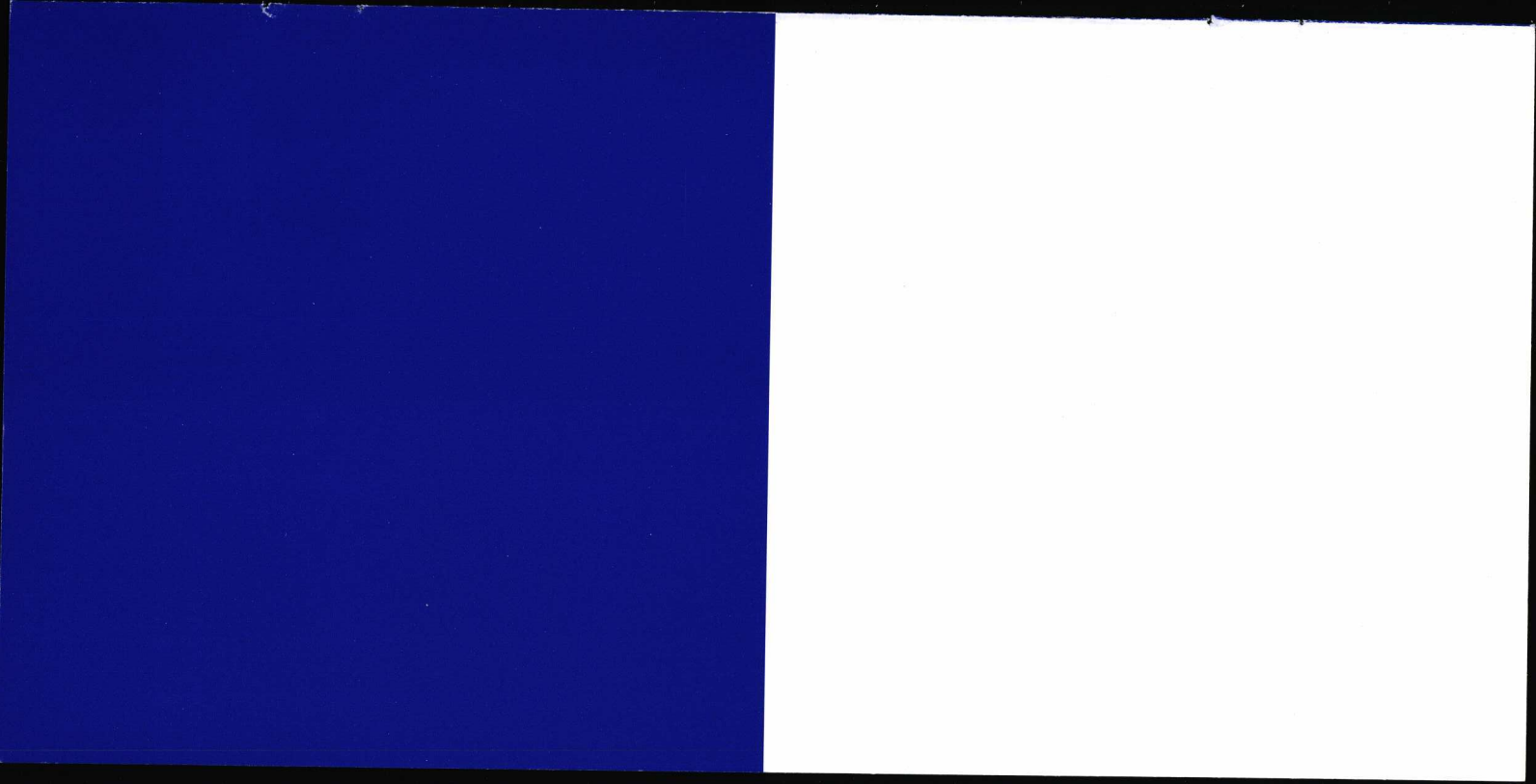


Agenda for TNO 2003 – 2006



Agenda for TNO

2003 – 2006



Summary of TNO strategy in figures

(amounts x millions of euros)

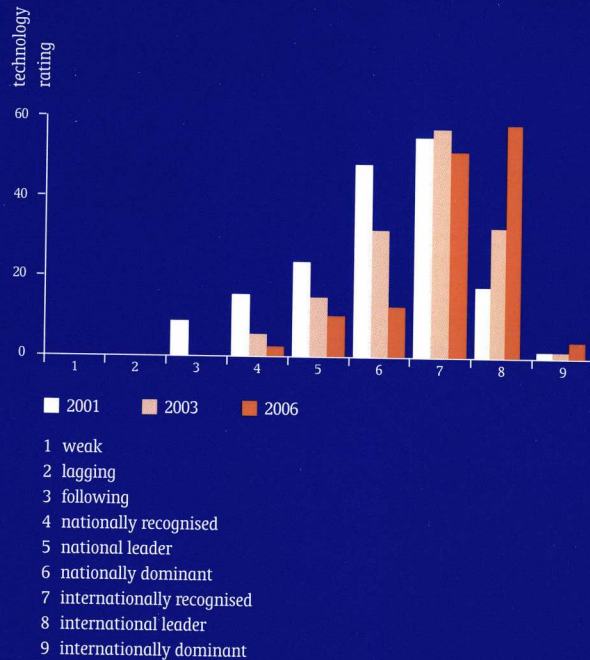
	2002	2006
Market turnover	289	315
• <i>business turnover</i>	146	159
• <i>government turnover</i>	64	69
• <i>international turnover</i>	79	87
Government funding (knowledge development)	127	122
Government assignments (defence research and geo-information)	64	54
TNO participations	57	63
Total TNO turnover	537	554
TNO results, including participations	5,7	6,6
Number of employees	5.400	5.400

Clear choices

The world around us is changing constantly. If we want to achieve our objectives, we must adapt to these changing circumstances. But we cannot do that until we know where we stand, where we want to be and, most importantly, how we want to get there. And that means making clear choices based on the strategy we employ to set the course for the organisation. This strategy is made known to both stakeholders and personnel alike. It also serves as an agreement with the government about the way we operate, and our government funding is partly based on it.

Who are we and where do we stand? These questions have been addressed in our mission statement for years. And our ambition for 2003–2006 is a statement of our aspirations. The TNO 2003–2006 Strategy Plan presents a clear picture of the vital issue of how we plan to achieve our ambition, along with what will be required from the entire organisation. We have determined five core areas and the institutes that will be responsible for ensuring their success along with the supportive processes that will





Development of TNO's technological position

be needed. This strategy plan projects less growth than the previous one because we have to devote a great deal of attention in the coming period to the internal operation of the organisation, our overall financial position and the level of government funding at TNO. Once these things have been settled, we can renew our efforts to step up growth.

In addition to presenting the strategy for TNO as a whole, we also present the strategies for each individual institute. These have been set down in the institutional policy plans that form an integral part of TNO's strategy for 2003–2006 and that are essential to TNO's overall strategy because they substantiate the outlines sketched here. And that should make it clear to everyone that it is down to what we do ourselves if the strategy for 2003–2006 is to be a true success.

Jan Dekker

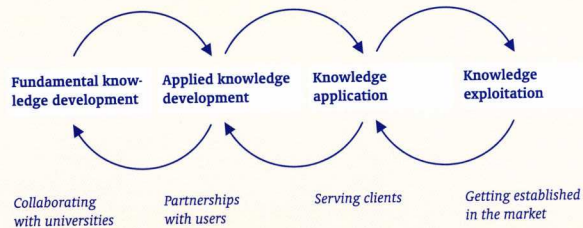
President of the TNO Board of Management

Mission

TNO is an independent contract research organisation, established by law. Its mission is:

To apply scientific knowledge with the aim of strengthening the innovative power of industry and government.

Our mission has not, therefore, changed. Neither has the bridging function we serve in the knowledge chain: to put the results of applied research in the hands of the people who can use it.



The knowledge chain: from idea to innovation

Ambition

Since European unification, the knowledge market in which we operate has become increasingly international. So TNO, certainly by 2006, has to be able to hold its own against other knowledge institutes in Europe. Our knowledge must be competitive. And in being competitive, that is good for our domestic clients and for performing our legal assignments, such as defence research, subsurface data management and the inspection of weights and measures. It also makes us an attractive party for our foreign clients and partners. Our ambition for the coming period is to evolve into a research and technology organisation (RTO) at a European level. Because only then we can provide our clients with the kind of support they need in a competitive and international environment.

Fulfilling our ambition

To fulfil our ambition, and hence our mission, we must improve our performance in two regards:

- Intrinsically: we must focus on the true strengths in our technology portfolio, which will mean making strategic

But the world around us is changing. Europe wants to develop into the most competitive and dynamic knowledge economy in the world, an objective to which the Netherlands subscribes wholeheartedly.

The Dutch ambition to belong to the European top in this regard has yet to be fulfilled, and this is partly because it takes too long for new knowledge to be turned into applications by users. The national knowledge infrastructure, of which we here at TNO form such a large part, has a key role to play. And that has certain implications. For us, it means that the stakes are being raised: our work must start having a greater impact and be performed more efficiently.

Our aim, therefore, for 2003–2006, is to:
‘Get knowledge onto the market more quickly’.

choices. We do this within our **core areas**

- Operationally: we must convey our knowledge and expertise to the market effectively. We do this through our **core activities**.



Turnover in 2006 divided according to core area



Turnover in 2006 divided according to core activity

Core areas

If we want to bring our knowledge to the market more quickly, we have to know what we want to focus on. We can do this by listening to what is going on among our clients (or potential clients). And by looking at what our competitors and partners are doing. Only then will it become obvious what areas we can really excel in. Based on the issues and types of clients that we want to focus on and the specialised knowledge we have, we have decided to concentrate on five core areas:

- **Quality of Life**
- **Defence and Public Safety**
- **Advanced Products, Processes and Systems**
- **Natural and Built Environment**
- **ICT and Services**

Three to four institutes will be particularly active in each core area, with others making additional contributions. The respective directors, chaired by a member of the Board of Management, are responsible for steering the knowledge development within the core area.

Core activities

Our mission and the function we serve as a bridge between fundamental knowledge and its application are embodied through:

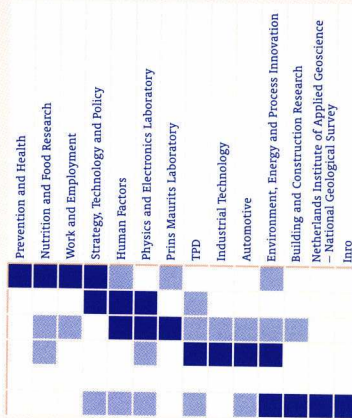
- knowledge development
- knowledge application
- knowledge exploitation

Within TNO knowledge development must always be viewed from a market perspective. We evaluate research projects in terms of the potential novel uses, in the market, of their results. Important objectives are:

- to promote and expand on partnerships with business
- to create new initiatives
- strategic planning with regard to developing knowledge
- to obtain measurable results (deliverables) for each project

Knowledge application at TNO refers to contract work. Its success is measured by the client's level of satisfaction and the degree to which our knowledge is actually used. Important objectives are:

Quality of Life
 ICT and Services
 Defence and Public Safety
 Advanced Products,
 Processes and Systems
 Natural and Built Environment



Institutes in each of the core areas

Each core area faces three strategic assignments:

- To compile and *focus* on a logically cohesive technology portfolio
- To *upgrade* the technology portfolio to make us better than we already are by, among other things, initiating groundbreaking projects in the area of knowledge development (new initiatives)
- To make a common *market approach* where necessary

- to concentrate on providing unique, customised work
- to develop and promote marketing and sales
- to improve internal collaboration for the benefit of the market
- attention for the SME sector

Knowledge exploitation at TNO is expressed through the creation of private companies, operating on a commercial basis, in which TNO participates through TNO Management BV (a limited company). Beyond this, it means trading in knowledge (granting companies access to intellectual property rights, through licensing for instance). In both cases, knowledge and expertise developed by TNO are marketed under the normal conditions of competition.

Important objectives are:

- to further improve exploitative practices (name use, licences) and link these to knowledge development
- to privatise routine activities involving the application of knowledge (number of spin-offs in 2006: 8)

Two items among our core activities warrant special attention: the selective expansion of our collaboration with universities for the link to fundamental research and the proper performance of our legal assignments.



CORE AREA

Quality of Life

Description

The main institutes operating in this core area are: TNO Work and Employment, TNO Prevention and Health, TNO Strategy, Technology and Policy and TNO Nutrition and Food Research. TNO Environment, Energy and Process Innovation, TNO Prins Maurits Laboratory and TNO Human Factors also have a direct involvement.

This core area covers the quality of human life in terms of nutrition, health, the environment and employment. Health, safety, sustainability and quality are the key concepts here. These concepts, that are of elemental concern to society, are closely associated with government policy on topics such as reliable food production, public healthcare and responsible occupational health and safety.

Value to the market and society

In the area of nutrition, TNO works for large, multinational corporations in the agrifood industry on ensuring the



OBJECTIVES AND ACTIONS FOR THIS CORE AREA IN 2003 – 2006

Focus

- policy for life sciences
- biotechnology and product innovation
- food quality and safety
- nutrition and health
- biomedicine and genomics
- health risks of chemical substances
- technology in healthcare
- health and public healthcare

quality, safety and health of food products. We also serve the pharmaceutical cluster, with the design and evaluation of new and existing medicines, biotechnology and diagnostics, among other things. In the healthcare cluster TNO works in the area of the preventive medicine and health management. We support the government and companies in finding solutions for work and employment issues, amongst others in the area of employability, stress and RSI.

TNO's aims for this core area are:

- to help formulate vision and policy in the area of the social aspects of life sciences
- to provide solutions for problems in the area of health, safety and the quality of food products
- to contribute to the diagnosis, therapy and prevention of the vascular diseases, chronic illness and infectious diseases
- to improve profitability, quality of work and participation in the labour process

- **work and health**
- **employment policy and HRM**

Upgrading (see diagram on page 2)

- **rating: from nationally dominant to internationally recognised**
- **internationally leading for technologies operating on foreign markets**

New initiatives

- **genomics, linked to national and international initiatives**
- **living and working in the information age**

Market

- **consolidate the existing TNO Pharma business centre**
- **initiate far-reaching marketing and sales partnerships in the area of nutrition, employment and healthcare**



CORE AREA

Defence and Public Safety

Description

The main institutes operating in this core area are: TNO Physics and Electronics Laboratory, TNO Human Factors and TNO Prins Maurits Laboratory. Seven other institutes are also directly involved.

First and foremost, the core area comprises the work that TNO Defence Research performs as a strategic partner for the Dutch Ministry of Defence in acquiring militarily specific, technical-scientific knowledge and expertise, and making this applicable. Also grouped under this core area is knowledge that is important in the domain of public safety.

Value to the market and society

The primary operational focus for the Ministry of Defence has shifted from large-scale defence to crisis management. The Dutch armed forces must have the capability for out-of-area deployments across the entire spectrum of possible conflict situations. The notion of an 'operational continuum'



OBJECTIVES AND ACTIONS FOR THIS CORE AREA IN 2003 – 2006

Focus

- operational deployability
- situation awareness
- physical protection
- electronic protection and information security
- modelling and simulation
- education and training
- risk analysis
- system-integrating capacity

going from national responsibilities, peacekeeping and humanitarian operations through crisis management to large-scale conflict resolution means that operational and managerial processes are merging closer and closer together.

TNO's aims for this core area are:

- to continue to assist the Ministry of Defence as a reliable, trusted partner in maintaining and the further improvement of an armed forces network that is expedient and cost-effective
- to develop our resources into a centre of expertise in the field of Public Safety at the service of the relevant departments and administering services, such as the police

- **ship structures**

Upgrading (see diagram on page 2)

- **rating: from internationally recognised to international leader in some areas**
- **upgrading of Public Safety business centre (consultancy at the systems level, account management, research programme)**

New initiatives

- **step up the collaboration with foreign institutions**
- **step up the collaboration with Ministry of Defence training centres**
- **enlarge the capacity for system integration**
- **initiate projects in NATO/RTO panels**

Market

- **expand spin-offs to the civilian domain**



CORE AREA

Advanced Products, Processes and Systems

Description

The main institutes operating in this core area are: TNO Industrial Technology, TNO Environment, Energy and Process Innovation, TNO Applied Physics and TNO Automotive. TNO Physics and Electronics Laboratory and TNO Nutrition and Food Research are also directly involved.

This core area targets businesses in the national and international manufacturing and process industry, their suppliers and related knowledge-intensive sectors – primarily R&D organisations – that produce advanced systems, products or processes. The core area covers the entire evolutionary process: materials and product development, design, engineering, work preparation, processing technologies and control systems for the manufacturing process.

Value to the market and society

Developments in this core area are greatly influenced by



OBJECTIVES AND ACTIONS FOR THIS CORE AREA IN 2003 – 2006

Focus

- materials technology
- product development
- process innovation
- energy systems
- crash safety
- new vehicles and transport systems
- vehicle powertrains
- process modelling and control systems

trends such as the growing complexity of products and systems, the rise of information technology and sustainable entrepreneurship. With the discrete production industry seeking added value in employing new materials and processing techniques in products and constructions, the range of products in the processing industry is increasing and this demands flexible and efficient sorting and conversion processes.

TNO's aims for this core area are:

- to excel at innovative product development, production processes and materials applications for the manufacturing industry
- to excel at designing advanced instruments at systems level
- to position ourselves in the processing industry
- to contribute to making modes of transport safer, cleaner and more efficient

- **acoustics and vibrations**
- **instrumentation and information systems**
- **optical instrumentation**

Upgrading (see diagram on page 2)

- **from nationally dominant to internationally recognised**

New initiatives

- **initiate system innovations in sustainable development**
- **nanotechnology**
- **microsystem technology**

Market

- **consolidate the existing TNO Chemistry and TNO Space business centres**
- **initiate marketing and sales partnerships in Safety and Business**
- **initiate marketing and sales partnerships in Aerospace**



CORE AREA

Natural and Built Environment

Description

The main institutes operating in this core area are: TNO Building and Construction Research, TNO Inro, TNO Environment, Energy and Process Innovation and the Netherlands Institute of Applied Geoscience TNO – National Geological Survey. Five other institutes are also directly involved.

This core area is concerned with the management, planning and use of the Netherlands. The management of subsurface natural resources and subterranean space along with tackling environment (terrestrial) and environmental hazards are the primary issues. Planning comprises both land use and mobility, the former involving such things as installing infrastructure (i.e. civil engineering work) and building construction.

Value to the market and society

Access to permanent information on the subsurface is



OBJECTIVES AND ACTIONS FOR THIS CORE AREA IN 2003 – 2006

Focus

- policy and planning
- infrastructure and planning
- buildings and engineering structures
- ecology
- geoscience

Upgrading (see diagram on page 2)

- from nationally dominant to internationally recognised

crucial for urban development, agricultural and ecological resources and sustainable land use. Lack of space and an overburdened infrastructure are problems that involve weighing various social interests against one another in a complicated decision-making process. A balance must be found between the need for mobility and how this adversely affects accessibility, sustainability and safety. The Dutch Ministries of Housing, Spatial Planning and the Environment; Transport, Public Works and Water Management; and Economic Affairs are the key ministries in this core area.

TNO's aims for this core area are:

- to contribute to the policy development and decision-making process with regard to spatial and sustainable development
- to evolve into a European 'centre of excellence' in geoscience
- to contribute to the creation of innovative logistics systems and transport systems
- to be a partner in the starting phases for infrastructure projects and innovation in chain processes in the construction industry and sustainable innovation in local systems

New initiatives

- regional and urban innovation
- sustainable transport systems

Market

- consolidate the existing TNO Traffic and Transport and TNO Soil and Sediment Remediation Research business centres
- initiate marketing and sales partnerships in the area of spatial planning and water management



CORE AREA

ICT and Services

Description

The main institutes operating in this core area are: TNO Physics and Electronics Laboratory, TNO Human Factors and TNO Strategy, Technology and Policy. TNO Applied Physics is also directly involved.

Information and Communication Technology (ICT) is a broad field and, as applied within TNO itself, is strongly associated with discipline and domain-specific knowledge. The core area concerns the computerisation of society, specialising in the successful application of ICT for use in service provision by the government and business.

Value to the market and society

The mechanics of society are increasingly dictated by the manner in which information is used to retain and create economic value. Businesses and government agencies therefore invest vast sums of money in ICT architecture in order to give their operating processes a more efficient



OBJECTIVES AND ACTIONS FOR THIS CORE AREA IN 2003 – 2006

Focus

- ICT policy studies
- infrastructures and products
- operating processes and information management
- user-friendliness and behaviour

Upgrading (see diagram on page 2)

- from internationally recognised to international leader in some areas

form. TNO wants to contribute to this through the development and innovative application of ICT in organisations that rely heavily on ICT in their production processes and distribution channels. The Dutch Ministries of Economic Affairs and of Education, Culture and Science are key ministries in this core area.

TNO's aims for this core area are:

- to help develop a vision on the social aspects of ICT
- to evolve into an authoritative architect for defining information architectures and centre of expertise for R&D-based support for infrastructures
- provide insight into the factors that influence the user-friendliness and behavioural aspects of ICT systems
- play a role in optimising the operating processes of ICT-intensive service providers – particularly those in government – through the application of ICT

New initiatives

- programme support for Open Services Innovation Laboratory

Market

- consolidate the existing TNO Multimedia and Telecommunications business centre
- launch new initiative Open Services Laboratory

The TNO organisation

Expert employees, sound finances, structured quality management and effective communication are prerequisites for achieving our business goals.

Personnel

The objective of the Human Resources policy is to maintain suitable staffing levels in an effort to improve performance and operating results. An appropriate staffing capacity will be achieved through various flows in the workforce. The personal development of our employees remains a priority.

Staff	5.400
Inflow	8–10%
Internal mobility	6–8%
Outflow	8–10%
Ratio of temporary / permanent contracts	20–80
External staff (assistant trainees, interns, temporary)	15%

Staffing capacity in 2006

Major objectives and actions for 2003–2006

- turnover growth of 3%
- increase results in purchasing
- improve productivity
- improve operating results
- improve the liquidity and equity positions
- implement systems for e-business, e-procurement and knowledge management

Quality

Structured quality management helps us provide clients with optimal service. We are already familiar with forms of quality management like technology audits, customer satisfaction surveys, employee satisfaction surveys and quality audits like those by ISO, Sterlab, GLP and GCP.

Major actions for 2003–2006

- continue with present auditing system and measuring the realisation of our strategic objectives
- reinforce the connection between the improvement

The practice of thinking and acting from a technology perspective must shift to thinking and acting from a client perspective. The five TNO lines of development and the eleven TNO competencies, and the connections between them, can serve as aids in accomplishing this.

Major objectives and actions for 2003–2006

- active recruitment of top scientists
- professionalise line management with TNO's 'Next Step Management' programme
- expand on Personal Development Plan in the result, development & coaching talks
- professionalise project management
- customised personal career planning

Finances

Healthy financial ratios and good results are vital to the organisation's continuity.

initiatives performed in response to the various audits undertaken

Communication

Effective internal and external communication helps us achieve our organisational objectives. For 2003–2006, the communication objectives and actions aimed at accomplishing this are:

External

- establish an unambiguous position for TNO, so that TNO acquires a top-of-mind position in the field of innovation among the top echelons of our clients
- exploit the five core areas to spotlight TNO's activities
- maintain TNO's reputation among the public at large

Internal

- communicate organisational goals
- provide policy information
- provide job information through management

Ethics

TNO is deeply concerned with ethical issues. That is why we established a Platform on Ethics and Research in 1999. We also have a Medical Ethics Committee and an Animal Experiments Committee.

Four values are central to the TNO-code:

- integrity
- independence
- professionalism
- social responsibility

These values will be actively discussed and conveyed within TNO. The Platform will systematically report on their application and observance.

Making technology work

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