more than twenty projects, mainly in Africa and Asia, that focus on renewable energy and climate, mobile services and ICT, food security, drinking water, mother-and-child care and sustainable production. For more information, see the website **TNO.NL/I4D**. We also undertake consultancy and secondment for two Dutch NGOs, thereby participating in projects totalling a value of 16 million euros and revenue of TNO 2.5 million euros.

**Social return**

For years TNO has been actively inspiring young people to take an interest in technology and sustainability. We also want to pursue policy aimed at those marginalised in the employment market. TNO employees that advise the government on *social return* have got this item higher on the agenda of the CSR steering group. In 2013 this had not produced any concrete policy in part through the loss of jobs but in 2014 this policy will take further shape.

TNO offers talented starters the possibility and scope to develop through a traineeship. There are now 20 trainees who serve three times eight months in a different department. Ultimately 90% of the trainees opts to work at TNO after completing the programme.

| SOCIETY | | | | |
|---|---|---|---|---|
| **Topic** | **Target 2013** | **Realised in 2013** | **Target 2014** | **Target 2018** |
| Societal impact | TNO raises at least two discussions on sustainability themes aith new facts and vision | Energy (including the energy system, shale gas), circular economy, resources policy and innovation for health | TNO raises at least two discussions on sustainability themes aith new facts and vision | TNO raises discussions on five major sustainability themes new facts and vision |
| | Developing *Shared Value* creation instrument | Reporting is complete | Creating support | Societal impact can be made measurable and visible |
| | Tool for project leaders: sustainability in all projects; start of pilot | Trainee project is begun to arrive at an approach | Pilot at Sustainable Mobility research group; Adjusting tool for wide application within TNO | Societal impact can be made measurable and visible |
| Innovation for Development | Execute 10 projects; establish 3 new public-private partnerships; impact among 1 million people; 2.5 million euros revenue for TNO | 14 new projects and 5 ongoing projects; 3 new public-private partnerships; impact among around 1 million people; 2.75 million euros revenue for TNO | 15 projects; 3 new public-private partnerships established; impact among 1 million people; 3 million euros revenue for TNO | Social-economic impact among 5 million people with lowest incomes in developing countries and emerging economies through innovation |
| Social return | Develop policy for people marginalised in the employment market | Vision is being created, policy not yet ready | Finalise policy, start implementation | TNO has a responsible attitude to people marginalised in the employment market |
| | Focus on young people, technology and sustainability: Activate Jet-Net | Jet-Net and Girls Day activities | Boost commitment of TNO-ers for Jet-Net and Girls Day | TNO-ers help profile the possibilities among young people to opt for a career in technology and sustainability |

As in previous years TNO tries to interest young people in research and technology. We are affiliated to Jet-Net, the technology network for young people in the Netherlands. During the Geoweek pupils in their final year at primary school went on a discovery trip with the Geological Survey of the Netherlands, part of TNO, doing groundwater monitoring and drilling tests.

In 2013 TNO took part for the first time in Girls Day, a VHTO (national expertise agency for girls/women and science/technology) initiative aimed at making young girls aged 10 to 15 familiar with science/technology and ICT. At TNO's The Hague location 60 schoolchildren from The Hague joined various politicians and the then Princess Máxima for a look behind the technology scenes.

**THE ORGANISATION**

In the organisation we look at the internal processes, focusing on honest working and reducing the environmental impact of what we do.

**Integrity**

Working at TNO makes demands of people's integrity, such as handling research data and dilemmas in a conscientious way. The new TNO code was finalised in December 2013 by the Baord of Management and will be brought to the attention of employees in 2014. The code describes the core values, how to deal with dilemmas, doing business, science and research, CSR and ethics, people and organisation, structuring the organisation around integrity and how to keep the code alive. There is also a stipulation on dealing with social media. The code is based on best practices.

The section on science and research is based on the VSNU code because TNO wants to be aligned with the prevailing values and norms in the scientific Netherlands. Hence the reason for TNO considering affiliation to the LOWI (national body for scientific integrity), a research committee of the KNAW (the Royal Netherlands Academy for Sciences) that is able to assess scientific integrity, as a kind of professional body, by its merits. The TNO taskforce for scientific integrity advises the Board of Management on safeguarding the scientific integrity of TNO in line with prevailing standards.

In the spring of 2014 we are launcing an integrity platform that should serve as a tool to focus attention on the code. Practical tips for employees and managers as well as an interactive dilemma bank are components of this platform. The Integrity Officer appointed in January 2013 ensures that all integrity initiatives are coherently connected. He undertakes regular advisory interviews with employees and managers and spurs them on to take action to safeguard integrity. He advises on practical issues such as the risk of conflict of interests occurring and how to deal with such an eventuality. He acts as a confidant for higher management and trains employees and management in integrity and ethical judgement.

The Integrity Committee (formerly code of conduct committee), which met four times, examines whether the stipulations in the code are adequately and proposed changes to the processes andf procedures where necessary. The new policy on additional work activities has been drafted and will be finalised in 2014. New employees follow workshops on professional integrity at Nyenrode Business University.

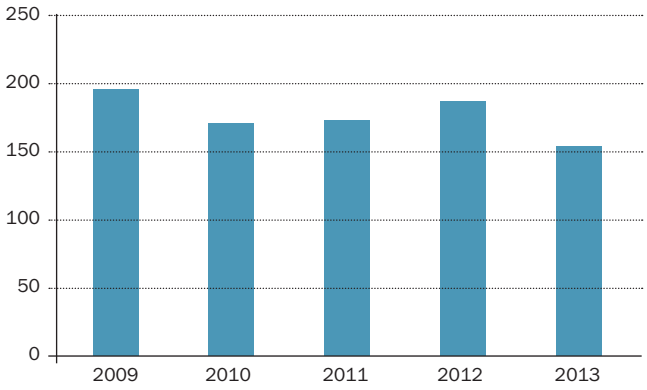
Unfortunately 2013 witnessed a few cases of our employees having acted contrary to our integrity principles. In three cases measures were taken against those employees. Finally, a network of confidants was established. They have been asked to 'apply' using new profiles so that they are available to discuss business and scientific integrity, etiquette and conscientious objections. Confidants were appointed in nine locations in the

| SOCIETY | | | | |
|---|---|---|---|---|
| **Topic** | **Target 2013** | **Realised in 2013** | **Target 2014** | **Target 2018** |
| Integrity | Strengthen integrity within TNO | New core values, set up dilemmas databank, etc. | Launch integrity platform, fill dilemmabank | Internal awareness and clarity on scientific integrity |
| Reduce environmental impact (namely $CO_2$) of own organisation | Reduce energy impact of buildings | Replace lamps, merge locations, energy scans | Take action following energy scans | 20% reduction in 2020 compared with 2012 |
| | Reduce own mobility emissions; set target, develop plan | Signing of Lean & Green statement of intent, adjusted lease contract | Elaborate Lean & Green plan and start implementation | 20% $CO_2$ reduction in 5 years |
| | Sustainable purchasing: sustainability plays a role in new TNO-wide contracts | Uotsource datacentres, new contract for company canteen, $CO_2$ compensation for gas emissions | Several new TNO-wide contracts with clear sustainability focus | TNO makes high demands of suppliers in respect of people, planet and profit qualities and cooperates with others in a number of sectors |

autumn. In 2014 a confidant for TNO's international employees will be appointed. Employees also have the opportunity to make use of external confidants. The Integrity Officer coordinates the network and ensures that the confidants have the required expertise by training and coaching them.

***Reduce environmental impact***

At the start of 2008 an environmental footprint was established for the first time, and repeated each year since, to gain a picture of our impact on the environment, looking at various effects such as greenhouse gases, acidification, fertilisation and toxicity. For 2013 it was decided to make a $CO_2$ footprint, in part to show comparisons with other organisations. The method used for calculating the footprint deviates from previous years although this $CO_2$ footprint has again been made for the entire production chain of energy, transport and products and services purchased. The figure on page 36 illustrates the $CO_2$ emissions. The calculation of scope 1 and 2 used the SKAO guideline. The approach and method are described in the document 'Explanation of $CO_2$ footprint' (see **TNO.NL/CSR**). Scope 1 (direct emissions) concerns emissions caused by the organisation and its vehicle fleet. For TNO this concerns 131 TerraJoule (TJ) of gas consumption and 18 TJ of fuel consumption (diesel and petrol) by lease drivers. Scope 2 (indirect emissions) are emissions that originate from the generation of the energy TNO purchases and business trips.




$CO_2$ emission (kilotonne)

| Scope | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|
| 1 | 13 | 11 | 11 | 10 | 9 |
| 2 | 28 | 25 | 26 | 27 | 24 |
| 3 | 155 | 134 | 135 | 150 | 120 |
| Total | 196 | 171 | 172 | 186 | 153 |

In kilotonne $CO_2$ emissions
KPMG gives no assurances for the figures for 2009 and 2010

Scope 3 contains the other indirect emissions. The total amount of TNO's $CO_2$ emissions in the year under review fell by 18% on 2012, the main fall in $CO_2$ emissions coming mainly in scope 3, miscellaneous indirect emissions. A major financial saving on purchase contracts in the context of the poorer financial situation of TNO happily translates into a significant drop in indirect $CO_2$ emissions. In a relative sense (per euros of revenue) the environmental impact of TNO also fell in 2013 compared to 2012.

Below we take a closer look at the explanation for this and the activities undertaken to reduce the impact.

***Energy and buildings***

In 2013 TNO consumed around 39.1 million kWh of electricity and 4.1 million $m^3$ gas, which is a fall of 5.4 million kWh of electricity and 0.2 million $m^3$ of gas consumption on 2012. The drop in electricity consumption is probably attributable to a fall in the number of employees, the disposal of a number of buildings and energy-saving measures.

Since 2010 TNO has purchased green energy for its energy needs in its own buildings and since 2013 TNO has also compensated $CO_2$ emissions caused by gas consumption with the purchase of 6413 tonnes of $CO_2$ emission rights (Gold Standard VER certificates). The environmental benefit of green energy and these $CO_2$ emission rights have not been deducted from the total. TNO Real Estate Management Works on sustainability through disposing of obsolete locations and taking energy-saving measures in other locations. In 2013 two decisions were taken on merging office locations during 2014 and 2015:

1. In Leiden – Schipholweg the merging of the Leiden – Wassenaarseweg and Hoofddorp – Polarisavenue locations.
2. In The Hague – Anna van Buerenplein the merging of the Delft – Schoemakerstraat and Delft – Brassersplein locations.

These mergers will more than halve the number of sqaure metres. In addition, both locations are close to large stations, which will favour the mobility of TNO.

At a large number of locations a start was made in 2013 on replacing obsolete fluorescent lighting – some 8000 fittings in offices and labs – by energy-efficient lighting. We substantiated our CSR policy by having the project carried out by disadvantaged workers. The saving will pay off within three years. The corridors will also be led-illuminated. In 2013 Cofely Energy Systems began energy scans of our buildings, a project due for completion at the beginning of 2014, using a method co-developed by TNO. A thermometer is inserted into the building, as it were, and the energy inefficiency detected. We have agreed an incentive with those contracted to do our daily maintenance work to further reduce the energy consumption in the TNO locations.

***Mobility***

For business travel in 2013 cars were responsible for 13.2 million kilometres coverd (2012: 14.6 million km) and air travel around 26 million kilometres (0.3 million less than in 2012). Commuting kilometers in 2013 totalled 32.4 million kilometres. In all, transport of goods and employees in 2013 accounted for 12% of TNO's $CO_2$ footprint. In 2013 the contract with the lease company was amended to include leasing electric cars.

As in previous years, TNO was involved in the mobility covenant 'Accessible Haaglanden' and the platform 'Smart Work, Smart Travel', aimed at reducing traffic jams. In order to make a purposeful step towards $CO_2$ savings in the next few years the director of Human Resources signed, on behalf of the CSR steering group, the Lean & Green statement of intent in November, committing TNO to saving 20% $CO_2$ emissions over five years for mobility.

*Sustainable purchase*

A few of the purchase projects in 2013 that had a positive impact on sustainability are:

- outsourcing two datacentres to energy-efficient environments;
- a new catering contract whereby at least half of the products is sustainable;
- greening natural gas consumption through the purchase of 6413 tonnes of $CO_2$ emission rights, Gold Standard VER certificates, project Basa Magogo, South Africa.

Embedding in the purchase process is good as are the results achieved but this should be more distinctive/innovative. The fact that the further exploitation and monitoring the results thus achieved lagged behind is related to the development of the contract management process and quite simply the lack of time due to other priorities. Firm embedding in the purchase process will create possibilities and conditions to bring sustainable purchasing to a more professional level.

## THE EMPLOYEE

Employees are the organisation's capital. It is essential for them to be dynamic, inspired, committed and diverse. Diversity boosts creativity and strengthens the power of innovation.

### Vitality

The Vitality working group was established with involvement from the Works Council, HR and management. At the start of 2013 we carried out a study of work stress within TNO among so-called starters, employees younger than 35 and less than five years at TNO. This revealed that 21.6% of the starters experienced work stress. The Dutch average is 12.8 %. The report on absence due to illness on 2012 that we received at the beginning of 2013 from Arbo Vitale showed that the percentage of absence due to illness at TNO had increased to just above 4%, which is double the national average of around 2%. So we actively pursued reducing absence due to illness and work stress among starters in 2013. TNO aims to get

| EMPLOYEE | | | | |
|---|---|---|---|---|
| **Topic** | **Target 2013** | **Realised in 2013** | **Target 2014** | **Target 2018** |
| Vitality | Reduce absence due to illness: lower or equal to 2012 = 4.1% | 3.9% | Reduce absence due to illness: lower or equal to 2013 | Dynamic employees: absence due to illness below norm (3.3%) |
| | Tackle work stress: plan, start employee vitality programme | Survey undertaken and communicated, Jong-TNO event | Jong-TNO event: get dialogue going; define tangible action for reduction | Dynamic employees: absence due to illness below norm (3.3%) |
| Diversity | Boost focus on behavioural aspects | Number of women in subtop and principal scientists lagging behind | Continue with internal awareness and dialogue | 30% in top, subtop and principal scientists, 40% at LD |

absence due to illness down to a maximum of 3% and reduce work stress among starters to a maximum of the national average of 12.8%, within three years at most. We are also gaining more insight into the roles, tasks and responsibilities connect with the Own Control Model, imparting knowledge of interventions to management and the prompt acquisition of adequate management information. In 2014 we will be working further on this with the new safety and health service, Arbo Unie.

***Reducing absence due to illness***

The aim is to reduce absence due to illness and thereby the costs and improve the working conditions and vitality of employees within TNO. The ultimate objective for TNO as a whole is:

- to reduce absence due to illness from 4.1% (2012) to amaximum of 3.3%;
- to reduce the frequency of absence;
- to reduce the share of psychic-related absence;
- to reduce the average duration of absence due to illness from van 13.7 days (2012) to a maximum of 10;
- to shift to more prevention;
- to exercise adequate control of damage costs relating to long-term absence and work disability influx;
- to improve the vitality of employees.

In 2013 a start as made towards achieving these targets, with close cooperation with Centraal Beheer Achmea, Zilveren Kruis Achmea and Arbo Vitale and a kick-off session with the management of departments that had a high rate of absence due to illness, followed by active coaching of these managers in a customised approach to dealing with these absenteeism dossiers. These programmes continue into the first quarter of 2014, after which a report will be drafted.

***Tackling the work stress of starters***

The aim is to reduce work stress among starters to the maximum national average of 12.8 % within three years at most. The results of the study were communicated via Life and JongTNO, in collaboration with the Vitality working group, in an event organised and supported by Jan Mengelers in a speech. In other words, work stress among starters is on the TNO agenda. In 2014 roundtable discussions were held to get the dialogue going between those involved on work stress and to come up with solutions to reduce work stress.

**Diversity**

In 2013 the diversity policy line taken in 2012 was continued, with our focus on ‘gender diversity’. To adjust the lopsided division in the (sub)top, we looked specifically at awareness and action geared towards boosting the share of women. The diversity steering group wants to make diversity an increasing component of the existing processes within the organisation. The target figures per category are in line with the previous year and on the basis of participation in the Charter, at the same level. These aims pose sufficient challenge.

Below are the targets and results per year:

Percentage of women, based on headcount

| Level | Realisation 2010 | Realisation 2011 | Realisation 2012 | Realisation 2013 | Plan 2014 |
|---|---|---|---|---|---|
| Top (Board, 1st/2nd ech) | 28.3% | 30.8% | 28.2% | 29.4% | 30% |
| Subtop (3rd ech) | 14.5% | 15.8% | 15.5% | 16.7% | 30% |
| Principals | N/A | 11.5% | 8.0% | 7.7% | 30% |
| LD potential | N/A | 36.4% | 39.4% | 40.4% | 40% |
| Total TNO | 33.3% | 30.0% | 30.7% | 30.6% | |

Of the 3215 employees 953 are women.

The number of women in the subtop of the organisation and the number of female principal scientists fall short of the targets, so nurturing women in these categories warrants extra attention. The absolute number of women with a technical background is, however, low. As a follow-up to the 2012 awareness programme all directors were asked in 2013 what their priority was in terms of diversity. The answers gave the Diversity steering group the basis for a plan for 2013-2014, which is to align with existing processes and initiatives within the organisation to ensure that diversity becomes more common and embedded.

The women's W@T network took various initiatives in the year under review, with two Lean-in workshops that gave us greater insight into mind bugs on diversity and how to deal with it. The participants were very positive in the assessment of the workshops. W@T generated firther inspiration through discussions with other organisations on lessons learned and best practices.

At the end of the year an internal communiation campaign focused on diversity within TNO. Employees gained insight into up-to-date figures, a number of directors explained their vision and ambition, and there were positive examples revealed of groups in which the diversity is considerable. 2014 is a transitional year for TNO towards a new strategic period 2015-2018, a year in which diversity must become more firmly implanted. The aim is to make diversity a self-evident component of daily practice and in normal processes.

## SUPPLEMENT

### Animal testing and alternatives

TNO contributes to the safety, efficacy and kinetics of food, medicines and chemicals to make them more predictable for humans. To this end we develop innovative models that replace, reduce or refine (3 Rs) the number of animal tests. But for some research questions, the answers must be found in animal testing. Ahead of the introduction of the Animal Testing Act, TNO is already acting in the spirit of the new law. Since 2010 we have employed new, tougher accommodation guidelines for laboratory animals. The TNO Triskelion animal testing facility has been awarded AAALAC accreditation (**www.aaalac.org**). The breeding of transgenic mice was further optimised, which led to an efficiency boost of 6% in 2013. We have taken the initiative to undertake joint audits with more than ten organisations among laboratory animal suppliers from 2014. To safeguard the quality of animal experiments TNO publications that describe such tests will be checked against international guidelines for laboratory animal research (**www.nc3rs.org.uk/page.asp?id=1357**). In cooperation with statisticians the best experimental set-up and the smallest number of animals necessary will be calculated and a 'calculator' developed for others wishing to use this method online. TNO actively contributes to the societal debate on animal testing and alternatives through the organisation of conferences. More information about our animal testing policy, animal testing annual report and the alternatives we develop can be found at: **www.dierproeven.tno.nl**.

### Defence research

Defence research within the theme Defence, Safety & Security is susceptible to dilemmas. The research focuses on safety and security and the protection of the Dutch armed forces as well as safety and security issues in society. Therefore, part of the research must be kept secret from society. The research programme for the Ministry of Defence is arrived at after close consultation between the respective ministry and TNO. The Council for Defence Research report explains this process.

# RISK CONTAINMENT FOR CHEMICAL SUBSTANCES

In the Netherlands alone, each year employees lose around 50,000 healthy years of life due to exposure to chemical substances, and some two thousand even die from the effects. To drastically reduce these figures TNO has been working with Arbo Unie and Ernst & Young (BECO) to develop a webtool for companies that work with hazardous substances: the *Stoffenmanager*. More than 20,000 people are already using it and the number is growing fast. This resource provides an easy way to gain good insight into the complex matter of chemical substances. Thanks to the thorough scientific substantiation, the *Stoffenmanager* has been certified by Dutch and European authorities. It is not surprising, therefore, that the tool has attracted international attention. Since 2013 the website has also been available in English, German and Finnish, allowing companies in those language-speaking areas to benefit worldwide. TNO is now co-developing with European institutes a special module on nanoparticles. The number of products containing such particles is growing rapidly while the scientific knowledge of the risks is still limited.

TNO innovation for life

# FINANCE

TNO closed 2013 at a loss of 14.5 million euros. This consolidated result includes a reorganisation expense of 13.6 million euros, 11.8 million euros of which concerns a reorganisation within the TNO Organisation due to changes in the revenue portfolio. The result for 2013, excluding this reorganisation expense, was a loss of 0.9 million euros and thus 2.2 million euros behind the target for 2013. Compared with the result for 2012 (loss of 9.6 million) this is a setback that was caused in part through lower net revenue of 7.6 million euros, lower miscellaneous operating revenue at 4.1 million euros, higher personnel expenses (including the reorganisation expense) at 2.5 million euros and a lower interest income balance, results of participations and other of 2.0 million euros. Against this were lower depreciation expenses of 10.2 million euros (specifically lower costs of extraordinary value depreciations) and lower miscellaneous operating expenses of 1.1 million euros.

**REVENUE**

The revenue of TNO – the TNO Organisation including its group companies – fell by 22.9 million euros on 2012 to 564.1 million euros, a fall that is attributable to:

- less government funding at 11.8 million euros. Government funding revenue fell from 192.3 million euros in 2012 to 180.5 million euros in 2013 as a result of the government's structural multi-year budget cuts;
- less market revenue at 11.1 million euros, with domestic revenue down by 14.1 million euros and foreign revenue up by 3 million euros. Market revenue fell from 394.7 million euros in 2012 to 383.6 million euros in 2013. Market revenue thus makes up 68% of the total revenue (2012: 67%).

**OPERATING EXPENSES**

Personnel expenses rose by 2.5 million euros, mainly due to the higher contributions to personnel provisions of 10.3 million euros. Against this the costs of temporary personnel were lower at 9.5 million euros. The miscellaneous operating expenses fell by 1.1 million euros on 2012 and represent the balance of over- and underspending for various debit items.

Depreciation charges fell by 10.2 million euros on 2012, 9.0 million euros of which can be attributed to the fact that there were no extraordinary value depreciations in 2013. The other depreciation items saw a fall of 1.2 million euros.

**CASH AND CASH EQUIVALENTS**

At the end of 2013 the balance of cash and cash equivalents stood at 118.7 million euros, 1.8 million euros lower than at the end of 2012. This fall was caused by cash outflows from investment activities and a cash outflow of 27.2 million euros along with a cash outflow of 0.3 million euros from financing activities. Against this was an incoming cash flow of 25.7 million euros from operating activities.


# TRUCKS WITHOUT DRIVERS

Driverless trucks on the road in five years time? Yes, if it were up to TNO. The modern technologies developed by TNO make this technically possible. In 2013 TNO demonstrated how safe automatic driving is and, to prove it, the Dutch Minister of Infrastructure and the Environment, Melanie Schultz, successfully drove in the first automated car on the Amsterdam motorway in November. TNO is working on a comparable concept for trucks that will drive without a driver in columns. We begin simply. One truck drives closely behind another as the two trucks use wireless technologies to communicate with each other. That already makes a difference of 10 to 20 per cent on fuel consumption and just as much in $CO_2$ emissions. Traffic flow is improved and so traffic jams are reduced. Because the second truck needs no driver, transport firms save on personnel costs. The sector is enthusiastic as are the government and truck manufacturers. The technology has already been developed by TNO and the business case looks good. Now it's time to put it to the test. TNO is quickly bringing smart, efficient, safe and green road transport closer.

TNO innovation for life

# INDEPENDENT ASSURANCE REPORT

**TO THE READERS OF THE ANNUAL REPORT 2013 OF THE NETHERLANDS ORGANISATION FOR APPLIED SCIENTIFIC RESEARCH TNO**

We have been engaged by the Board of Management of the Netherlands Organisation for Applied Scientific Research TNO (hereafter: TNO) to provide Assurance on the information in the 'Responsible and Dynamic' section and the 'Personnel' subsection in the Annual Report 2013 (hereafter: sustainability information). The TNO Board of Management is responsible for drafting the sustainability information, including the identification of material issues and the establishment of the GRI application level. Our responsibility is to issue an assurance report on the sustainability information on the basis of our engagement described below.

**SCOPE**

Our engagement was to provide a limited degree of certainty that the sustainability information, in all material respects, is represented in accordance with the G3.1 reporting criteria of the Global Reporting Initiative and supplementary internal definitions. Information relating to the sustainability performance of TNO Bedrijven B.V. participations was excluded from our engagement. The work performed in providing a limited degree of assurance focused on establishing the plausibility of information and is therefore less extensive than would have been in providing a reasonable level of assurance. We provide no assurance on the feasibility of the goals, expectations and aims of TNO.

**REPORTING CRITERIA**

In preparing the sustainability information TNO applies the Sustainability Reporting Guidelines (G3.1) of the Global Reporting Initiative (GRI), supported by internal definitions as explained in the subsection 'Management and Reporting' and in the GRI chart. The sustainability information must be seen in the light of this explanation.

**ASSURANCE STANDARD**

We conducted our engagement in accordance with Standard 3410N 'Assurance Engagements relating to Sustainability/ Societal Reports' issued by the Netherlands Institute of Chartered Accountants. This Standard includes requirements that the assurance team possesses the specific knowledge, skills and professional competencies needed to understand the information in the CSR section and to be able to identify and collect assurance information required and that they comply with the requirements of the Code of Ethics for Professional Accountants of the International Federation of Accountants to ensure their independence.

**WORK PERFORMED**

Our work included:

- performing a risk analysis, including a media analysis to deepen our insight into the relevant sustainability aspects for TNO during the reporting period;
- evaluating the suitability of the reporting guidelines including the conversion factors used;
- interviewing management and relevant employees responsible for the sustainability policy;
- evaluating internal and external documentation, on the basis of sample observations, to establish the extent to which the sustainability information is adequately substantiated.

We also ascertain as far as possible whether the information in the other parts of the 'TNO Annual Report 2013' is consistent with the sustainability information.

During our work we verified the necessary changes in the sustainability information with TNO and established that such changes have been adequately incorporated in the definitive version.

**CONCLUSION**

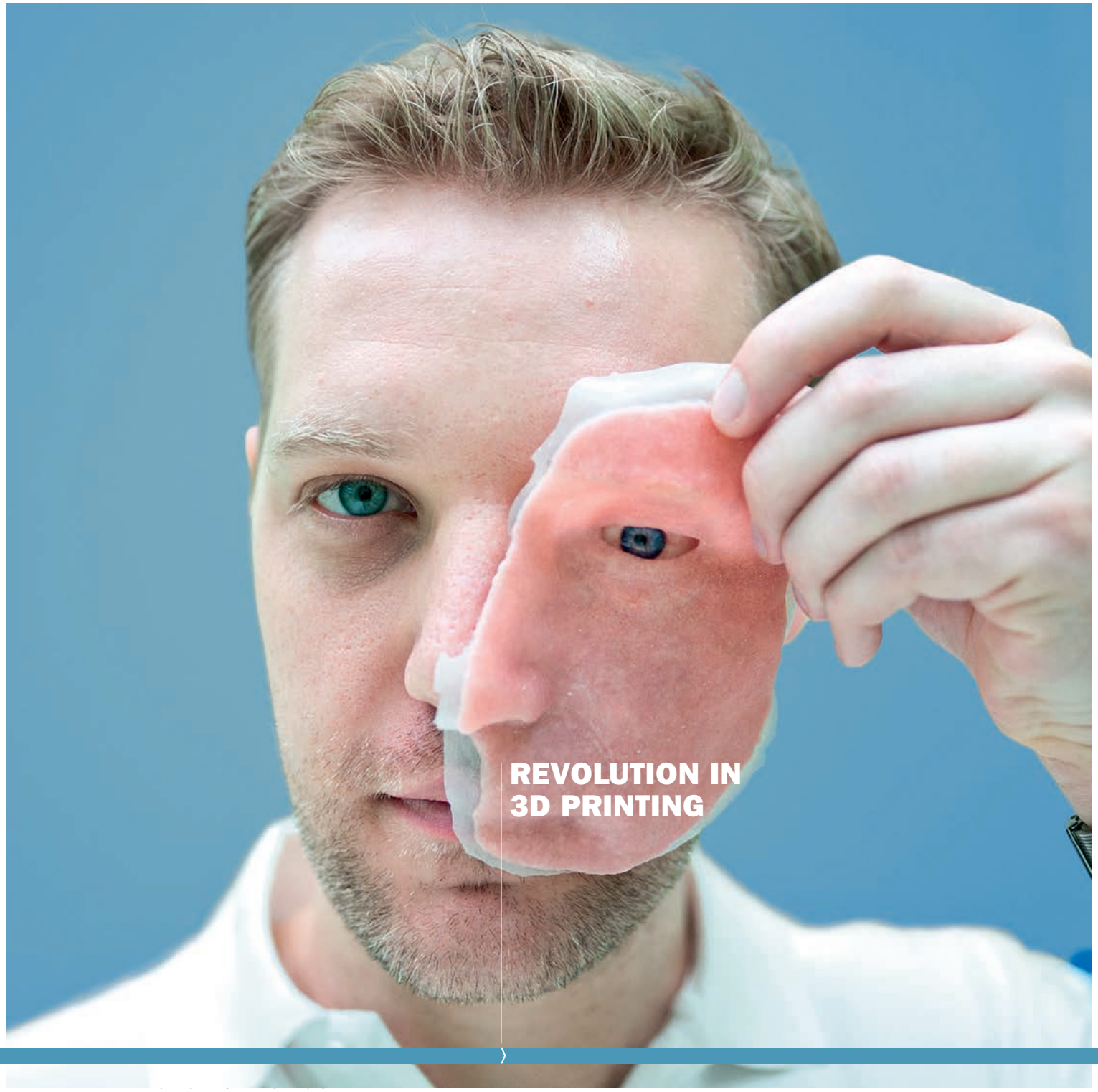
Our work reveals that the sustainability information is not incorrectly represented in all its material aspects in accordance with the G3.1 guidelines of the Global Reporting Initiative.

**REPORTING REGARDING COMPATIBILITY OF THE ANNUAL REPORT WITH THE SUSTAINABILITY INFORMATION**

We also report that as far as we can ascertain that the information in the other parts of the 'TNO Annual Report 2013' is compatible with the sustainability information.

Rotterdam, 19 March 2014
KPMG Accountants N.V.

T.A. Kalmár RA



# REVOLUTION IN 3D PRINTING

TNO is developing a new generation of 3D printers, christened Print Valley, which will be the factory of the future. They will soon be manufacturing personalised products like dentures, hearing aids, artificial hips, clothing or jewellery locally, quickly and on a large scale. The range of materials that can be used is endless. In the Netherlands TNO has been the forerunner since the 1990s in 3D printing, or additive manufacturing. We work closely with innovative small and medium-sized companies, who are then able to tap into new markets. Our aim is to co-develop this highly promising new technology with industry into a mature production technology for high-tech, high-precision and high-complexity applications. TNO has managed to add more and more materials for use in 3D printers, resulting in the manufacture of complex composite products. Like printed food. Our revolutionary 3D food printer will soon be making quick, customised, on-the-spot meals at home, in a restaurant or in the kitchens of nursing homes. Substance, ingredients, composition, shape, colour: every variation is possible. So a hospital will be able to make hundreds of different meals, each with the exact ingredients that every individual patient needs.

TNO innovation for life

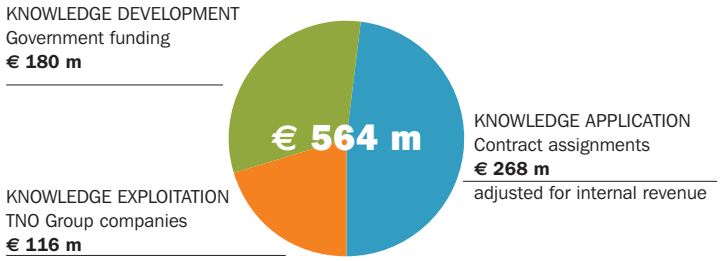
# THE TNO PROFILE IN 2013

In 2013 total consolidated revenue fell by 23 million euros to 564 million euros (see graph 1). A third of this, 180 million euros, was made available via government funding for the development of new knowledge. The share of knowledge development via the demand-driven programmes 'Cooperative Resources Research' (SMO), 'Enabling Technology Programmes' (ETP) and Task Funding is shown in graph 2.

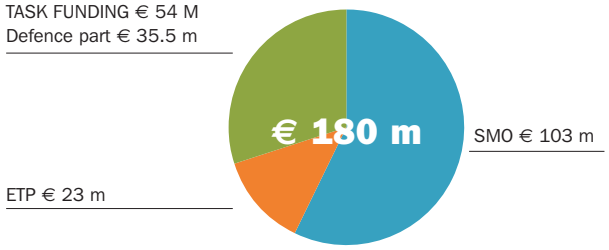
The market revenue of 384 million euros comprises 279 million euros from contract assignments in the seven themes and the expertise areas: this knowledge application is based on the distinctive position the themes have built up via the aforementioned demand-driven research (the knowledge development). Graph 3 shows the division of the market revenue across Dutch industry (35 per cent), international (41 per cent) and Dutch government (24 per cent).

Of the total market revenue 116 million euros relate to knowledge exploitation by or through the 42 or so companies within TNO Bedrijven B.V. This is the consolidated revenue of the group companies in which TNO has a holding of more than 50 per cent. This knowledge exploitation is not government funded and is therefore contained within a separate private limited company structure. These companies are normally created from spin-off or spin-out activities within TNO. The total international revenue of the themes, expertise areas and TNO Bedrijven B.V. rose in 2013 to 157 million euros.

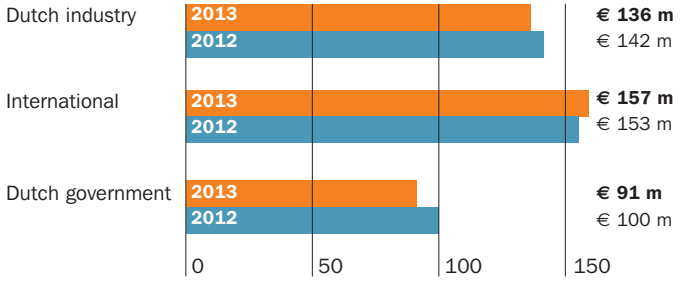
**1. CONSOLIDATED REVENUE TNO 2013** (€ 564 million)
incl. revenue TNO group companies
Consolidated group companies (>50% holding)
2013 = €116 million




**2. TNO GOVERNMENT FUNDING 2013** (€ 180 million)




**3. CONSOLIDATED MARKET REVENUE 2013** (€ 384 million)



# FROM INVENTION TO GLOBAL PRODUCT

At TNO experts in all kinds of field constantly conceive and design innovations that enable companies to make new products or services. But sometimes a few of those inventions are kept to one side because either the company or the market is not quite ready for them yet. So once a year we present some twenty ideas at the special 'Technology seeks entrepreneur' day in the hope that some of the hundreds of SMEs there can make something out of these ideas. A nice example is the Technology of Sense company that was impressed by our optical system to measure the quantity, location and cause of contaminating minuscule dust particles in real time.
The current methods are slow and laborious. For cleanrooms in industry, clinical labs and operating theatres in hospitals it is vital to be able to immediately and precisely dust particles. Together with TNO the company developed the idea at rapid speed into an actual product that is now conquering the world. In the words of director Jan Gerbrands: 'TNO is the best thing to happen to us in years.'

TNO innovation for life

# KEY FIGURES

**TNO: (ORGANISATION TNO INCL. GROUP COMPANIES)** *(in EUR × million)*

| | 2013 | 2012 | 2011 |
|---|---|---|---|
| **Result** | | | |
| **Operating income** | 579.0 | 606.0 | 598.9 |
| of which revenue | 564.1 | 587.0 | 577.0 |
| of which other operating income | 14.9 | 19.0 | 21.9 |
| **Breakdown of revenue** | | | |
| Market revenue | 383.6 | 394.7 | 388.1 |
| Demand-driven research (government funded) | 180.5 | 192.3 | 188.9 |
| **Expenses** | | | |
| Operating expenses | 593.4 | 617.4 | 599.0 |
| of which personnel expenses | 381.7 | 379.2 | 372.3 |
| Exceptional value depreciations | - | 9.0 | - |
| **Net result** | –14.5 | –9.6 | 0.4 |
| Revenue per employee in EUR × 1000 [1] | 134.3 | 134.7 | 133.6 |
| **Cash flow for financial year** | –1.8 | –19.5 | 7.4 |
| **Capital** | | | |
| Capital employed [2] | 235.9 | 251.1 | 270.7 |
| Equity | 165.9 | 180.4 | 190.0 |
| Solvency [3] | 0.41 | 0.44 | 0.42 |
| **Assets** | | | |
| Property, plant and equipment | 191.1 | 197.1 | 220.7 |
| Additions to property, plant and equipment | 25.5 | 21.9 | 21.6 |
| **Employees** | | | |
| Average number of employees | 3,895 | 3,892 | 3,932 |

1) Revenue per employee = revenue divided by total capacity

2) Capital employed = total assets – current liabilities

3) Solvency = equity divided by total capital

# CONSOLIDATED BALANCE SHEET

AT 31 DECEMBER 2013

after treatment of the loss *(in EUR × thousand)*

| | | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|---|
| **Non-current assets** | | | | |
| Intangible assets | 1 | 4,808 | | 3,633 |
| Property, plant and equipment | 2 | 191,064 | | 197,112 |
| Financial assets | 3 | 6,807 | | 7,113 |
| | | **202,679** | | **207,858** |
| **Current assets** | | | | |
| Inventories | 4 | 3,324 | | 1,562 |
| Receivables | 5 | 76,612 | | 81,977 |
| Cash and cash equivalents | 6 | 118,677 | | 120,536 |
| | | **198,613** | | **204,075** |
| **Total** | | **401,292** | | **411,933** |
| **Equity** | | | | |
| – General reserve | 7 | 77,832 | | 96,368 |
| – Statutory reserve | 8 | 9,249 | | 7,772 |
| – Appropriated reserves | 9 | 78,863 | | 76,332 |
| | | **165,944** | | **180,472** |
| **Non-controlling interests** | | 685 | | 602 |
| **Investment grant equalisation account** | 10 | 31,009 | | 34,759 |
| **Provisions** | 11 | 20,278 | | 15,815 |
| **Long-term liabilities** | 12 | 17,976 | | 19,482 |
| **Current liabilities** | 13 | 165,400 | | 160,803 |
| **Total** | | **401,292** | | **411,933** |

# CONSOLIDATED INCOME STATEMENT

*(in EUR × thousand)*

| | | 2013 | | 2012 |
|---|---|---|---|---|
| Revenue | 14 | 564,125 | 587,020 | |
| Other operating income | 15 | 14,924 | 19,024 | |
| **Operating income** | | | 579,049 | | 606,044 |
| Direct project costs | 16 | –73,825 | –89,078 | |
| *Employee expenses* | 17 | –381,667 | –379,183 | |
| *Amortisation* | | –1,921 | –778 | |
| *Depreciation* | 18 | –25,192 | –27,551 | |
| *Impairment of property, plant and equipment* | | - | –9,000 | |
| *Other operating expenses* | 19 | –110,748 | –111,835 | |
| **Operating expenses** | | | –593,353 | | –617,425 |
| **Operating loss** | | | **–14,304** | | **–11,381** |
| Interest income | | | 1,771 | | 2,670 |
| Interest expense | | | –1,310 | | –1,256 |
| **Result on ordinary activities before tax** | | | **–13,843** | | **–9,967** |
| Tax | | | –30 | | –244 |
| Result of participating interests | 20 | | –324 | | 706 |
| **Result on ordinary activities after tax** | | | **–14,197** | | **–9,505** |
| Non-controlling interests | | | –269 | | –56 |
| **Net result** | | | **–14,466** | | **–9,561** |
| **Treatment of the loss** | | | | | |
| **Net result** | | | **–14,466** | | **–9,561** |
| Addition to: | | | | | |
| – appropriated reserve for civil operating risks | | - | | - | |
| – appropriated reserve for defence operating risks | | - | | - | |
| – staturory reserve | | –1,477 | | –2,592 | |
| – appropriated reserve for Defence buildings | | –3,163 | | –10,349 | |
| | | | –4,640 | | –12,941 |
| Withdrawal from: | | | | | |
| – appropriated reserve for civil operating risks | | - | | - | |
| – appropriated reserve for defence operating risks | | - | | - | |
| – staturory reserve | | - | | - | |
| – appropriated reserve for Defence buildings | | 632 | | 1,068 | |
| | | | 632 | | 1,068 |
| **Result after movements in appropriated reserves** | | | **–18,474** | | **–21,434** |
| Movement in general reserve | | | 18,474 | | 21,434 |
| | | | **-** | | **-** |

# CONSOLIDATED CASH FLOW STATEMENT AND STATEMENT OF OVERALL RESULT FOR 2013

## CONSOLIDATED CASH FLOW STATEMENT

*(in EUR × thousand)*

| | 2013 | | 2012 | |
|---|---|---|---|---|
| Net result | –14,466 | | –9,561 | |
| Non-controlling interests' share in the result | 269 | | 56 | |
| Group result | –14,197 | | –9,505 | |
| Depreciation and amortisation | 27,113 | | 28,329 | |
| Impairment of property, plant and equipment | - | | 9,000 | |
| Results of participating interests included in the result | –387 | | –46 | |
| Gains and losses on disposals of property, plant and equipment | 136 | | –413 | |
| Movement in provisions | 4,463 | | –3,491 | |
| Movement in working capital excluding cash and cash equivalents | 8,297 | | –20,947 | |
| Dividends received | 272 | | 200 | |
| **Cash flow from operating activities** | | **25,697** | | **3,127** |
| Investment in intangible assets | –3,100 | | –2,652 | |
| Investment in property, plant and equipment | –25,466 | | –21,910 | |
| Investment in financial assets | –1,336 | | –1,210 | |
| Disposals of intangible assets | 4 | | 228 | |
| Disposals of property, plant and equipment | 911 | | 2,237 | |
| Sale of participating interests and repayments received | 1,757 | | 1,163 | |
| **Cash flow from investing activities** | | **–27,230** | | **–22,144** |
| Investment grants received/repaid | 1,339 | | 1,436 | |
| Borrowings | - | | - | |
| Repayment of borrowings | –1,603 | | –1,955 | |
| **Cash flow from financing activities** | | **–264** | | **–519** |
| **Cash flow for the financial year** | | **–1,797** | | **–19,536** |
| Cash and cash equivalents at 1 January | | 120,536 | | 140,069 |
| Cash flow for the financial year | | –1,797 | | –19,536 |
| Exchange gains and losses | | –62 | | 3 |
| **Cash and cash equivalents at 31 December** | | **118,677** | | **120,536** |

| **Statement of overall result** | **2013** | **2012** |
|---|---|---|
| Consolidated net result after tax | –14,466 | –9,561 |
| Translation differences reserve | –62 | 3 |
| **Overall result** | **–14,528** | **–9,558** |

# NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

## ACCOUNTING POLICIES

### 1.1 GENERAL

TNO connects people and knowledge to create innovations that boost the sustainable competitive strength of industry and the wellbeing of society. TNO's registered office is in Delft.

**Reporting period**

These financial statements have been prepared for a reporting period of a calendar year.

**Standards used**

TNO's financial statements have been prepared in accordance with the Guidelines for Financial Reporting for TNO issued by the Minister of Education, Culture and Science. These guidelines are based on Part 9 of Book 2 of the Netherlands Civil Code.

The Minister of Education, Culture and Science issued a supplementary order that Dutch Accounting Standard RJ 271 'Employee benefits' does not apply to TNO.

The accounting policies are based on the historical cost convention.

**Valuation principles**

To comply with the law on the normalisation of salaries for top officials in the (semi)public sector (WNT), TNO adheres to the policy regualtions for applying WNT and uses this as its convention in drafting the financial statements.

**Comparative figures**

The figures for 2012 have been restated where necessary to improve comparison with the figures for 2013.

### 1.2 ACCOUNTING POLICIES

Unless stated otherwise, assets and liabilities are recognised at face value.
An asset is recognised in the balance sheet when it is probable that future economic benefits will flow to the entity and their value can be measured reliably. A liability is recognised in the balance sheet if it is probable that its settlement will result in an outflow of resources from the entity and their value can be measured reliably.

Income is recognised in the income statement if there has been an increase in economic potential related to an increase in an asset or a decrease in a liability that can be measured reliably. Expenses are recognised if there has been a decrease of the economic potential related to a decrease in an asset or an increase in a liability that can be measured reliably.

If a transaction leads to all or substantially all future economic rewards in an asset or all or substantially all economic risks in a liability being transferred to a third party, that asset or liability is no longer recognised in the balance sheet. Furthermore, assets and liabilities are no longer recognised in the balance sheet from the time that they do not comply with the conditions on the probability of future economic benefits and reliability of measurement.

Costs are attributed to the period to which they relate.

The financial statements are presented in euros, the functional currency of the entity. All financial information in euros is rounded to the nearest thousand.

In preparing the financial statements, management used judgements, estimates and assumptions which affect the application of the accounting policies and the reported amounts of assets and liabilities, and of income and expenses.

The actual results could differ from these estimates. The estimates and underlying assumptions are constantly reviewed. Changes in estimates are recognised in the period in which the estimate is revised. If the revision also affects future periods, the change is made prospectively in the relevant periods.

### 1.3 BASIS OF CONSOLIDATION

The consolidated financial statements incorporate the financial information of the TNO Organisation, its group companies and other legal entities over which it exercises control or central management. Group companies are participating interests in which the organisation has a majority interest or where it can otherwise exercise significant influence over policy. Potential voting rights in financial instruments which can be exercised immediately are also taken into account when determining whether significant influence exists. Participating interests held for disposal are not consolidated.

Newly-acquired participating interests are recognised from the date on which significant influence can be exercised. Participating interests that have been disposed of are consolidated until the date on which that influence no longer exists. Intercompany payables, receivables and transactions are eliminated in the consolidated financial statements. Group companies are fully consolidated and non-controlling interests are disclosed separately.

A list of consolidated group companies and non-consolidated participating interests is presented in the notes to the separate financial statements.

Certain majority-owned participating interests (TNO International Agencies B.V., ConsumersVoice B.V., TNO Science & Technology Consultation Co. Ltd and NMI UK Ltd) are not consolidated as their operations are not material.

### 1.4 FOREIGN CURRENCY TRANSLATION

**Transactions in foreign currencies**

Transactions denominated in foreign currencies are translated into the functional currency of the group company at the exchange rate prevailing on the date of the transaction. Monetary assets and liabilities denominated in foreign currencies are translated into the functional currency at the exchange rate prevailing on the reporting date. Foreign currency exchange differences that arise on translation are recognised through the income statement.

**Operations in other countries**

Assets and liabilities arising on operations abroad, including goodwill and fair value adjustments arising on consolidation, are translated into euros at the exchange rate prevailing on the reporting date. Income and expenditure from foreign operations are translated at the average exchange rate for the reporting period.

Foreign currency exchange differences are recognised through the translation differences reserve. If all or part of a foreign operation is sold, the related amount is transferred from the translation differences reserve to the income statement.

### 1.5 FINANCIAL INSTRUMENTS

Financial instruments comprise (other) receivables, funds, loans and other financing obligations, trade debts and other payable items.

Financial instruments also contain contracts with closed derivatives that are separated by the company from the basic contract and accounted for separately if the economic features and risks of the basic contract and its closed derivative are not closely related, if a separate instrument with the same terms and conditions as the closed derivative in the contract should comply with the definition of a derivative and the combined instrument is not valued at actual value in the processing of value changes in the income statement.

Financial instruments, including the derivatives separated from the base contracts, are valued at actual value upon the first withdrawal whereby the premium/discount and direct accountable transaction costs are incorporated in the first withdrawal. If in the subsequent valuation instruments are not valued at actual value with the processing of value changes in the income statement, any direct accountable transaction costs will be part of the first valuation.

Contracts containing closed financial instruments not separated from the basic contract are processed in accordance with the basic contract. After the first withdrawal the financial instruments are valued in the manner described below.

**Loans receivable, other receivables, borrowings, creditors and other payables**

These financial instruments are measured at amortised cost using the effective interest method. The effect of discounting short-term receivables and liabilities where no explicit interest rate is calculated and which have a short maturity is generally insignificant. Face value is used as amortised cost for these items.

**Derivative financial instruments**
Derivative instruments are measured at the lower of cost and market value unless hedge accounting using the cost hedge model is applied.

TNO makes only limited use of forward exchange transactions to hedge currency risks related to purchase and sale transactions. Cost hedge accounting is applied if currency contracts are taken out to hedge monetary assets and liabilities. Hedge accounting is applied to ensure that results recognised on the translation of monetary items through the income statement are offset by changes in value on the currency contracts at the spot rate on the reporting date. The difference between the spot rate on the closing date of the forward exchange contract and the forward rate is amortised through the income statement over the term of the currency forward contracts.

One TNO group company uses interest rate swaps to hedge interest rate risks from changes in interest rates on long-term loans. Cost hedge accounting is applied if interest rate swaps are taken out to hedge interest rate risks to ensure that the net interest expense recognised in the income statement is not subject to changes in interest rates. The recognised interest expense, therefore, comprises the net amount of the interest paid to financiers, and the gains and losses on the interest rate swaps taken out.

If cost hedge accounting is applied, initial recognition is at fair value. The derivative is not remeasured while it relates to hedging the specific risk in a forecast transaction. As soon as the forecast transaction results in recognition through the income statement, the gain or loss associated with the derivative instrument is recognised through the income statement. If the hedged position of a forecast transaction results in recognition of a non-financial asset in the balance sheet, the entity brings the cost of this asset into line with the hedging results not recognised through the income statement. A percentage loss greater than the amount of the derivative instrument compared with the hedged position is recognised directly in the income statement at the lower of cost and market value.

If a derivative instrument expires or is sold, the hedging relationships are terminated. The cumulative gain or loss not recognised in the income statement up to that time is recognised as an accrual or prepayment in the balance sheet until the hedged transactions occur. If the transactions do not occur as expected, the cumulative gain or loss is transferred for recognition through the income statement.

TNO documents the hedge relationships in specific hedge documentation and periodically assesses their effectiveness by establishing that there is no over-hedging.

**1.6 INTANGIBLE ASSETS**
Goodwill is the excess of the acquisition price for a participating interest over the TNO Organisation's share in the net fair value of the acquiree's identifiable assets and liabilities, less accumulated amortisation and impairment. Goodwill is amortised over the expected economic life of the acquired participating interest, which does not generally exceed five years.

The other intangible fixed assets relate to development costs and are capitalised insofar as they relate to projects considered commercially feasible whereby it is considered to be technically feasible to fulfil the asset, the company intends to fulfil the asset and subsequently use or sell it (including the available adequate technical, financial and other resources to effect this), the company has the capacity to use or sell the asset, will generate likely future economic benefits and reliably ascertain spending during the development. Development costs are valued at the manufacturing price less cumulative depreciation and extraordinary value depreciation. They contain mainly the salary costs of the personnel involved and knowledge bought in from third parties or the costs of third-party research and development, licence rights and software programs; the capitalised costs are written off after the end of the development phase over the expected duration of use, which does not, in principle, exceed five years. Depreciation is linear.

Capitalisation only occurs if it can be reasonably expected that these costs can be covered by future income.

**1.7 PROPERTY, PLANT AND EQUIPMENT**
Property, plant and equipment is measured at the cost of acquisition or, if produced in-house, at the cost of manufacture less accumulated depreciation based on the expected economic life and impairment.

Depreciation is calculated as a percentage of cost using the straight-line method over the economic life of the asset. Land, assets under construction and prepayments on property, plant and equipment are not depreciated.

### 1.8 FINANCIAL ASSETS

Participating interests where significant influence can be exercised over commercial and financial policy are measured using the equity method based on net asset value determined using the accounting policies of the TNO Organisation. Participating interests with an equity deficit are recognised at nil. A provision is formed if the entity has guaranteed the liabilities of the participating interest, charged initially against amounts receivable from that participating interest and subsequently against provisions to an amount equivalent to the share of the losses incurred by the participating interest or the payments the TNO Organisation expects to make on its behalf. Participating interests where no significant influence can be exercised are recognised at the lower of cost and recoverable amount.

Loans to non-consolidated participating interests are recognised at amortised cost using the effective interest method less impairment.

Dividends are recognised in the period in which they become payable. Interest income is recognised in the period to which it relates using the effective interest rate for the asset. Gains or losses are recognised as financial income and expense.

### 1.9 IMPAIRMENT

Non-current assets with a long life are tested for impairment if changes or circumstances occur that suggest that the asset's carrying amount will not be recovered.

The recoverability of assets in use is determined by comparing an asset's carrying amount with the estimated present value of the future net cash flows it is expected to generate. If an asset's carrying amount exceeds the estimated present value of future cash flows, impairment is recognised for the difference between the carrying amount and recoverable value.

### 1.10 INVENTORIES

Raw materials and consumables are recognised at the lower of cost and net realisable value, less any decreases in value at the reporting date.

### 1.11 WORK IN PROGRESS

Work in progress relates to assignments and is measured at the direct cost of the assignment (such as the costs for employees working directly on the assignment and costs of raw materials and consumables), overheads relating to assignment activities and attributed to the assignment and other costs that can be attributed to the customer under the contract. Expenditure related to the assignment costs that lead to work performed after the reporting date are recognised as assets if it is probable that they will generate income in a subsequent period. A provision is formed for expected losses on work in progress. Work in progress is recognised less instalments invoiced.

### 1.12 RECEIVABLES

The accounting policies for the measurement of receivables are described in the financial instruments section.

### 1.13 EQUITY

Financial instruments considered in terms of economic reality to be equity instruments are presented under equity. Financial instruments considered in terms of economic reality to be a financial liability are presented under payables.

Gains and losses on these financial instruments are recognised as income or expense in the income statement.

**Appropriated reserves**

Pursuant to Section 22 of the TNO Act and Articles 4 and 5 of the Guidelines for Financial Reporting for TNO, appropriated reserves can be formed for future expenditure or costs or to cover economic and technical risks. Withdrawals are charged to appropriated reserves in the appropriation of the result and may only be made if they correspond with the object of the reserve.

The appropriated reserve for civil operating risks is to cover economic and technical risks. When appropriating the result each year, the TNO Board of Management designates a percentage of both government and third-party funding and assignments to be added to the reserve until the reserve reaches its maximum amount. A maximum of € 9.1 million has been agreed with the government.

The appropriated reserve for Defence operating risks is based on specific agreements with the Ministry of Defence and is to cover risks related to executing additional funded defence assignments. A maximum of € 2.5 million has been agreed with the Ministry of Defence. The TNO Board of Management consults with the TNO Council for Defence Research on the amount to be added to the reserve each year when appropriating the result of the Defence, Safety and Security theme until the maximum amount of the reserve is reached.

The appropriated reserve for Defence buildings is to cover future investment in renovation and/or new building projects. Additions to and withdrawals from this reserve are made annually in the appropriation of the result on the basis of specific agreements with the Ministry of Defence.

### 1.14 NON-CONTROLLING INTERESTS

Non-controlling interests are measured at the share of third parties in the net asset value determined using the accounting policies of the TNO Organisation.

### 1.15 INVESTMENT GRANT EQUALISATION ACCOUNT

Funds provided by the government or third parties to compensate the TNO Organisation for investing in an asset are recognised as a liability in the balance sheet and released systematically to the income statement over the period in which the asset is in use.

### 1.16 PROVISIONS

A provision is recognised in the balance sheet if:

- there is a present legal or constructive obligation as a result of past events;
- of which a reliable estimate can be made; and
- an outflow of funds is likely to be needed to settle that obligation.

Provisions are measured at the face value of the expenditure expected to be required in order to settle the liabilities and losses or the present value of the expenditure.

The provision for social commitments covers benefits in payment and agreed future benefits to current and former employees of the TNO Organisation under TNO's employment conditions. The part that relates to pensions already in payment is based on actuarial calculations at a discount rate of 4%.

The claims provision is formed for possible liabilities from legal proceedings.

The restructuring provision is formed for the costs related to existing and pending reorganisations. The redundancy provision is formed for the expected costs of proposed terminations of employment contracts.

The provision for major maintenance is to smooth the cost of major maintenance on assets owned by the TNO Organisation and its group companies based on a long- term maintenance plan.

### 1.17 EMPLOYEE BENEFITS/PENSIONS

TNO has several pension schemes. The main one is a defined-benefit plan administered by Stichting Pensioenfonds TNO.

The Minister of Education, Culture and Science has issued an order that Dutch Accounting Standard RJ 271 'Employee benefits' does not apply to the TNO Organisation and accordingly the liabilities for pension scheme contributions are recognised as an expense in the income statement in the period in which they become payable. It is assumed that the pension charge for the reporting period is equal to the pension contributions payable to the pension fund. A liability is formed for any contributions payable at the reporting date. If the contributions already paid at the reporting date exceed the amount owed, a prepayment is recognised to the extent to which they will be refunded or settled by the fund against future contributions. A provision is also formed at the reporting date for existing additional obligations towards the fund or employees if an outflow of funds is likely to be needed to settle those obligations and a reliable estimate can be made of them. The existence of additional obligations is assessed from the administration agreement with the fund, the pension agreement with employees and other (explicit or implicit) commitments to employees. The provision is measured at the best estimate of the present value of the amounts needed to settle the obligations at the reporting date.

A receivable is recognised for a surplus in the pension fund at the reporting date if the surplus is at the disposal of the company, if it is likely to accrue to the company and if the receivable can be reliably measured.

### 1.18 CURRENT LIABILITIES

The measurement of current liabilities is explained in the section on financial instruments.

### 1.19 REVENUE RECOGNITION

Revenue is the total of:

- revenue from assignments;
- government funding.

Revenue from assignments is amounts invoiced for work performed, less any value added tax, and the movement in work in progress.

As there is a regular flow of projects spread evenly throughout the year and as they are generally completed within a year, profit on work in progress is recognised on completion.

The government funding received is used for the demand-driven programming for the Top Sectors and societal themes and accounted as revenue proportionate to the work performed. Direct project costs means the tangible costs (including outsourced work) directly attributable to a project.

### 1.20 GOVERNMENT GRANTS

Government grants are initially recognised in the balance sheet as income received in advance once there is reasonable assurance that a grant will be received

and that the TNO Organisation will comply with the conditions attaching to it. Grants to offset costs incurred by the TNO Organisation are recognised systematically as income in the income statement in the same period in which the costs are incurred. See 'Investment grant equalisation account' for the accounting policies on grants for capital expenditure.

### 1.21 SHARE OF THE RESULT OF PARTICIPATING INTERESTS

The share of the result of participating interests relates to the TNO Organisation's share of the results of its participating interests. Results on transactions in which assets and liabilities are transferred between the TNO Organisation and non-consolidated participating interests and between non-consolidated participating interests are not recognised if they are not considered as realised.

The results of participating interests acquired or disposed of during the reporting period are recognised in the result of the TNO Organisation from or up to the date of acquisition or disposal.

### 1.22 TAX

TNO, TNO Bedrijven B.V. and its wholly-owned Dutch subsidiaries are not subject to corporate income tax pursuant to Section 2.7 of the Corporate Income Tax Act. TNO Bedrijven B.V. owns 99% of TNO Deelnemingen B.V., which, along with all its Dutch subsidiaries, is subject to corporate income tax. In addition, subsidiaries registered abroad are subject to profits tax in the country of registration.

Tax is the taxes on profit and deferred taxes payable and recoverable in the reporting period. Tax is recognised in the income statement, except where it relates to items recognised directly through equity, in which case the tax is recognised through equity. The tax due and recoverable for the reporting period is the tax expected to be payable on the taxable profit for the reporting period calculated using tax rates enacted or substantively enacted on the reporting date along with any adjustments to the tax owed in previous years.

For taxable temporary differences between the book value of an asset and liabilities for the purpose of reporting and the fiscal book value of those items a provision for deferred tax liabilities is made.

For deductible temporary differences, available forward loss compensation and unused fiscal settlement options a provision for a deferred tax claim is incorporated but only to the extent that taxable profits are likely to be available in the future for settlement and compensation respectively.

A provision for deferred taxes is formed for temporary differences between the carrying amount of an asset or liability and its tax base. A deferred tax asset is only recognised to the extent that it is probable that taxable profit will be available against which the deductible temporary difference can be utilised.

Deferred tax assets are reviewed at each reporting date and reduced if it is not probable that the related tax benefit will be realised.

### 1.23 CASH FLOW STATEMENT

The cash flow statement is prepared using the indirect method. Cash flows in foreign currencies are translated into euros at the average exchange rate for the period.

### 1.24 FAIR VALUE

Various accounting policies and notes to TNO's financial statements require the fair value of financial and non-financial assets and liabilities to be determined. Fair value is determined as follows for measurement and information purposes.

**Receivables**

The fair value of trade and other receivables is estimated at the present value of the future cash flows.

**Derivatives**

The fair value of currency forward contracts and interest rate swaps is based on listed market prices if available. In the absence of listed market prices, fair value is estimated by discounting expected cash flows to their present value using current interest rates including a risk premium.

**Non-derivative financial liabilities**

The fair value of non-derivative financial liabilities (borrowings) is determined only for information purposes and is calculated from the present value of future repayments and interest payments discounted at the market interest rate at the reporting date.

If applicable, further information on the criteria for determining fair value is presented in the specific note to the asset or liability concerned.

# NOTES TO THE CONSOLIDATED BALANCE SHEET

AT 31 DECEMBER 2013

## 1 INTANGIBLE ASSETS

*(in EUR × thousand)*

Movements in intangible assets in 2013:

| | Goodwill | Software | Total |
|---|---|---|---|
| **Balance at 31-12-2012** | | | |
| Cost | 556 | 9,095 | 9,651 |
| Accumulated amortisation and impairment | –185 | –5,833 | –6,018 |
| **Carrying amount** | **371** | **3,262** | **3,633** |
| **Movement in carrying amount** | | | |
| Additions | 80 | 3,020 | 3,100 |
| Disposals | - | –4 | –4 |
| Amortisation | –193 | –1,728 | –1,921 |
| | **–113** | **1,288** | **1,175** |
| **Balance at 31-12-2013** | | | |
| Cost | 636 | 8,785 | 9,421 |
| Accumulated amortisation and impairment | –378 | –4,235 | –4,613 |
| **Carrying amount** | **258** | **4,550** | **4,808** |

## 2 PROPERTY, PLANT AND EQUIPMENT

Movements in property, plant and equipment in 2013:

| | Land and buildings | Technical plant | Technical equipment | Fixtures and fittings | Total |
|---|---|---|---|---|---|
| **Balance at 31-12-2012** | | | | | |
| Cost | 218,557 | 149,497 | 196,249 | 17,709 | 582,012 |
| Accumulated depreciation and impairment | –131,439 | –94,851 | –150,603 | –12,596 | –389,489 |
| Assets under construction and in development | - | 2,300 | 2,289 | - | 4,589 |
| **Carrying amount** | **87,118** | **56,946** | **47,935** | **5,113** | **197,112** |
| **Movements in carrying amount** | | | | | |
| Additions | 1,097 | 3,304 | 16,288 | 403 | 21,092 |
| Disposals | –92 | –514 | –619 | –8 | –1,233 |
| Reclassification | - | - | - | - | - |
| Impairment | - | - | - | - | - |
| Depreciation | –3,516 | –10,293 | –15,332 | –1,140 | –30,281 |
| Assets under construction and in development | 3,834 | 2,033 | –1,493 | - | 4,374 |
| | **1,323** | **–5,470** | **–1,156** | **–745** | **–6,048** |
| **Balance at 31-12-2013** | | | | | |
| Cost | 219,000 | 151,819 | 194,007 | 16,916 | 581,742 |
| Accumulated depreciation and impairment | –134,393 | –104,676 | –148,024 | –12,548 | –399,641 |
| Assets under construction and in development | 3,834 | 4,333 | 796 | - | 8,963 |
| **Carrying amount** | **88,441** | **51,476** | **46,779** | **4,368** | **191,064** |

The depreciation charge in the income statement includes the release from the investment grant equalisation account.
The carrying amount of the property, plant and equipment at 31 December 2013 includes land and buildings and technical plant of EUR 22.4 million (2012: EUR 25.3 million) of which TNO is only the beneficial owner.

### PROPERTY, PLANT AND EQUIPMENT

| Depreciation rates (%) | 2013 | 2012 |
|---|---|---|
| Land | nihil | nihil |
| Buildings | 2½ | 2½ |
| Technical plant | 6⅔ | 6⅔ |
| Renovations | 6⅔ | 6⅔ |
| Computer equipment | 33⅓ | 33⅓ |
| Technical equipment | 20 | 20 |
| Fixtures and fittings | 10 | 10 |

## 3 FINANCIAL ASSETS

| | Non-consolidated participating interests | | Other loans | Total |
|---|---|---|---|---|
| | Share in equity | Loans | | |
| Balance at 31-12-2012 | 5,135 | 1,823 | 155 | 7,113 |
| Movements: | | | | |
| Additions and loans granted | 270 | 1,066 | - | 1,336 |
| Disposals and repayments | –462 | –1,066 | - | –1,528 |
| Changes in value | 1,594 | –1,823 | - | –229 |
| Result of participating interests | 387 | - | - | 387 |
| Dividend | –272 | - | - | –272 |
| **Balance at 31-12-2013** | **6,652** | **-** | **155** | **6,807** |

Participating interests include the participations of TNO and TNO Bedrijven B.V. The list of participations in which TNO participates both directly and indirectly is included in the notes to the non-consolidated financial statements.

## 4 STOCKS AND WORK IN PROGRESS

| | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|
| Raw materials and resources | 1,308 | | 1,562 |
| Work in progress | 2,016 | | - |
| **Total** | **3,324** | | **1,562** |

| **Work in progress** | **31-12-2013** | | **31-12-2012** |
|---|---|---|---|
| Accumulated costs less provisions for losses and risks | 260,746 | | - |
| Less: accumulated instalments billed | –258,730 | | - |
| **Total work in progress** | **2,016** | | **-** |
| Net work in progress >0 | 82,840 | | - |
| Net work in progress <0 | –80,824 | | - |
| **Total work in progress** | **2,016** | | **-** |

## 5 RECEIVABLES

| | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|
| Receivables relating to assignments | 59,653 | | 62,682 |
| Amounts owed by participating interests | 156 | | 956 |
| Other receivables | 9,322 | | 12,416 |
| Prepayments and accrued income | 7,481 | | 5,923 |
| **Total** | **76,612** | | **81,977** |

Receivables of EUR 1.5 miljoen (2012: EUR 0.8 miljoen) fall due in more than one year.

## 6 CASH AND CASH EQUIVALENTS

At the end of 2013 the cash and cash equivalents exceeded the appropriated reserves, Defence operating risks and Defence new building for (see 9).

## 7 GENERAL RESERVE

| | 2013 | | 2012 |
|---|---|---|---|
| Balance at 1 January | 96,368 | | 117,799 |
| Translation differences reserve | –62 | | 3 |
| Treatment of the loss | –18,474 | | –21,434 |
| **Balance at 31 December** | **77,832** | | **96,368** |

## 8 STATUTORY RESERVE

| | 2013 | | 2012 |
|---|---|---|---|
| Balance at 1 January | 7,772 | | 5,180 |
| Movement | 1,477 | | 2,592 |
| **Balance at 31 December** | **9,249** | | **7,772** |

## 9 APPROPRIATED RESERVES

| | Balance at 31-12-2012 | Withdrawals in 2013 | Additions in 2013 | Balance at 31-12-2013 |
|---|---|---|---|---|
| Civil operating risks | 9,075 | - | - | 9,075 |
| Defence operating risks | 2,500 | - | - | 2,500 |
| Defence buildings | 64,757 | 632 | 3,163 | 67,288 |
| **Total** | **76,332** | **632** | **3,163** | **78,863** |

## 10 INVESTMENT GRANT EQUALISATION ACCOUNT

| | 2013 | 2012 |
|---|---|---|
| Balance at 1 January | 34,759 | 39,374 |
| Net funds granted/repaid in respect of property, plant and equipment | 1,339 | 1,436 |
| | 36,098 | 40,810 |
| Release to the result | –5,089 | –6,051 |
| **Balance at 31 December** | **31,009** | **34,759** |

## 11 PROVISIONS

| | Balance at 31-12-2012 | Withdrawals in 2013 | Additions in 2013 | Release in 2013 | Balance at 31-12-2013 |
|---|---|---|---|---|---|
| Social commitments | 1,562 | 346 | 33 | - | 1,249 |
| Claims | 800 | - | - | - | 800 |
| Restructuring | 3,368 | 7,265 | 13,627 | 361 | 9,369 |
| Redundancy | 2,226 | 1,742 | 947 | 127 | 1,304 |
| Loans to participating interests | 138 | - | 23 | - | 161 |
| Major maintenance | 2,364 | 3,470 | 3,171 | - | 2,065 |
| Other | 5,357 | 1,420 | 3,118 | 1,725 | 5,330 |
| **Total** | **15,815** | **14,243** | **20,919** | **2,213** | **20,278** |

Some EUR 3.3 million of the provisions are of a long-term nature (2012: EUR 6.4 million). The provision for social commitments relates to redundancy costs, supplements to disability (WAO) benefits and future payments for past-service pension entitlements not funded elsewhere.
The claims provision was formed for the estimated liabilities for expected and actual claims which have not yet been settled. A provision is calculated at the estimated future expenditure for each claim including external costs.
The restructuring provisions relate chiefly to agreed severance payments to former employees.
The redundancy provision relates to the expected cost of the proposed termination of employment contracts.
The provision for major maintenance at year-end 2013 was based on maintenance to be performed in accordance with the 2010-2013 maintenance plan.

## 12 LONG-TERM LIABILITIES

| | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|
| Borrowings: | | | |
| Loans from credit institutions | 17,711 | | 19,162 |
| Other borrowings | 265 | | 320 |
| **Total** | **17,976** | | **19,482** |

Of the long-term liabilities EUR 13.2 million mature in more than one year but within 5 years. The remaining long-term liabilities of EUR 4.8 million have a term of more than five years.

Holland Metrology N.V. has a 20-year straight-line mortgage (from ABN AMRO Bank) of EUR 13 m taken out to finance construction/renovation work in Delft. Between 2005 and 2013 Holland Metrology N.V. repaid EUR 6.3 m. The short-term portion of the loan is EUR 0.7 m and is included in current liabilities (bank loans). The interest rate is 4.08-5.2% (swap + mark-up).

Holland Metrology N.V. has a 20-year straight-line mortgage (from ABN AMRO Bank) of EUR 12 m taken out to finance construction of the Euroloop new building development in Europoort. The interest rate is 6.77% (swap + mark-up). Between 2011 and 2013 EUR 1.8 m was repaid. In 2014 a further EUR 0.6 m must be repaid. The loan matures formally on 1 January 2015 (with a residual loan of EUR 9.6 m) by which date at the latest ABN AMRO Bank will indicate the terms and conditions for extending the loan. ABN AMRO has the intention, subject to unforeseen circumstances, to extend the loan with the proviso that a number of conditions (namely ratios and conveniencing forecasts) are met.

The bank has stipulated that Holland Metrology N.V. (and its subsidiary NMi Nederland B.V.) may only pay dividend and pay off the loans (subordinated to the bank) extended by TNO and/or TNO Holdings B.V. if certain conditions are met (incl. a solvency ratio of at least 35% and debt/EBITDA ratios).
The loan extended by TNO is treated as part of the liability capital.
In addition to the solvency requirement, the following security has been agreed:
- First mortgage on the real estate at Thijsseweg 11 in Delft and premises in Dordrecht and in Rotterdam (Vondelingenplaat);
- Pledge on intellectual property rights, office equipment, inventory (excepting VSL B.V.), receivables and stocks;
- Joint and several liability to the bank for NMI Certin B.V., Verispect B.V. and EuroLoop B.V.

At the end of 2008 APP Beheer B.V. drew a mortgage loan of EUR 2,300,000 (from Rabobank) with a term of 20 years to finance land and buildings on the Moerdijk industrial estate in Klundert. The interest rate is 3-month Euribor plus a mark-up of 1.3%. Securities are a mortgage on business premises in Klundert, and a pledge on stocks, inventory and receivables. In 2008-2013 APP had paid off a total of EUR 556,800. The short-term portion of the loan is EUR 115,200 and is shown in current liabilities.

In 2010 APP Beheer B.V. drew a mortgage loan of van EUR 725,000 (from Rabobank) with a term of 20 years to finance buildings on the Moerdijk industrial estate in Klundert. The interest rate is 3-month Euribor plus a mark-up of 1.85%. Securities are a mortgage on business premises in Klundert, and a pledge on stocks, inventory and receivables. In 2010-2013 APP had paid off a total of EUR 206,000. The short-term portion of the loan is EUR 36,000 and is shown in current liabilities.

In 2010 Vitens N.V. extended a level-repayment loan (EUR 461,796) to Ducares B.V. with a term of 10 years for the renovation and furnishing of laboratories. The interest rate 6%. In 2010-2013 Ducares B.V. paid off a total of EUR 152,597. The short-term portion of the loan is EUR 44,176 and is shown in current liabilities.

## 13 CURRENT LIABILITIES

| | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|
| Bank loans | 1,495 | | 1,592 |
| Creditors | 19,958 | | 21,703 |
| Amounts owed to participating interests | 2 | | 17 |
| Tax and social security contributions | 19,323 | | 16,390 |
| Pensions | 3,837 | | 89 |
| Holiday pay | 9,360 | | 9,203 |
| Outstanding holiday days | 17,624 | | 18,939 |
| Other liabilities | 37,410 | | 37,138 |
| Accruals and deferred income | 56,391 | | 45,823 |
| Work in progress | - | | 9,909 |
| **Total** | **165,400** | | **160,803** |

| **Work in progress** | **31-12-2013** | | **31-12-2012** |
|---|---|---|---|
| Accumulated costs less provisions for losses and risks | - | | 508,683 |
| Less: Accumulated instalments billed | - | | –518,592 |
| **Total work in progress** | **-** | | **–9,909** |
| | | | |
| Net work in progress >0 | - | | 122,827 |
| Net work in progress <0 | - | | –132,736 |
| **Total work in progress** | **-** | | **–9,909** |

Accruals and deferred income are chiefly advances received for specific research projects and accrued government funding.

## FINANCIAL INSTRUMENTS

### General

In the course of normal operations, TNO uses a wide range of financial instruments that expose it to market and/or credit risks. These are financial instruments recognised in the balance sheet and currency forward contracts to hedge future transactions and cash flows. TNO does not trade in these financial derivatives and has procedures and codes of conduct to limit the size of the credit risk for every party or market. In the event of a default by a counterparty on amounts owed to TNO, any resultant losses would be limited to the market value of the instruments concerned. The contract value or notional principal sum of the financial instruments is only an indication of the extent to which such financial instruments are used and not the amount of the credit or market risk.

### Interest rate risk

Interest rate risk is limited to any changes in the market value of loans receivable or borrowings, which are preferably made at a fixed interest rate for their entire term. If a loan is not at a fixed interest rate, TNO's policy is to use derivative financial instruments to manage interest rate movements. Loans are held until maturity.

### Credit risk

TNO runs credit risk on transactions in respect of the loss that could arise if a counterparty were to default. This risk is limited by the number and diversity of debtors. The only concentration of credit risk is in respect of the geographical distribution of the outstanding receivables, which are concentrated in the Netherlands.

### Market value

The market value of most of the financial instruments (including loans receivable, receivables, cash, creditors and other payables) recognised in the balance sheet approximates their carrying amount. The market value of other financial instruments recognised in the balance sheet is as follows: The market value of amounts owed by participating interests cannot be determined sufficiently reliably; see note 3. Long-term loans are measured at face value. The fair value of the loans may be different from the face value but this cannot be determined sufficiently reliably.

Of the outstanding USD forward contracts the market value is EUR 2.6 million and the contract value EUR 2.7 million.

To cover the interest risk of the long-term mortgage loan of EUR 16.9 million drawn, Holland Metrology NV has entered into a total of EUR 16.9 million interest rate swaps with terms ranging from 1 December 2018 (EUR 1.8 and 5.0 million) to 1 July 2025 (EUR 10.2 million). The interest rate swap of EUR 1.8 million has a fixed coupon rate of 3.73%, the interest rate swap of EUR 5.0 million has a fixed coupon rate of 4.85% and the interest rate swap of EUR 10.2 million a fixed coupon rate of 4.37%, all at 3-month Euribor. The principal sum of the interest rate swap contracts run synchronous with the agreed repayment schedules of the related loans. The market value of these three contracts at the end of 2013 was minus EUR 2.9 million (2012: minus EUR 3.9 million).

### Assets and liabilities not recognised in the balance sheet

At 31 December 2013 the total 'operational lease' liabilities for 2014 to 2018 were EUR 7.5 million (2012: EUR 8.8 million), of which EUR 3.3 million (2012: EUR 3.6 million) falls due in 2014 and EUR 4.2 million (2012: EUR 5.2 million) falls due between one and five years.

Total rental liabilities came to EUR 95.3 million (2012: EUR 86.0 million), of which EUR 16.3 million (2012: EUR 16.5 million) falls due within one year, EUR 42.5 million (2012: EUR 39.3 million) falls due between 1 and 5 years and EUR 36.5 million (2012: EUR 30.2 million) after five years.

Total bank guarantees issued was EUR 6.5 million (2012: EUR 6.1 million).

At 31 December 2013 total investments in property, plant and equipment came to EUR 2.6 million (2012: EUR 10.0 million).

The total credit and bank guarantee facilities came to EUR 19.5 million (2012: 42.8 million) and EUR 11.0 million (2012: EUR 11.0 million) respectively.

Other security and stipulations for the total credit facilities are:
- Negative pledge/pari passu and cross-default statement;
- Positive/negative mortgage statement on the real estate in Eindhoven;
- Compte Joint and joint and several liability agreement (CJMO) security type: RC plus one party

Total suretyships at the end of 2013 amounted to EUR 1.4 million (2012: EUR 2.8 million).

TNO is involved in a number of disputes and legal proceedings connected to normal operations. TNO does not expect the total liabilities arising from these proceedings to materially affect on the financial position. TNO has also begun proceedings at the Council of State regarding the independent governing bodies (ZBO) cuts imposed by the Ministry of Economic Affairs in 2012. These proceeding are ongoing and the effect thereof cannot yet be ascertained.

Provisions have been formed for all disputes and legal proceedings based on the face value of the expenditure expected to be required to settle the liabilities and losses.

# NOTES TO THE CONSOLIDATED INCOME STATEMENT

## 14 REVENUE

*(in EUR × thousand)*

| | 2013 | | 2012 |
|---|---|---|---|
| Revenue from assignments | 383,646 | | 394,754 |
| Government funding | 180,479 | | 192,266 |
| **Total** | **564,125** | | **587,020** |

Revenue includes the increase movement in work in progress of EUR 11.9 million (2012: EUR 24.4 million).

Revenue by theme/expertise centre:

| | 2013 | | 2012 |
|---|---|---|---|
| Healthy Living | 66,012 | | 71,706 |
| Industrial Innovation | 94,092 | | 91,051 |
| Defence, Safety and Security | 94,386 | | 101,523 |
| Built Environment | 43,333 | | 50,654 |
| Information Society | 41,932 | | 45,826 |
| Energy | 54,655 | | 57,429 |
| Transport and Mobility | 35,221 | | 37,584 |
| Technical Sciences | 10,340 | | 11,171 |
| Behavioural and Societal Sciences | 3,758 | | 4,230 |
| Earth, Environmental and Life Sciences | 8,085 | | 7,930 |
| Other TNO revenue | 6,528 | | 5,062 |
| Revenue of TNO Bedrijven B.V. and its group companies | 115,603 | | 113,124 |
| Intergroup revenue | –9,820 | | –10,270 |
| **Total** | **564,125** | | **587,020** |

## ASSIGNMENTS

| | 2013 | 2012 |
|---|---|---|
| Revenue from assignments by category: | | |
| **Domestic** | | |
| Government | 91,211 | 99,671 |
| Industry | 135,931 | 141,592 |
| **Total domestic** | **227,142** | **241,263** |
| **Foreign** | | |
| International organisations | 44,909 | 43,123 |
| Other | 111,595 | 110,368 |
| **Total foreign** | **156,504** | **153,491** |
| **Total** | **383,646** | **394,754** |

## 15 OTHER OPERATING INCOME

| | 2013 | 2012 |
|---|---|---|
| Result on disposals of property, plant and equipment | –322 | 61 |
| Other income | 15,246 | 18,963 |
| **Total** | **14,924** | **19,024** |

Other income includes income from licences and patents, non-project-related income and expenses recharged externally.

## 16 DIRECT PROJECT COSTS

| | 2013 | | 2012 |
|---|---|---|---|
| Accommodation and energy | 1,654 | | 698 |
| Materials | 14,659 | | 17,645 |
| Use of technical assets | 3,296 | | 4,624 |
| General administrative expenses | 9,939 | | 14,033 |
| Subcontracted work | 43,131 | | 46,511 |
| Other expenses | 1,146 | | 5,567 |
| **Total** | **73,825** | | **89,078** |

## 17 EMPLOYEE EXPENSES

| | 2013 | | 2012 |
|---|---|---|---|
| Wages and salaries | 248,425 | | 243,932 |
| Pension expenses | 33,484 | | 33,239 |
| Other social security expenses | 33,357 | | 33,081 |
| Other employee expenses | 63,119 | | 72,819 |
| Movement in liability for outstanding holiday days | –1,445 | | –1,743 |
| Use of provisions: | | | |
| – social commitments | –346 | | –360 |
| – redundancy | –1,869 | | –1,406 |
| – restructuring | –7,626 | | –4,710 |
| – pensions | –39 | | - |
| | **367,060** | | **374,852** |
| Additions to provisions: | | | |
| – social commitments | 33 | | 59 |
| – restructuring | 13,627 | | 2,478 |
| – redundancy | 947 | | 1,792 |
| – pensions | - | | 2 |
| **Total** | **381,667** | | **379,183** |

The average effective number of employees in 2013 was 3,895 of whom 63.3 were outside the Netherlands (2012: 3,892 and 58).
The remuneration of the TNO Board of Management including pension contributions was EUR 0.8 million (2012: EUR 1.0 million).
The amount reserved for the crisis levy was EUR 0.1 million.
The remuneration of the TNO Supervisory Board members was EUR 0.1 million (2012: EUR 0.1 million).

The funding ratio (market value of the investments expressed as a percentage of the provision for pension obligations according to the DNB prinicples) of the TNO Stichting Pensioenfonds at 31 December 2013 was provisionally 110%, thereby more than sufficiently meeting the short-term recovery plan so that there is no need to announce any pension cuts. Because the funding ratio was 110%, in the coming year there is no need, according to the agreed graduated calculation of interest, for an additional deposit of 2% and the premium can be reduced to 17%.

The long-term recovery plan remains in effect, with a capital requirement, based on the current investment mix at 31 December 2013, of 115.2%.

## 18 DEPRECIATION

| | 2013 | | 2012 |
|---|---|---|---|
| Depreciation of: | | | |
| – buildings | 3,516 | | 3,800 |
| – technical plant | 10,293 | | 11,394 |
| – technical equipment | 15,332 | | 17,027 |
| – fixtures and fittings | 1,140 | | 1,381 |
| | 30,281 | | 33,602 |
| Release from: | | | |
| – investment grant equalisation account | –5,089 | | |
| | | | –6,051 |
| **Total** | **25,192** | | **27,551** |

## 19 OTHER OPERATING EXPENSES

| | 2013 | | 2012 |
|---|---|---|---|
| Accommodation | 47,623 | | 47,272 |
| Materials | 4,254 | | 5,323 |
| Use of technical assets | 13,737 | | 14,659 |
| General administrative expenses | 29,763 | | 31,671 |
| Subcontracted work | 10,397 | | 10,099 |
| Movements in provisions | 35 | | –1,746 |
| Other expenses | 4,043 | | 3,471 |
| Contributions | 896 | | 1,086 |
| **Total** | **110,748** | | **111,835** |

## 20 RESULT OF PARTICIPATING INTERESTS

This is the result of non-consolidated participating interests and the result on sales of participating interests.

### Related parties

Transactions with related parties occur if there is a relationship with the entity, its participating interests and their directors and senior executives.

In the course of its normal operations, TNO provides and receives services from various related parties in which TNO has an interest of 50% or less. These transactions are generally conducted on arm's length terms comparable with those for transactions with third parties.

# BALANCE SHEET OF THE TNO ORGANISATION

AT 31 DECEMBER 2013

*after treatment of the loss* *(in EUR × thousand)*

| | | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|---|
| **Non-current assets** | | | | |
| Property, plant and equipment | 1 | 145,762 | 154,841 | |
| Financial assets | 2 | 46,203 | 44,189 | |
| | | 191,965 | | 199,030 |
| **Current assets** | | | | |
| Inventories | 3 | 5,323 | 297 | |
| Receivables | 4 | 58,844 | 64,146 | |
| Cash and cash equivalents | | 97,102 | 98,410 | |
| | | 161,269 | | 162,853 |
| **Total** | | **353,234** | | **361,883** |
| **Equity** | | | | |
| – General reserve | | 77,832 | 96,368 | |
| – Statutory reserve | | 9,249 | 7,772 | |
| – Appropriated reserves | | 78,863 | 76,332 | |
| | | 165,944 | | 180,472 |
| **Investment grant equalisation account** | | 31,009 | | 34,759 |
| **Provisions** | 5 | 18,781 | | 14,161 |
| **Current liabilities** | 6 | 137,500 | | 132,491 |
| **Total** | | **353,234** | | **361,883** |

# INCOME STATEMENT OF THE TNO ORGANISATION

*(in EUR × thousand)*

| | | 2013 | | 2012 |
|---|---|---|---|---|
| Revenue from domestic and foreign assignments | | 202,713 | | 211,397 |
| Revenue from government assignments | | 73,351 | | 78,351 |
| Market revenue | | | 276,064 | | 289,748 |
| Government funding | | | 180,479 | | 192,266 |
| Revenue | 7 | | 456,543 | | 482,014 |
| Other operating income | | | 22,021 | | 23,642 |
| **Operating income** | | | **478,564** | | **505,656** |
| Direct project costs | | –69,064 | | –82,212 | |
| Employee expenses | 8 | –318,034 | | –316,684 | |
| Depreciation | | –19,260 | | –19,924 | |
| Other operating expenses | | –91,373 | | –90,449 | |
| Operating expenses | | | –497,731 | | –509,269 |
| **Operating loss** | | | **–19,167** | | **–3,613** |
| Interest income | | | 1,699 | | 2,636 |
| Interest expense | | | –17 | | –46 |
| **Result on ordinary activities before tax** | | | **–17,485** | | **–1,023** |
| Tax | | | - | | - |
| Result of participating interests | | | 3,019 | | –8,538 |
| **Net result** | | | **–14,466** | | **–9,561** |

# CASH FLOW STATEMENT OF THE TNO ORGANISATION

*(in EUR × thousand)*

| CASH FLOW STATEMENT OF THE TNO ORGANISATION | | 2013 | | 2012 |
|---|---|---|---|---|
| Net result | –14,466 | | –9,561 | |
| Non-controlling interests' share in the result | - | | - | |
| Group result | –14,466 | | –9,561 | |
| Depreciation and amortisation | 19,260 | | 19,924 | |
| Results of participating interests included in the result | –2,880 | | 8,535 | |
| Gains and losses on disposals of property, plant and equipment | 322 | | –61 | |
| Movement in provisions | 4,620 | | –1,152 | |
| Movement in working capital excluding cash and cash equivalents | 5,285 | | –25,435 | |
| Dividends received | - | | - | |
| Cash flow from operating activities | | **12,141** | | **–7,750** |
| Investment in intangible assets | - | | - | |
| Investment in property, plant and equipment | –16,369 | | –15,285 | |
| Investment in financial assets | –4,925 | | –2,568 | |
| Disposals of intangible assets | - | | - | |
| Disposals of property, plant and equipment | 777 | | 2,218 | |
| Sale of participating interests and repayments received | 5,791 | | 3,349 | |
| Cash flow from investing activities | | **–14,726** | | **–12,286** |
| Investment grants received/repaid | 1,339 | | 1,436 | |
| Borrowings | - | | - | |
| Repayment of borrowings | - | | –26 | |
| Cash flow from financing activities | | **1,339** | | **1,410** |
| **Cash flow for the financial year** | | **–1,246** | | **–18,626** |
| Cash and cash equivalents at 1 January | | 98,410 | | 117,033 |
| Cash flow for the financial year | | –1,246 | | –18,626 |
| Exchange gains and losses | | –62 | | 3 |
| **Cash and cash equivalents at 31 December** | | **97,102** | | **98,410** |

# ACCOUNTING POLICIES

**General**

See the notes to the consolidated financial statements for the accounting policies and items not presented separately below.

# NOTES TO THE BALANCE SHEET

AT 31 DECEMBER 2013

## 1 PROPERTY, PLANT AND EQUIPMENT

*(in EUR × thousand)*

Movements in property, plant and equipment in 2013

| | Land and buildings | Technical plant | Technical equipment | Fixtures and fittings | Total |
|---|---|---|---|---|---|
| **Balance at 31-12-2012** | | | | | |
| Cost | 189,804 | 148,910 | 106,027 | 15,596 | 460,337 |
| Accumulated depreciation and impairment | –122,409 | –94,646 | –81,388 | –11,642 | –310,085 |
| Assets under construction and in development | - | 2,300 | 2,289 | - | 4,589 |
| **Carrying amount** | **67,395** | **56,564** | **26,928** | **3,954** | **154,841** |
| **Movement in carrying amount** | | | | | |
| Additions | 374 | 3,304 | 8,878 | 273 | 12,829 |
| Disposals | –93 | –514 | –492 | - | –1,099 |
| Depreciation | –2,619 | –10,053 | –10,729 | –948 | –24,349 |
| Assets under construction and in development | 3,000 | 2,033 | –1,493 | | 3,540 |
| | **662** | **–5,230** | **–3,836** | **–675** | **–9,079** |
| **Balance at 31-12-2013** | | | | | |
| Cost | 190,085 | 151,232 | 92,020 | 14,482 | 447,819 |
| Accumulated depreciation and impairment | –125,028 | –104,231 | –69,724 | –11,203 | –310,186 |
| Assets under construction and in development | 3,000 | 4,333 | 796 | | 8,129 |
| **Carrying amount** | **68,057** | **51,334** | **23,092** | **3,279** | **145,762** |

The depreciation charge in the income statement includes the release from the investment grant equalisation account.
The carrying amount of the property, plant and equipment at 31 December 2013 includes land and buildings and technical plant of EUR 22.4 million (2012: EUR 25.3 million) of which TNO is only the beneficial owner.

## 2 FINANCIAL ASSETS

| | Group companies Share of equity | Participating interests Share of equity | Loans | Total |
|---|---|---|---|---|
| **Balance at 31-12-2012** | 31,021 | 323 | 12,845 | 44,189 |
| Movements: | | | | |
| Additions and loans granted | 3,400 | - | 1,525 | 4,925 |
| Disposals and repayments | - | - | –5,791 | –5,791 |
| Result of participating interests | 2,942 | - | - | 2,942 |
| Translation differences reserve | –62 | - | - | –62 |
| **Balance at 31-12-2013** | **37,301** | **323** | **8,579** | **46,203** |

Group companies include the wholly-owned participating interest in TNO Bedrijven B.V.
Loans of EUR 7.0 million mature in more than one year.

## 3 STOCKS AND WORK IN PROGRESS

| | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|
| Raw materials and resources | 381 | | 297 |
| Work in progress | 4,942 | | - |
| **Total** | **5,323** | | **297** |

| | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|
| **Work in progress** | | | |
| Accumulated costs less provisions for losses and risks | 199,768 | | - |
| Less: acculmulated instalments billed | –194,826 | | - |
| **Total work in progress** | **4,942** | | **-** |
| Net work in progress >0 | 77,981 | | - |
| Net work in progress <0 | –73,039 | | - |
| **Total work in progress** | **4,942** | | **-** |

## 4 RECEIVABLES

| | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|
| Receivables relating to assignments | 43,943 | | 47,830 |
| Amounts owed by group companies | 5,106 | | 3,609 |
| Amounts owed by participating interests | 157 | | 956 |
| Other receivables | 2,157 | | 5,831 |
| Prepayments and accrued income | 7,481 | | 5,920 |
| **Total** | **58,844** | | **64,146** |

Receivables of EUR 1.5 million fall due in more than one year.

## 5 PROVISIONS

| | Balance at 31-12-2012 | Withdrawals in 2013 | Additions in 2013 | Release in 2013 | Balance at 31-12-2013 |
|---|---|---|---|---|---|
| Social commitments | 1,561 | 346 | 33 | - | 1,248 |
| Claims | 800 | - | - | - | 800 |
| Restructuring | 3,143 | 6,106 | 11,848 | 361 | 8,524 |
| Redundancy | 2,226 | 1,742 | 947 | 127 | 1,304 |
| Major maintenance | 2,364 | 3,470 | 3,171 | - | 2,065 |
| Other | 4,067 | 1,222 | 3,118 | 1,123 | 4,840 |
| **Total** | **14,161** | **12,886** | **19,117** | **1,611** | **18,781** |

Some EUR 2.7 million of the provisions are of a long-term nature (2012: EUR 5.2 million). The provision for social commitments relates to redundancy costs, supplements to disability (WAO) benefits and future payments for past-service pension entitlements not funded elsewhere.

The claims provision was formed for the estimated liabilities for expected and actual claims which have not yet been settled. A provision is calculated at the estimated future expenditure for each claim including external costs.

The restructuring provisions relate chiefly to agreed severance payments to former employees. The redundancy provision relates to the expected cost of the proposed termination of employment contracts.

The provision for major maintenance at year-end of 2013 is based on maintenance to be performed in 2014 in accordance with the long-term maintenance plan.

## 6 CURRENT LIABILITIES

| | 31-12-2013 | | 31-12-2012 |
|---|---|---|---|
| Creditors | 14,167 | | 16,649 |
| Amounts owed to group companies | 795 | | 496 |
| Amounts owed to participating interests | 2 | | 17 |
| Tax and social security contributions | 16,499 | | 13,099 |
| Holiday pay | 7,679 | | 7,749 |
| Outstanding holiday days | 15,035 | | 16,488 |
| Other liabilities | 26,544 | | 24,797 |
| Accruals and deferred income | 56,779 | | 45,823 |
| Work in progress | - | | 7,373 |
| **Total** | **137,500** | | **132,491** |

The accrued liabilities concern for a significant part advances received in the context of specific research projects as well as accrued government funding.

| **Work in progress** | **31-12-2013** | | **31-12-2012** |
|---|---|---|---|
| Accumulated costs less provisions for losses and risks | - | | 435,977 |
| Less: Accumulated instalments billed | - | | –443,350 |
| **Total work in progress** | - | | **–7,373** |
| | | | |
| Net work in progress >0 | - | | 115,698 |
| Net work in progress <0 | - | | –123,071 |
| **Total work in progress** | - | | **–7,373** |

# NOTES TO THE INCOME STATEMENT FOR 2013

## 7 REVENUE

*(in EUR × thousand)*

| | | 2013 | | 2012 |
|---|---|---|---|---|
| Assignments for industry | | 103,453 | | 109,339 |
| Assignments for international organisations | 40,217 | | 39,499 | |
| Other foreign assignments | 59,043 | | 62,559 | |
| | | 99,260 | | 102,058 |
| Government assignments | | 73,351 | | 78,351 |
| Market revenue | | 276,064 | | 289,748 |
| Revenue from government funding | | 180,479 | | 192,266 |
| **Total** | | **456,543** | | **482,014** |

## 8 EMPLOYEE EXPENSES

| | 2013 | 2012 |
|---|---|---|
| Wages and salaries | 201,751 | 197,997 |
| Pension expenses | 27,657 | 27,566 |
| Other social security expenses | 27,163 | 27,135 |
| Other employee expenses | 58,759 | 65,660 |
| Movement in liability for outstanding holiday days | –1,442 | –1,741 |
| Movements in provisions | 4,146 | 67 |
| **Total** | **318,034** | **316,684** |

The fees below were charged to the TNO Organisation, its subsidiaries and other consolidated companies by KPMG Accountants N.V. pursuant to Section 2:382a of the Netherlands Civil Code.

## 9 AUDITOR'S FEES

*(in EUR × thousand)*

| | 2013 | | 2012 |
|---|---|---|---|
| Audit of the financial statements | 429 | | 458 |
| Other audit engagements | 561 | | 550 |
| Consultancy services | 32 | | 424 |
| **Total** | **1,022** | | **1,432** |

## WNT: LAW ON THE NORMALISATION OF SALARIES FOR TOP OFFICIALS IN THE PUBLIC AND SEMI-PUBLIC SECTOR

| Position | Name of chairperson-applicable clause | Name | Commencement date of service | End date of service | Remuneration (fixed) | Remuneration (one-off) | Taxable fixed and variable expense allowances fiscal surcharge car –/– own contribution | Provisions for remuneration payable later, employer contribution to pension premium | Total | Within WNT Norm | Reason for exceeding the norm |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Member of Supervisory Board (Chair) | Y | Dr C.A. Linse | 1-3-2011 | | 24,996 | 0 | 2,004 | 0 | 27,000 | N | Transition scheme [1)] |
| Member of Supervisory Board | N | Prof. J.M. Bensing PhD | 1-9-2008 | | 15,140 | 0 | 2,004 | 0 | 17,144 | N | Transition scheme [1)] |
| Member of Supervisory Board | N | I.G.C. Faber MBA | 1-10-2009 | | 18,000 | 0 | 2,004 | 0 | 20,004 | N | Transition scheme [1)] |
| Member of Supervisory Board | N | I.H.J. Vanden Berghe MSc | 1-2-2011 | | 18,000 | 0 | 2,004 | 0 | 20,004 | N | Transition scheme [1)] |
| Member of Supervisory Board | N | C. van Dijkhuizen MSc | 1-11-2009 | | 18,000 | 0 | 2,004 | 0 | 20,004 | N | Transition scheme [1)] |
| Member of Supervisory Board | N | Prof. P.P.C.C. Verbeek PhD | 1-5-2012 | | 18,000 | 0 | 2,004 | 0 | 20,004 | N | Transition scheme [1)] |
| Member of Supervisory Board | N | H.W. Broeders | 1-7-2006 | | 18,000 | 0 | 2,004 | 0 | 20,004 | N | Transition scheme [1)] |
| Member of Board of Management (Chair) | Y | J.H.J. Mengelers MSc | 1-7-2003 | | 236,053 | 0 | 22,968 | 23,827 | 282,848 | N | Transition scheme [1)] |
| Member of Board of Management | N | Dr C.M. Hooymans * | 1-10-2002 | From 1-10-2013 no longer top official | 199,927 | 0 | 11,942 | 18,938 | 230,807 | N | Transition scheme [1)] |
| Member of Board of Management | N | J.W. Kelder | 1-1-2009 | | 186,533 | 0 | 4,080 | 19,504 | 210,117 | Y | |
| Managing director of Theme | N | Dr M.J. van Bracht | 1-8-1981 | | 149,268 | 15,815 | 9,572 | 16,248 | 190,903 | Y | |
| Managing director of Theme | N | D.Ph. Schmidt MSc | 1-5-1977 | | 170,174 | 18,297 | 11,450 | 19,840 | 219,761 | Y | |
| Managing director of Theme | N | L.J.J. Kusters MSc | 1-1-1994 | | 126,050 | 2,821 | 2,170 | 14,958 | 145,999 | Y | |
| Managing director of Theme | N | Dr N.J. Snoeij | 1-4-1992 | | 184,056 | 6,103 | 7,574 | 18,443 | 216,176 | Y | |
| Managing director of Theme | N | Prof. E.R. Fledderus PhD | 1-1-2003 | | 121,379 | 0 | 2,400 | 13,860 | 137,639 | Y | |
| Managing director of Theme | N | H.G. Geveke MSc | 1-9-2010 | | 173,872 | 5,423 | 12,656 | 17,603 | 209,554 | Y | |
| Managing director of Theme | N | A.J.A. Stokking | 1-9-2010 | | 183,386 | 18,470 | 12,549 | 18,374 | 232,779 | N | Transition scheme [1)] |
| Managing director of Expertise area | N | Prof. P.J. Werkhoven PhD | 14-3-1994 | | 169,299 | 16,818 | 13,697 | 17,224 | 217,038 | Y | |
| Managing director of Expertise area | N | Dr A. Sanderman | 1-1-2003 | | 146,209 | 4,731 | 10,488 | 15,986 | 177,414 | Y | |
| Managing director of Expertise area | N | Dr D.C. Zijderveld MPA * | 1-4-2008 | 1-8-2013 | 97,552 | 5,110 | 5,855 | 9,448 | 117,965 | Y | |
| Director of Business & Information | N | C. Eberwijn MSc | 16-7-1981 | | 166,311 | 5,920 | 7,271 | 17,877 | 197,379 | Y | |
| Director of Finance & Facilities | N | C.H.M. van Gerven MSc * | 15-6-2006 | 1-10-2013 | 120,447 | 5,341 | 6,438 | 12,399 | 144,625 | Y | |
| Director of Finance & Facilities (interim) | N | F. Marring LLM | 14-10-2013 | 31-1-2014 | 55,800 | 0 | 0 | 0 | 55,800 | N.a., less than 6 months | |
| Director of Strategy | N | Prof. E. Hagdorn-van der Meijden PhD | 1-7-2009 | | 155,658 | 4,033 | 2,048 | 16,076 | 177,815 | Y | |
| Director of Human Resources | N | I.C. van den Broek LLM | 15-9-2009 | | 175,744 | 5,822 | 12,214 | 17,742 | 211,522 | Y | |
| Director of Marketing & Communications | N | E. van Zeggeren MBA | 1-1-2012 | | 166,035 | 11,221 | 12,420 | 16,939 | 206,615 | Y | |

* The allowances for these officials concern the allowance for the period in which they performed their tasks. All stated officials are employed 100%.

1) WNT transition scheme
The WNT transition scheme adjusts in art. 7.3 the remuneration of the officials that exceeds the law's norm and whereby employment began before the law took effect. These officials retain their agreed remuneration for a maximum of four years, after which the remuneration must be reduced according to the stipulations of the law to the maximum that applies to the respective legal person or institution within a period of three years. If an appointment or remuneration agreement is amended within the transition period of four years, the right to the transition scheme become null and void.

## STATEMENT CONCERNING ALL THOSE WHOSE REMUNERATION EXCEEDS THE PREVAILING REMUNERATION NORM

| Position | Commencement date of service | End date of service | Scale | Remuneration | Taxable fixed and variable expense allowances | Payment due to termination of service | Reeson for exceeding the norm |
|---|---|---|---|---|---|---|---|
| Senior business consultant | 26-10-1984 | 1-6-2013 | 100% | 88,049 | 0 | 332,211 | a |
| Quality management advisor | 01-10-1979 | 1-1-2013 | 100% | 0 | 0 | 343,425 | a |
| Staff and Support assistant | 16-05-1979 | 20-12-2013 | 100% | 91,096 | 0 | 251,208 | a |
| Senior Scientist Specialist | 01-10-1986 | 20-12-2013 | 100% | 96,714 | 0 | 299,262 | a |
| Senior Scientist Specialist | 01-02-1987 | 20-12-2013 | 100% | 118,116 | 0 | 265,245 | a |
| Senior Consultant | 01-09-1980 | 20-12-2013 | 100% | 122,956 | 0 | 346,800 | a |
| Director International (external) | 01-02-2013 | 30-11-2013 | 100% | 301,600 | 2,908 | - | - |
| Consultant (external) | 01-01-2013 | 01-10-2013 | 28% | 59,885 | - | - | - |

a Exceeding the WNT norm fully attributable to redundancy payment as a result of termination of contract.

**WNT note**

TNO has used the WNT policy regulations as its normative framework in the drafting of these Financial statements. The WNT Amendment Act, which is part of this normative framework, has not yet been passed by the Dutch Parliament, which may lead to modifications to the information provided from the WNT Amendment Act.

# PARTICIPATING INTERESTS

**AT THE END OF 2013 TNO HAD DIRECT OR INDIRECT PARTICIPATION IN THE FOLLOWING COMPANIES:**

| Name | Registered office | % |
|---|---|---|
| TNO Bedrijven B.V. | Delft | 100 |
| TNO Deelnemingen B.V. | Delft | 99 |
| TNO Technostarters B.V. | Delft | 100 |
| TNO Management Consultants B.V. | Apeldoorn | 100 |
| – Investors in People Nederland B.V. | Eindhoven | 100 |
| – CBO BV | Apeldoorn | 100 |
| Dutchear B.V. | Delft | 100 |
| TNO Automotive International B.V. | Delft | 100 |
| – TNO Automotive Safety Solutions B.V. | Delft | 100 |
| – TNO Madymo B.V. | Delft | 100 |
| – TNO Madymo North America Inc. | Delaware, US | 100 |
| – TNO Automotive Japan K.K. | Yokohama, Japan | 100 |
| – TASS Germany GmbH | Stuttgart, Germany | 100 |
| – TNO Automotive Shanghai Co. Ltd. | Shanghai, China | 100 |
| – TNO Automotive Korea Ltd. | Seoul, Korea | 100 |
| – European Electric Mobility Center B.V. | Helmond | 100 |
| – DITCM Facilities B.V. (v/h AFB Driving Guidance Lab) | Helmond | 100 |
| – TASS International Safety Center B.V. (voorheen TTAI) * | Helmond | 100 |
| – TNO Homologations B.V. | Helmond | 100 |
| Den Haag Centrum voor Strategische Studies B.V. | The Hague | 80 |
| Holland Metrology N.V. | Delft | 100 |
| – Verispect B.V. | Delft | 100 |
| – Nmi Certin B.V. | Delft | 100 |
| – Nmi Italia S.R.L. | Padua, Italy | 85 |
| – VSL B.V. | Delft | 100 |
| – Euroloop B.V. | Rotterdam | 100 |
| TNO Diana B.V. | Delft | 70 |
| – Femsys Ltd. | Leicester, GB | 100 |
| – TNO Diana UK Ltd. | Leicester, GB | 100 |
| – TNO Diana NA Inc. | Delaware, US | 100 |
| TNO Heimolen B.V. | Bergen op Zoom | 100 |
| DUCARES B.V. | Zeist | 100 |
| SU Biomedicine B.V. | Zeist | 70 |
| Delft Patents B.V. | Delft | 80 |
| APP Beheer B.V. | Bergen op Zoom | 100 |
| – Aerospace Propulsion Products B.V. | Hoogerheide | 100 |
| – APP Onroerend Goed B.V. | Klundert | 100 |
| TNO Triskelion B.V. | Zeist | 100 |

| | | |
|---|---|---|
| CelSian Glass & Solar B.V. | Eindhoven | 100 |
| ProQares B.V. | Rijswijk | 100 |
| – ProQares USA Inc. | Washington, US | 100 |
| TNO International Agencies B.V. | Delft | 100 |

* Consolidation from 2013

**THE FOLLOWING COMPANIES ARE NOT CONSOLIDATED:**

| Name | Registered office | % |
|---|---|---|
| Mestcorp Inc. | Lake Oswego, US | 6 |
| Beyond Genomics Medicine Inc. | Waltham, US | 0 |
| Transport & Mobility Leuven N.V. | Leuven, Belgium | 50 |
| Prime Vision B.V. | Delft | 40 |
| GnTel B.V. | Groningen | 34 |
| WTCW N.V. | Amsterdam | 6 |
| Kestrel Displays Ltd. | Portsmouth, GB | 20 |
| Noord Tech Ventures C.V. | Groningen | 3 |
| Delbia B.V. | Beverwijk | 24 |
| Dyadic International Inc. | Jupiter, US | 0 |
| NMI UK Ltd. | Bangor, GB | 51 |
| Sino-Euro Biomedicine Co. Ltd | Chengdu Sichuan, China | 50 |
| GluGreen B.V. | Helmond | 20 |
| Delft Sense B.V. | Delft | 50 |
| Consumer Voice B.V. | Groningen | 90 |
| Dariuz B.V. | Eindhoven | 30 |
| Efectis Holding SAS | St. Aubin, France | 50 |
| – Efectis France SAS | St. Aubin, France | 100 |
| – Efectis Nederland B.V. | Delft | 100 |
| – Efectis Investment NL B.V. | Rijswijk | 100 |
| – Efectis Real Estate Company (EREC) B.V. | Rijswijk | 100 |
| – Efectis Ibérica S.L. | Madrid, Spain | 27 |
| – Efectis Eurasia A.S. | Istanbul, Turkey | 100 |
| – Efectis Era Avrasya A.S. | Istanbul, Turkey | 66 |
| SoLayTec B.V. | Eindhoven | 27 |
| BATAVIA Bioservices B.V. | Leiden | 25 |
| – BATAVIA Holdings Inc. | Delaware, US | 100 |
| – BATAVIA Bioservices Inc. | Delaware, US | 100 |
| Prime Data B.V. | Delft | 100 |
| Triple E Consulting - Energy, Environment & Economics B.V. | Rotterdam | 25 |
| YES!Delft B.V. | Delft | 20 |

| | | |
|---|---|---|
| Soliqz B.V. | Delft | 100 |
| LDI Systems B.V. | Delft | 100 |
| Endures B.V. | Den Helder | 100 |
| Automotive Facilities Brainport Holding N.V. | Helmond | 24 |

**Disposals/closed in 2013**

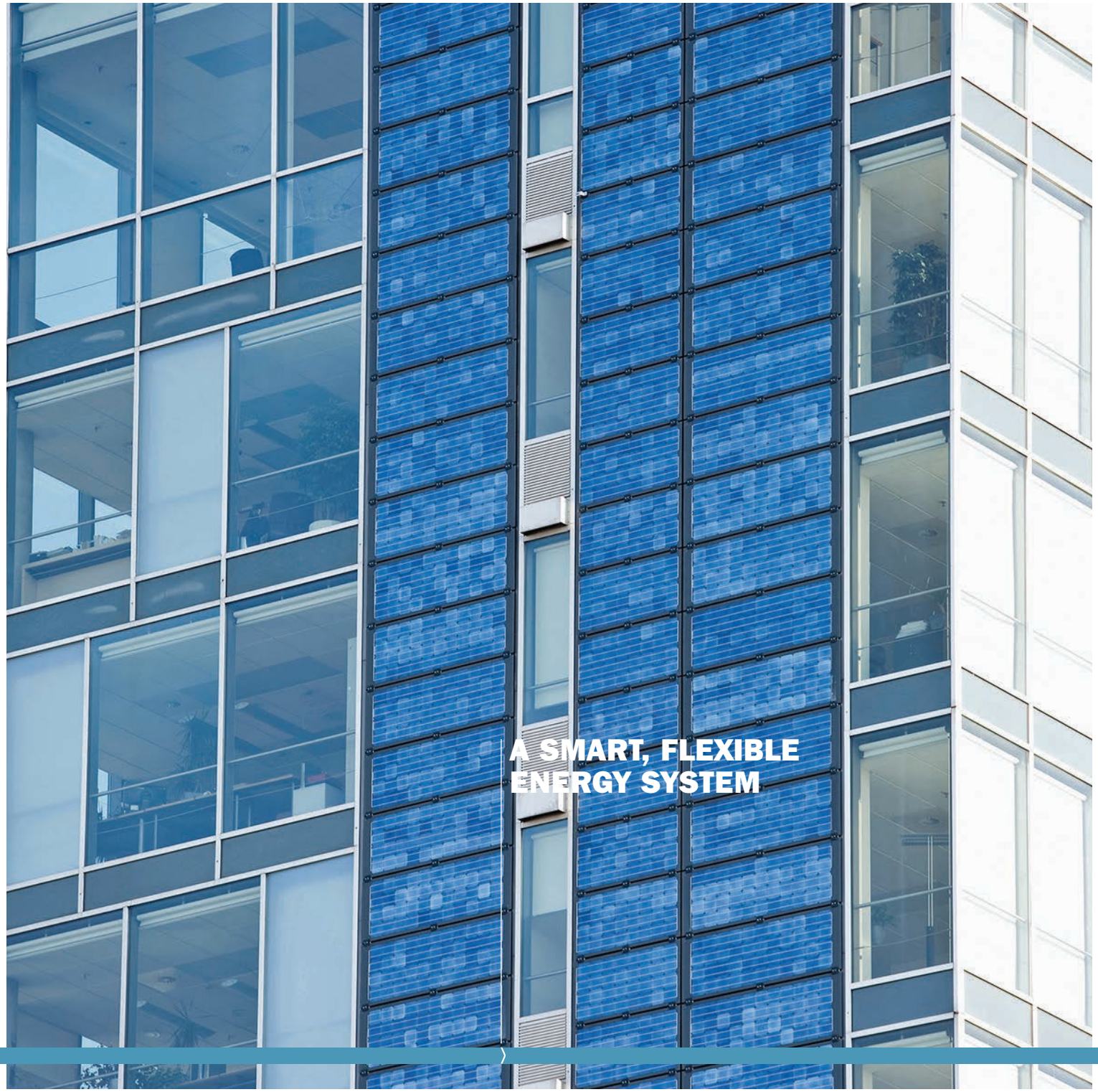
| | | |
|---|---|---|
| TNO UK Holding Ltd. | London, GB | 100 |
| Delft Carshalton Ltd. (vh TNO Bibra) | Carshalton, GB | 100 |
| NMI Nederland B.V. | Delft | 100 |
| Keuren en Kalibreren B.V | Hengelo | 100 |
| Cropwatch Holding B.V. | Oosterbeek | 33 |
| Cropwatch B.V | Ooseterbeek | 90 |
| White Dolphins B.V. | Doorn | 50 |
| TNO Real Estate Holding B.V. | Delft | 100 |

# OTHER INFORMATION

## STATEMENT OF THE TNO BOARD OF MANAGEMENT

The consolidated and company balance sheet as at 31 December 2013 and the consolidated and company profit and loss account for the year then ended have been derived from the financial statements of TNO for the year 2013.

Our auditors issued an unqualified opinion on these financial statements in their auditor's report, dated March 19, 2014. This auditor's report, as a part of the Dutch Annual Audit, Can be obtained from TNO.



# A SMART, FLEXIBLE ENERGY SYSTEM

If energy-intensive SMEs were to flexibly adjust their consumption to the supply of renewable energy, they could generate significant savings. Savings are already possible by modifying the business process. It is a win-win situation: the company saves energy and costs while the amount of renewable energy increases. TNO is working with a number of energy companies and SMEs in the Flexiquest project to investigate how we have to change our energy system to make that flexibility both feasible and profitable. That will turn the current system on its head: it won't be demand that determines supply but the supply of cheaper renewable energy that generates demand. TNO has developed an open technology standard for electricity grids where the partners in Flexiquest will be engaging in large-scale pilots. The idea is that companies will soon align their demand for renewable electricity to the supply of solar and wind energy on a large scale. This energy will be supplied not only by the major energy companies but also by local suppliers like collectives that resupply the grid.

TNO innovation for life

# MEMBERSHIP OF THE BOARDS

## TNO SUPERVISORY BOARD

**Dr C.A. Linse, chairman**
SINCE 1 MARCH 2011
Chairman of the Supervisory Board of Mn Services N.V.
Member of the Supervisory Board of AKZO Nobel Nederland B.V.
Director of MRC Global Inc., Houston
member of the Board of Technologiestichting STW
Chairman of the Railways Pension Fund Foundation

**I.H.J. Vanden Berghe**
SINCE 1 FEBRUARY 2011
Administrator general of the National Geographic Institute (Belgium).
Various executive positions including:
- President of Eurogreographics
- First Belgian delegate to EuroSDR-OEEPE
- Founding member and member of the Management Board of EuroSDR
- Chairman of the council of Administrators eneral of semi-government organisation
- Chairman of the inter-semi-governmental internship committee
- Visiting professor at KU Leuven
- Member of the Board of VITO (Flemish Institute for Technological Research)

**Prof. J.M. Bensing PhD**
SINCE 1 SEPTEMBER 2008
Honorary Research Fellow of the Netherlands Institute for Health Services Research (NIVEL). Professor of Health Psychology at Utrecht University.
Various executive and supervisory positions including:
- Member of the Royal Netherlands Academy of Arts and Sciences (KNAW)
- Member of the Health Council of the Netherlands
- Vice-chairman of the Supervisory Board of Jeroen Bosch hospital
- Member of the Supervisory Board of the Consumer Association
- Member of the Supervisory Board of Flevoziekenhuis hospital
- Member of the Supervisory Board for de Hoogstraat Convalescence Centre

**I.G.C. Faber MBA**
SINCE 1 OCTOBER 2009
Chief Executive Officer of Faber Halbertsma Group Various executive and supervisory positions including:
- Member of the Supervisory Board of Jaarbeurs N.V. (Utrecht Exhibition Centre)
- Member of the Supervisory Board of Rova Zwolle (waste processing)
- Member of the board of the National Register of Supervisory Directors and Regulators
- Member of the Supervisory Board of Probos

**H.W. Broeders**
SINCE 1 JULY 2006
Various executive and supervisory positions including:
- Non-executive director of Forrester Research
- Chairman of the Supervisory Board of Jaarbeurs N.V. (Utrecht Exhibition Centre
- Chairman of Stichting ZZP-Erkend
- Chairman of the Netherlands International Chamber of Commerce

**C. van Dijkhuizen MA**
SINCE 1 NOVEMBER 2009
Member of the Board of ABN AMBank N.V.
Various executive and supervisory positions including:
- Member of the Board of Trustees of Museum Meermanno
- Chairman of the Government Committee on Export, Import and Investment Guarantees
- Chairman of the Supervision Committee of the Dutch Banking Association
- Member of the Board of the Duisenberg School of Finance
- Member of the Capital Markets Committee of the Financial Markets Authority

**Prof. P.P.C.C. Verbeek PhD**
SINCE 1 MAY 2012
Professor of philosophy of technology at the University of Twente.
Chairman of the Philosophy Department at the University of Twente.
Various board positions, including:
– President of the Society for Philosophy and Technology
– Member of the Dutch Council for the Humanities
– Member of the 'Young Academy', part of the Royal Netherlands Academy of Arts and Sciences (chairman between 2011 and 2013)
– Member of the editoriall board of Tijdschrift voor Filosofie, SATS, Journal for Northern Philosophy, Philosophy & Technology

**E.I.V. van den Hengel, secretary**
SINCE 1 AUGUST 2012

## TNO BOARD OF MANAGEMENT

**J.H.J. Mengelers MSc, chairman**
FROM 01 APRIL 2008 TO 01 MARCH 2014
Various executive and supervisory positions, including:
– Chairman of Executive Board EARTO
– Chairman of Supervisory Board RAI Holding
– Member of Executive Board of Joanneum Research Forschungsgesellschaft mbH
– Member of Innovation Council (Ministry of Infrastructure and the Environment)
– Member of Board of SIA (Stichting Innovatie Alliantie)
– Member of Board of SKO (Stichting Kennisontwikkeling HBO)
– Member of Board of STT (Stichting Toekomstbeeld der Techniek)
– Member of Board of Stichting Brainport

**W. Nagtegaal**
SINCE 01 FEBRUARY 2014
Chairman of TNO Council for Defence Research Various executive and supervisory positions, including:
– Member of Nederland Maritiem Land
– Chairman of the Maritime Knowledge Centre (MKC) board
– Member of the Netherlands Industry for Defence and Security (NIDV) board
– Supervisory director of The Hague Centre for Strategic Studies

**Dr C.M. Hooymans**
FROM 1 OCTOBER 2002 TO 1 OCTOBER 2013
Various executive and supervisory positions, including:
– Member of Supervisory Board of Koninklijke KPN N.V.
– Member of Supervisory Board of Rabobank Vallei-en-Rijn
– Member of the Board of the Radboud Foundation (Radboud University and Radboud University medical Centre)
– Member of the Board of Koning Willem I Foundation, for selection of bienniel entrepreneurial award
– Member of the Central Commission for Statistics

**Prof. J.T.F. Keurentjes PhD**
SINCE 01 FEBRUARY 2014
Various executive and supervisory positions, including:
– (co)Director of TKI Bio-Based Economy
– Chairman of the VNCI innovation working group
– Member of NWO-NCI programme board
– Member of Supervisory Board ISPT
– Member of VNO-NCW Committee for Technology & Innovation
– Member of Chemical Engineering Processing editorial board (Elsevier)
– DGA Van Keke Beheer B.V.

**J.W. Kelder**
SINCE 01 JANUARY 2009
Acting chairman of TNO Board of Management since 01-03-2014
Various executive and supervisory positions, including:
– Member of the Board of the Indonesian Remembrance Centre Bronbeek
– Member of the Supervisory Board of the Netherlamnds Historical Shipping Museum
– Member of the Board of the Netherlands Industry for Defence and Security (NIDV), until 01-02-2014
– Member of the Board of the Dutch Maritime Network Foundation (NML), until 01-02-2014
– Member of the Life-saving Council of Clipper Stad Amsterdam
– Member of the Supervisory Board of The Hague Centre for Strategic Studies (HCSS), until 01-02-2014
– Chairman of the Board of the Maritime Knowledge Centre (MKC), until 01-02-2014

**F. Marring LLM**
SINCE 01 FEBRUARY 2014
Various executive and supervisory positions, including:
– Supervisory director and chair of audit committee of Oasen N.V., the waterworks for the Green Heart
– Supervisory director and chair of audit committee of NOVEC B.V., supplier of erection points for mobile telecommunication
– Director and chair of Stichting LTP, owner of LTP, psychological advisory bureau

**Strategic Advisory Councils**

Each theme has a strategic advisory council that is called together a number of times throughout the year to offer advice and reflection for the theme directors.

**THEME TRANSPORT AND MOBILITY**

Ms K. (Karla) Peijs MSc, chair
H.C.A. (Harold) Goddijn MSc, Tom Tom
Mr R. Paul, Havenbedrijf Rotterdam NV
Mr A. (Ad) Rutten, Schiphol Nederland BV
Prof. B. (Bart) van Arem PhD, TU Delft
Mr S. (Siebe) Riedstra, Ministry of Infrastructure and the Environment
G. (Guido) van Woerkom LLM, ANWB
H. (Harrie) Schippers MSc, DAF Trucks NV
R. (Ruud) Koornstra, Tendris
Ms Th. Menssen, Havenbedrijf Rotterdam NV
A.B. (Alexander) Sakkers MSc, Transport en Logistiek Nederland
Mr R.H. (Roelf) de Boer, RAI Association

**THEME INDUSTRIAL INNOVATION**

R. (Rein) Willems MSc, voorzitter VNCI
Prof. C.J. van Duijn PhD, TU-E, Rector Magnificus
Mr L. (Ludo) Deferm Ph.D., IMEC Leuven
M.H. (Marc) Hendrikse MSc, CEO NTS-Group
H. (Harry) Borggreve MSc, ASML
H. (Henk) van Muijen MSc, MTI Holland BV
Dr H. (Henk) van Houten, Philips Research
Dr B.J. Lommerts, Latexfalt B.V., Managing Director
M. Lubben, DSM Innovation Centre
Dr B. Leeftink, Ministry of Economic Affairs
R.M. Bergkamp LLM, Ministry of Economic Affairs

**THEME ENERGY**

Mr J.G.M. (Hans) Alders, chair EnergieNed
Mr G. (GertJan) Lankhorst, Gasterra, CEO
P. (Paul) van Riel MSc, FUGRO, board member
Mr R. (Rein) Bemer, Raad voor NITG, chair
Mr P. (Peter) Molengraaf, Alliander, CEO
Mr T.H.J.J. (Tim) van der Hagen, TU-Delft, Dean faculty of Applied Physics
E.J. (Bert) de Vries LLM, Ministry of Economic Affairs, director of Energy and Sustainability
Prof. G.J. (Bert) van der Zwaan PhD, University of Utrecht, rector magnificus
A.F. (Ab) van der Touw MSc, Siemens Nederland, CEO
Mr J.F. (Jeroen) de Haas, Eneco, CEO
J.D. (Dirk Jan) Bokhoven MSc, EBN, CEO
G.J.M. (Gerald) Schotman MSc, Royal Dutch Shell Plc.
Ms Tanja Klip-Martin, Provincie Drenthe, delegate
Mr Bart van der Leemput, NAM, Managing Director
Mr B.J. Krouwel
C.B.F. (Chris) Kuijpers MSc, Ministry of Infrastructure and the Environment, director-general Environment and International
Dr B. (Bernard) ter Haar, Ministry of Social Affairs and Employment, director-general Participation and Income Security

**THEME BUILT ENVIRONMENT**

Ms S.M. (Sybilla) Dekker, chair
Ms M. (Marjolein) Demmers MSc, DHV, programme director Sustainability
J.H. (Jan Hendrik) Dronkers LLM, Ministry of Infrastructure and the Environment, Director General Rijkswaterstaat
M.M. (Mark) Frequin MSc, Ministry of Internal Affairs and Kingdom Relations, DG Housing, Neighbourhoods and Integration
Prof. R. (Ronald) van Kempen PhD, University of Utrecht, dean of the faculty of Geosciences
B. (Bert) Keijts MSc, Stichting Portaal, Executive Board chair
Ms Prof. K. (Karin) Laglas, TU-D, Dean of the faculty of Architecture
N.J. (Nico) de Vries MSc, Kon. BAM groep NV, executive board
Ms A. Rakhorst, Search BV, director
Vacancy, local government / municipality
Vacancy, Building sector / Architecture

**CENTRE FOR HEALTH ASSETS**

L.C. Bruggeman MSc, Un. Medical Centre Groningen, executive board chair
Dr J. Coolen, Cordaan
Contact not yet known, NPCF
Prof. G.P.M.R. Dewulf PhD, University of Twente
Ms M. Dragstra
W. Geerlings MSc, Medical Centre Haaglanden, RvB
Prof. H. de Jonge, Brink Groep, board chair
P. de Kroon, Vanboeijen
J.R. Luursema BSc, AAG
W.A. van der Meeren MSc, CZ, executive board chair
Ms J. Mengerink, Carint-Reggeland Groep, executive board
J.A. Mieris MSc, Strukton
Prof. T. Venhoeven, Ton Verhoeven c.s. architects
J.K. van Wijngaarden MSc, Chief Inspector Public Health

**THEME DEFENCE, SAFETY AND SECURITY**

*Members are (re)appointed by the TNO Council for Defence research*

A.C.J. (Lex) Besselink MSc, chair, former Director Weapon systems & Industry DMO
E. (Erik) Oliemans
H.J.J. (Henri) Lenferink MSc, Ministry of Internal Affairs and Kingdom Relations, Mayor of Leiden, portfolio holder for Security Council Innovation
Mr H. (Henk) van Zwam, Head of National Operations for the National Police Force
Mr G. (Gerard) van Klaveren,Fire Services, Regional fire services commander for Limburg South, portfolio holder for Innovation regional command council
M.A. (Rien) Geurtsen MSc
C. (Cent) van Vliet MSc, St. NIDV
Prof. B.(Ben) J.M. Ale PhD
F. (Fred) J. Abbink MSc, former director NLR
K.W. Bogers MSc, Siemens Nederland N.V.
M.G.M. Koning ter Heege MSc, CTO Thales Nederlands
Prof. H. Rudolph PhD, NDA, dean of faculty of Military Sciences

**THEME INFORMATION SOCIETY**

Mr A.H. (Amandus) Lundqvist, chair SURF Foundation and High Tech Systems Platform, chair
Mr E.H.M. (Erik) Hoving , KPN
Mr B.P.F. (Bart) Jacobs, University of Nijmegen, Faculty of Science
Prof. W. Jonker PhD, EIT ICT labs, CEO
G.J. Buitendijk, Ministry of Internal Affairs and Kingdom Relations, DG

**THEME HEALTHY LIVING**

Prof. E.C. (Eduard) Klasen PhD, chair Leiden University Medical Centre
Dr R.W. (Rob) van Leen, MBA DSM, Innovation Centre
Prof. E.M.M. (Emmo) Meijer PhD, Unilever/Friesland Foods
Ms Prof. M. (Marian) de Visser, AMC Professor of Neurology, board member of NWO
Mr C. (Cees) Oudshoorn, VNO-NCW

# GRI GUIDELINES FOR SUSTAINABILITY REPORTS

We used the G3.1 Guidelines for Sustainability Reports issued by the Global Reporting Initiative (GRI) when preparing this report. The Guidelines have been applied at level B+ (see the GRI statement). We have selected at least twenty economic, social and environmental indicators in addition to the mandatory information (categories 1.1 to 4.17 and the policy statements).

Global Reporting Initiative™

## Verklaring
## GRI toepassingsniveau check

GRI verklaart hierbij dat het "TNO Jaarverslag 2013" van **TNO** aan GRI's Report Services is gepresenteerd, en dat er geconcludeerd is dat het rapport aan de eisen van toepassingsniveau B+ voldoet.

De GRI toepassingsniveaus communiceren in welke mate de inhoud van de G3.1 richtlijnen gebruikt zijn in de ingediende duurzaamheidsverslaglegging. De Check bevestigt dat de vereiste combinatie en aantal rapportageonderdelen voor het specifieke toepassingsniveau worden behandeld in de verslaglegging en dat de GRI inhoudsopgave een juiste weergave is van deze vereiste rapportageonderdelen, zoals deze gedefinieerd zijn in de GRI G3.1 richtlijnen. Voor methodologie, zie www.globalreporting.org/SiteCollectionDocuments/ALC-Methodology.pdf

De toepassingsniveaus geven geen mening over de duurzaamheidsprestaties van de desbetreffende organisatie en geven geen mening over de kwaliteit van de verslaglegging.

Amsterdam, 10 maart 2014

B+ GRI REPORT GRI CHECKED

Nelmara Arbex
Adjunct President-Directeur
Global Reporting Initiative

Het "+" symbool is toegevoegd aan dit toepassingsniveau, aangezien TNO (gedeeltes) van de verslaglegging extern heeft laten verifiëren. GRI aanvaardt het eigen oordeel van de desbetreffende organisatie in het kiezen van de uitvoerende organisatie en het beslissen van de reikwijdte van de verificatie.

*Het Global Reporting Initiative (GRI) is een netwerkorganisatie die het voortouw heeft genomen in de ontwikkeling van 's wereld's meest gebruikte raamwerk voor duurzaamheidsverslaglegging en is voortdurend toegewijd aan verbetering en toepassing van dit raamwerk op wereldwijde schaal. De GRI richtlijnen beschrijven principes en indicatoren die organisaties kunnen gebruiken om hun prestaties op het gebied van economie, milieu en maatschappij te meten en te rapporteren.*
*www.globalreporting.org*
***Disclaimer:** In het geval dat de betreffende verslaglegging externe links geeft, zoals naar audiovisueel materiaal, is het van belang te begrijpen dat dit Statement alleen van toepassing is op het ingediende materiaal aan GRI ten tijde van de Check op 20 februari 2014. GRI geeft expliciet te kennen dat dit Statement niet kan worden gebruikt als er op een later tijdstip veranderingen zijn doorgevoerd aan.*

The GRI index chart shows the GRI indicators that can be found in the Annual Report and where.

| Description of GRI component | Section | Page | Comments |
|---|---|---|---|
| **STRATEGY AND ANALYSIS** | | | |
| 1.1 Statement of the CEO | Report Board of Management | 4-6 | |
| 1.2 Consequences, risks and possibilities | Report Board of Management 2013 | 4-6 | |
| **Organisation profile** | | | |
| 2.1 Name of organisation | | This chart | The company name TNO stands for Netherlands Organisation for Applied Scientific Research. |
| 2.2 Brands, products and/or services | Innovate with impact: role of TNO in innovation | 21 | |
| 2.3 Operational structure of the organisation | Corporate governance 2013; Report Board of Management | 13, 14, 16 | |
| 2.4 Location of headquarters | | This chart | The registered office of TNO is Delft. |
| 2.5 Countries of operation | | This chart | TNO has its registered office in the Netherlands and participates in several companies in countries stated in the list of participating interests. The complete list is available at TNO.NL/LOCATIONS |
| 2.6 Ownership and legal form | Corporate Governance 2013 | 13, 14 | |
| 2.7 Sales markets | Organisation and environment; Mission and statutory tasks, developing innovation landscape; Notes to the consolidated income statement | 16, 68, 69 | The distribution of activities across the different stakeholders is disclosed in the financial statements. |
| 2.8 Size of company | Operations: Personnel | 26 | |
| 2.9 Organisational changes during the reporting period | Corporate governance 2013: Organisation and environment: Organisation structure | 13, 14, 17 | |
| 2.10 Distinctions during the reporting period | Report by the Board of Management 2013 | 5, 6 | |

| Description of GRI component | Section | Page | Comments |
|---|---|---|---|
| **Report parameters** | | | |
| 3.1 Reporting period | Responsible and dynamic: Adjustment and reporting | 32 and this chart | The reporting period runs from 1-1-2013 to 31-12-2013. |
| 3.2 Previous review | | This chart | The annual report of 2012 appeared in March 2013. The CSR component is described in 'People and Society', part of the annual report for 2012. |
| 3.3 Reporting cycle | | This chart | This report is published annually. |
| 3.4 Contact(s) | Colophon | 107 | |
| 3.5 Process for defining the content of the report | Responsible and dynamic: a new version for CSR@TNO; Adjustment and reporting | 30, 31 | The content of the annual report is based on the material topics. |
| 3.6 Boundary of the report | Responsible and dynamic: Adjustment and reporting | 32 | This annual review concerns TNO, whereby a distinction is made between the TNO Organisation and the participations. |
| 3.7 Limitations on the scope or boundary of the report | Responsible and dynamic: Adjustment and reporting | 30, 32 | |
| 3.8 Basis for reporting on alliances | Notes to the consolidated financial statements | 54 | |
| 3.9 Calculation principles | Responsible and dynamic: Reduce environmental impact; Notes to the consolidated financial statements | 35-36, 51-53 and this chart | Notes to the consolidated annual accounts;<br>The environmental footprint of TNO;<br>The principles for the annual accounts are extensively explained from p. 52;<br>The calculation principle for the environmental footprint is explained on p. 35 and in the background document 'Explaining the environmental footprint of TNO 2011', which can be found at TNO.NL/CSR. |
| 3.10 Restatements | | This chart | There has been no reformulation. |
| 3.11 Changes in the reporting | | This chart | No significant changes occurred during the reporting period that are relevant to this reporting. |
| 3.12 Standard disclosures | | This chart | |
| 3.13 External assurance | Assurance report | 43-44 | |

| Description of GRI component | Section | Page | Comments |
|---|---|---|---|
| **Governance, commitment and engagement** | | | |
| 4.1 Governance structure | Corporate governance 2013 | 13-14 | |
| 4.2 Chairman of the highest governing body | Membership of Boards | 91 | |
| 4.3 Highest independent governing body | Report of Supervisory Board; Corporate governance 2013 | 8, 13, 14 | |
| 4.4 Mechanisms for shareholders and employees for recommendations to highest governing body | Report by the Board of Management 2013; Organisation and environment; Developing new strategy 2015-2018; Responsible and dynamic: A new version for CSR@TNO | 5, 17, 30 | |
| 4.5 Link between the compensation to highest governing body and performance of the organisation | Notes to the consolidated income statement 2013 | 81-83 | |
| 4.6 Processes whereby the highest governing body ensures conflicts of interest are avoided | Corporate governance 2013 | 13, 14 | |
| 4.7 Process for determining the qualifications of the members of the Board of Management to supervise the strategy in terms of socio-economic and environmental topics | Corporate governance 2013; Responsible and dynamic: Diversity | 13, 14, 38, 39 | |
| 4.8 Internally developed mission statements and codes of conduct important for CSR performance | Responsible and dynamic: A new version for CSR@TNO | 30 | |
| 4.9 Procedures of the Board of Management for assessing, adjusting and managing sustainability performance | Responsible and dynamic: Adjustment and reporting | 30, 32 | |
| 4.10 Processes for evaluating Board of Management's own performance | Corporate governance 2013; Responsible and dynamic: Adjustment and reporting | 13, 14 30, 32 | |

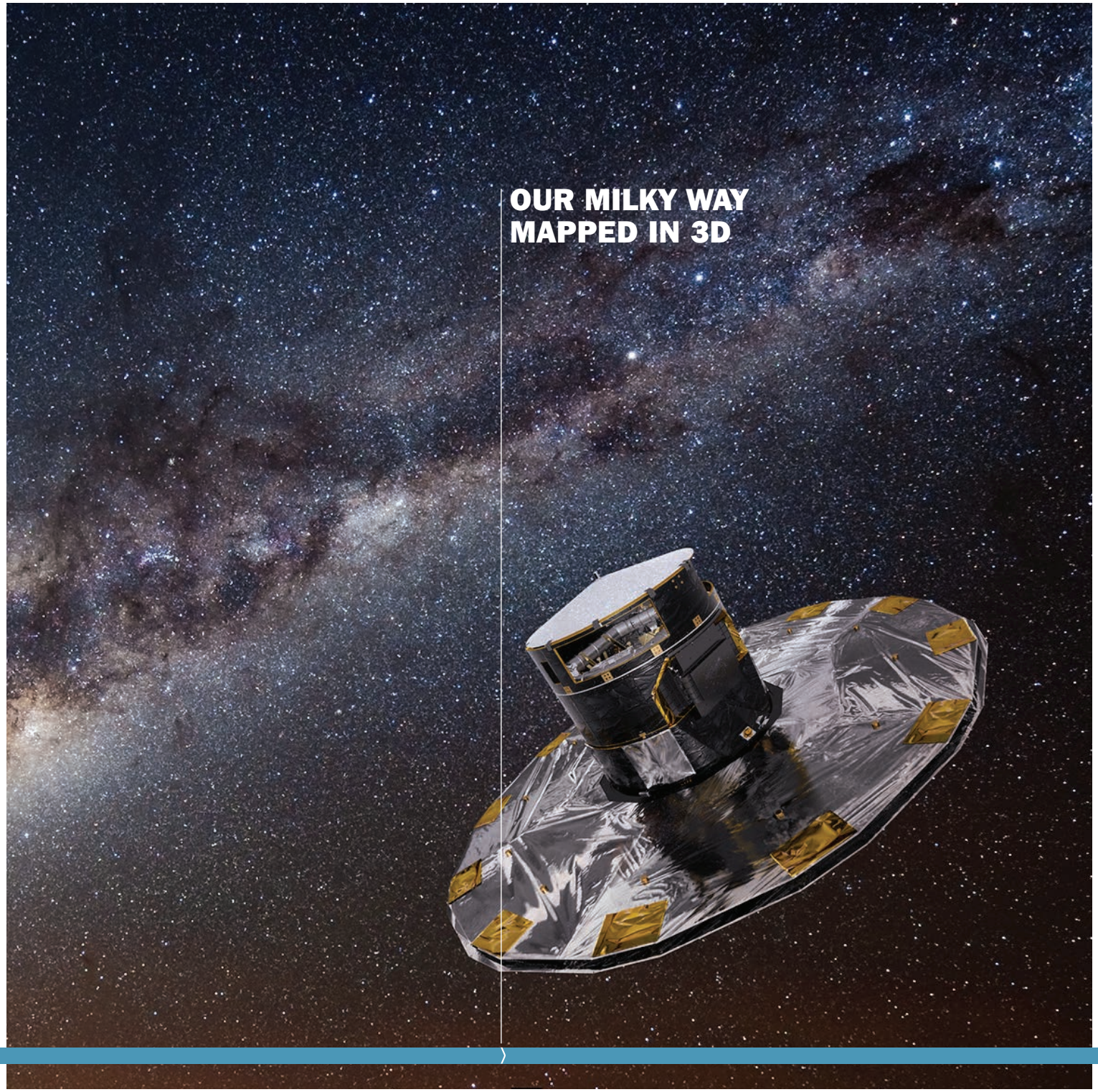
| Description of GRI component | Section | Page | Comments |
|---|---|---|---|
| 4.11 Explanation of application of the precaution principle | Responsible and dynamic: Integrity | 34, 35 | |
| 4.12 Externally developed initiatives to which the organisation subscribes | Responsible and dynamic | 32, 34, 37 | – Transparency benchmark<br>– Society: 'Jet-Net', 'Girls Day'<br>– Organisation: Lean & Green statement of intent |
| 4.13 Membership of associations and interest groups | | This chart | TNO participates in countless organisations. Strategically international cooperation in the context of EARTO (trade association of Europe's specialised research and technology organisations) and nationally with the TO2 federation. Since 2011 Jan Mengelers (chairman of the Board of Management) has been chair of EARTO. |
| 4.14 List of relevant groups of stakeholders engaged by the organisation | Board of Management Report 2013; Organisation and environment; Responsible and dynamic: A new version for CSR@TNO | 4-6, 16-19, 30 | |
| 4.15 Basis for selection of shareholders | Board of Management Report 2013; Organisation and environment | 4-6, 17 | |
| 4.16 Approach to stakeholder engagement | Board of Management Report 2013; Organisation and environment | 4-6, 17 | During the development of the strategic plan 2015-2018 extensive consultation took place with external stakeholders. |
| 4.17 Reaction of the organisation to the topics discussed through stakeholder engagement | Responsible and dynamic: a new version for CSR@TNO | 30, 31 | |

| Description of GRI component | Section | Page | Comments |
|---|---|---|---|
| **Policy statements** | | | |
| DMA EC: Economic performance | Board of Management Report 2013; Finance; Key figures | 5, 42, 48 | |
| DMA EC Indirect economic impact | Board of Management Report 2013 | 4-6 | TNO aims for 'Impact' (title of the strategic plan 2011-2014 is: 'Innovate with impact') and strives to reach this in partnership with other parties and through a focus on seven societal themes. |
| DMA EN Policy statement: Environment (Aspects: Materials, Energy, Emissions and waste, Products and services, Transport, Overall) | Responsible and dynamic: Adjustment and reporting; Reduce environmental impact | 30, 31, 35, 36 | This is described in the CSR Policy Statement. The relevant aspects are all considered in this annual report in the 'Responsible and dynamic' section. |
| DMA LA Policy statement: Employees (Aspects: Employability, employer-employee relations, health and safety, training and diversity) | Operations; Personnel; Responsible and dynamic: The employee, Diversity | 26-28, 37-39 | |
| DMA HR Policy statement: Human rights (aspects: investment and purchasing policy, non-discrimination) | Responsible and dynamic: Integrity | 34, 35 and this chart | This is described in the CSR Policy Statement. TNO adheres to Dutch law and legislation and there is no need for supplementary policy for this organisation in this area. |
| DMA SO Policy statement: Society<br>– Aspect of Corruption<br>– Aspect of Public policy<br>– Aspect of Anti-competitive behaviour | Report by TNO Board of Management; Corporate Governance 2013; Responsible and dynamic: Integrity | 4-6, 13, 14, 34, 35 | This is described in the CSR Policy Statement. The Supervisory Board ensures correct execution of the TNO Act, as contained in the Corporate Governance 2013 whereby independence and avoidance of unfair competition are central. Integrity plays a key role as contained in the code of conduct discussed and agreed with all new employees. |
| DMA PR Policy statement: Product Responsibility (aspects: Product and service labelling and Compliance) | Organisation and environment: Impact in public debate, Knowledge audit | 17-18 | TNO's mission is to create innovations and generally complete projects with the delivery of a report. The quality is improved by the outcome of customer satisfaction surveys. In the GRI table the outcomes are considered, see PR 5. |

| Description of GRI component | Section | Page | Comments |
|---|---|---|---|
| **Economic indicators** | | | |
| EC 1 Direct economic value | Consolidated balance sheet en consolidated financial statements including notes | 49, 50, 52-73 | |
| EC 4 Financial support from the government | TNO profile; Key figures | 41, 48 | |
| EC 8 Services and investments geared to societal importance | Responsible and dynamic | 30-39 | The investments in Development cooperation are a clear signal of TNO's societal investments. |
| EC 9 Description of indirect economic impact | Responsible and dynamic: Society, Societal impact, Social return | 32-34 | Innovation for Life is key within TNO and specifically within the Strategic Plan 2011-2014. |
| **Environmental indicators** | | | |
| EN 2 Materials used from external sources | Responsible and dynamic: Reduce environmental impact | 35-37 | |
| EN 3 Direct primary energy consumption | Responsible and dynamic: Reduce environmental impact | 35, 36 | |
| EN 4 Indirect energy consumption | Responsible and dynamic: Reduce environmental impact | 35, 36 | |
| EN 5 Energy saving | Responsible and dynamic: Reduce environmental impact | 35-37 | |
| EN 6 Initiatives to offer energy-efficient products or services and the corresponding fall in energy consumption | Organisation and environment: Impact in public debate; Responsible and dynamic: Reduce environmental impact | 17, 35-37 | Sustainability and scarcity are the central thread through the themes; consequences for energy consumption have not yet been calculated. To extend and professionalise CSR policy within TNO a project began in September 2013 to demonstrate its impact on sustainability (people-planet-profit). |
| EN 7 Initiatives to indirectly reduce energy consumption | Responsible and dynamic: Reduce environmental impact | 35-37 | |
| EN 17 Other indirect emission of greenhouse gases | Responsible and dynamic: Reduce environmental impact | 36-37 | |

| Description of GRI component | Section | Page | Comments |
|---|---|---|---|
| EN 18 Initiatives to reduce indirect greenhouse gases | Responsible and dynamic: Reduce environmental impact | 36-37 | |
| EN 26 Initiatives to reduce environmental harm | Responsible and dynamic: A new vision for CSR@TNO; Reduce environmental impact | 35-37 | |
| EN 29 Environmental impact of the transport of goods and employees | Responsible and dynamic: Reduce environmental impact | 36-37 | |
| EN 30 Investments in and spending on environmental protection | Responsible and dynamic | 35-36 | |
| **Social indicators** | | | |
| LA 1 Profile of personnel base | Operations: Personnel; Responsible and dynamic: Diversity | 26, 39 | |
| LA 3 Employee benefit snot valid for part-time or temporary contracts | Operations: Personnel; Terms and conditions of employment | 28 | |
| LA 4 Percentage of employees that are part of the collective labour agreement | Operations: Personnel; Terms and conditions of employment | 28 and this chart | The TNO terms and conditions of employment apply to all employees contracted by TNO, whereby each employee has an individual labour contract. |
| LA 6 Percentage of personnel base represented in health and safety committees | Responsible and dynamic: The employee; Operations: Personnel | 37, 38, 28 and this chart | A substantial portion of employees is involved in occupational health and safety, with 320 company first-aid assistants, 6 bio-prevention assistants, 4 bio-safety officers, 20 radiation experts and about 300 room supervisors. |
| LA 7 Work disability | Responsible and dynamic: The employee, Vitality; Operations: Personnel | 37, 38 | |
| LA 10 Average number of hours for education and training | Responsible and dynamic: Personnel, Education and development | 27 | Distribution per (type) of employee is not effected centrally. |
| LA 11 Programmes for competence management and lifelong learning | Responsible and dynamic: Personnel, Education and development | 27 | |
| LA 13 Diversity of personnel | Responsible and dynamic: Diversity | 38, 39 | TNO focuses on gender diversity |

| Description of GRI component | Section | Page | Comments |
|---|---|---|---|
| LA 14 Relationship between basic salaries of men and women | | This chart | The TNO terms and conditions of employment apply to all employees contracted by TNO, whereby each employee has an individual labour contract and, of course, no gender distinction is made in this respect. |
| HR 2 Verification of key suppliers complying with human rights | | This chart | TNO adheres to Dutch law and legislation such that there is no need for supplementary policy in this field. |
| HR 3 Training in the area of human rights | Responsible and dynamic: Society | 34, 35 and this chart | The Development Cooperation team is trained in acting ethically in developing countries. |
| HR 4 Discrimination | | This chart | No instances of discrimination within TNO were reported in 2013. |
| SO 3 Training in anti-corruption policy | Responsible and dynamic: Integrity | 34, 35 | Integrity is one of TNO's core values within the code of conduct. This aspect is part of the introduction course that all (207 = 6% employees) new TNO employees followed in 2013. |
| SO 4 Measures following corruption | | This chart | Within TNO in 2013 there were no known cases of corruption. |
| SO 6 Contributions to political parties | | This chart | TNO makes no financial contribution to political parties. |
| SO 7 Penalties for anti-competitive activities | | This chart | In 2013 no sanctions were taken related to anti-competitive or associated activities. |
| SO 8 Monetary value of significant penalties | | This chart | In 2013 there were no penalties or other measures imposed as a consequence of non-compliance with law and legislation. |
| PR 5 Customer satisfaction | Organisation and environment: Customer satisfaction | 17, 18 | |
| PR 9 Monetary value of significant penalties | | This chart | TNO was not subject to any penalties in 2013. |



# OUR MILKY WAY MAPPED IN 3D

Can you measure the thickness of a hair at a distance of a thousand kilometres? Until recently no, but TNO has made such an inconceivable feat possible through the instruments it conceived and developed for the ESA satellite GAIA. This unprecedented level of precision is essential to GAIA's five-year mission to measure more than a billion stars in our galaxy. GAIA will gather more than a million gigabytes worth of data that will give scientists all over the world insight into the creation of our galaxy and the role of dark matter in the universe.
To this end the optical telescopes, which are super stable thanks to TNO's ingenious instruments, will be making very high-resolution 3D images, resulting ultimately in an enormous map of the stars. We will then know exactly where the stars are, at what distance they lie and in what direction and at what speed they are moving, what their chemical composition is and much more. GAIA is expected to come up with a whole host of important discoveries. Astronomers are licking their lips at the prospect.

TNO innovation for life

# COLOPHON

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