

GOOD WORK



TNO innovation
for life

PROJECTS OF
THE WORK & EMPLOYMENT
INNOVATION AREA

› GOOD WORK IS
HEALTHY, SAFE
AND EFFICIENT,
BUT ALSO
ENJOYABLE,
STIMULATING
AND CHALLENGING.
GOOD WORK
HELPS MAKE
LIFE BETTER
AND IS VITAL
FOR PRODUCTION
AND INNOVATION.

INNOVATIONS FOR WORKPLACE HEALTH AND SAFETY

The research conducted in the Innovations for Workplace Health and Safety business line contributes demonstrably and cost-effectively to preventing and lowering the burden of disease among employees as a result of health and safety issues at work.

The research also helps in the timely detection, evaluation and monitoring of new risks associated with technological trends. A key factor is the ability of companies, i.e. employers and employees alike, to manage any existing and emerging risks themselves.

The specimen projects undertaken in this business line and presented in this booklet are categorized into three main groups:

1. IMPLEMENTATION AND EVALUATION OF OSH POLICIES

This research focuses on improving working conditions by applying and evaluating health and safety policy.

2. RISK MANAGEMENT IN OSH

The research objective is to prevent or reduce the disease burden for employees through innovative interventions in Occupational Safety and Health (OSH).

3. CHEMICAL EXPOSURE AND RISK ASSESSMENT

The aim of this research is to develop models and approaches for working safely with nanoparticles and chemicals, to ensure that their uncertain risks do not constitute an obstacle to innovation.

SUSTAINABLE EMPLOYABILITY

The aim of research in the Sustainable Employability business line is to promote the sustainable employment and employability of the labour force by improving vitality, qualifications, mobility and the working environment.

The specimen projects undertaken in this business line and presented in this booklet are categorized into three main groups:

1. PARTICIPATION AT THE BOTTOM OF THE LABOUR MARKET

This research contributes to finding solutions for the hundreds of thousands of people who are on the margins of the labour market. An aspiration with these projects is to offer these people a prospect of work and sustainable employability.

- Reintegration professionals improve services to employers 58
- Collaborating better on social return 60
- Objective measure of inclusive employment 62
- Better control of the reintegration of benefit recipients 64

2. SUSTAINABLE WORK

This research revolves around developing innovations to sustainably strengthen companies' competitiveness by raising the sustainable employability and productivity levels of working people.

- National Employability Plan: more people lead longer, healthier working lives 66
- Sustainable employability deciphered 68
- How can people remain employable beyond the age of 45? 70
- Skilled workers control their own development 72
- How workers keep their skills up-to-date 74
- Which lifestyle programmes work for companies? 76
- Staying sustainably employable in the construction industry 78

3. MENTAL HEALTH AND PSYCHOSOCIAL WORKLOAD

This research is concerned with solutions that lead to less attrition and higher productivity in the workplace, either by reducing the psychosocial workload or by enhancing employees' work engagement.

- How can we stop workers from slipping into mental retirement? 80
- Healthier restructuring with PSYRES 82
- Game gives managers a handle on managing work-related stress and work engagement 84
- Revealing the costs and benefits of anti-aggression policy 86
- Clarifying the impact of work stress 88
- Happy@Work: online self-help for psychological symptoms 90

INNOVATION AND LABOUR PRODUCTIVITY

The aim of the Innovation and Labour Productivity programme is to increase innovative strength and labour productivity through the better utilization of human capital and social innovation.

The specimen projects undertaken in this business line and presented in this booklet are categorized into three main groups:

1. CARE AND WORK

The aim of this research is to develop, implement and evaluate integrated care concepts that are intended to counter the growing social cost of care, to increase labour productivity in the care sector, and to shed light on the relationship between technological and social innovations in the care sector.

- Care providers in Amsterdam-Noord are working together better 94
- Giving integrated care a helping hand 96
- Greater participation through work-oriented healthcare 98

2. SOCIAL INNOVATION MANAGEMENT

This research objective is to increase labour productivity and innovative strength by developing knowledge, concepts and methods in innovative organizational concepts, flexible organizations, and learning, working and innovating by working people and social schemes.

- Working Smarter practices in public administration 100
- No obstacles to public sector workers with innovative ideas 102
- Working more productively as an alternative to cutbacks 104
- A complete collection of figures about flexible work and flexible workers 106

3. INNOVATIVE WORK

This research is intended to increase the innovative strength and labour productivity in organizations in the High Tech Systems and Materials (HTSM) and Creative Industry top sectors. The approach is through improved interaction between people and products, environments, processes, and organizations, and through innovative developments in the field.

- Virtual and augmented reality improve working conditions and productivity 108

› PREFACE

› WORK IS AN IMPORTANT PART OF OUR LIVES AND THEREFORE INVESTING IN 'GOOD WORK' IS ESSENTIAL. ORGANIZATIONS CLEARLY HAVE TO DO ALL THEY CAN TO PROTECT THEIR EMPLOYEES AGAINST ANY ADVERSE IMPACT AND RISKS THEIR WORK MAY INVOLVE, WHILE MISSING NO OPPORTUNITY TO ENHANCE THE BENEFICIAL EFFECTS OF WORK, SUCH AS HIGH MOTIVATION, SATISFACTION, PERSONAL DEVELOPMENT AND A STIMULATING ORGANIZATION CULTURE. GOOD WORK IS HEALTHY, SAFE AND EFFICIENT, BUT ALSO ENJOYABLE, INSPIRING AND CHALLENGING. GOOD WORK HELPS MAKE LIFE BETTER AND IS VITAL FOR PRODUCTION AND INNOVATION. ALL THESE ASPECTS OF WORK UNFOLD IN THIS BOOKLET, AS THE TNO WORK & EMPLOYMENT INNOVATION AREA PRESENTS FIFTY PROJECTS CONCERNED WITH PEOPLE, ORGANIZATIONS AND WORK.

Various different lines can be identified in the research. Some of the projects focus on the step from unemployment to employment: how can we help people who have become isolated from the labour market to find work again? One such project is the Inclusive Employment Performance Ladder, which encourages companies to take a more inclusive approach to employment and to contribute more to the labour market participation of vulnerable groups.

Another line leads from work to sustainable work. How can we promote a sustainable labour market, in which people stay healthy and continue working for longer and with pleasure, while also staying productive? The business community must invest in the health, vitality, improved skills and commitment of workers, from the very top to the very bottom. But at the same time the role of employees and self-employed people is also changing. They are expected to have an open and flexible attitude, to be willing to develop themselves and to retain their value for their current and future employers. A project that illustrates this aspect is 'The future Craftsman', for which TNO has developed an e-learning environment to support companies and employees in this lifelong learning process.

The third line that I would like to mention is the trend towards innovating organizations. A rapidly changing society with rapidly changing markets needs organizations that continuously renew and improve themselves. How can individual companies and networks improve their competitive-

ness and resilience at the same time as encouraging their employees to go along with this development? Meanwhile, how can we be sure that unknown risks will not slow down tomorrow's innovations, such as the development of nanomaterials? Or how can the public sector organize work in a smarter and more efficient way? The Smarter Network project is about reorganizing work from the inside out, by creating 'do tanks' in which innovative professionals from different domains in the public sector work together on new solutions for practical problems.

The TNO slogan is 'Innovation for life'; TNO is committed to both technological and social innovation. The projects presented in this booklet clearly demonstrate that truly effective innovation also innovates the organization and involves the workers. These links between technology, people and organization are brought together in the Work & Employment projects.

Our added value is our emphasis on practical advice and solutions, but always with a firm scientific underpinning. This too helps to create innovations that work.

This booklet showcases our research. Dozens of fascinating projects reveal just how we can use new knowledge to solve issues for industry, the public sector and other organizations. Each project testifies to the benefit of investing in good work: in employees, their working conditions, their involvement and in the organization of work itself. We hope you enjoy reading this booklet as much as we enjoyed making it!

Prof. P.M. Bongers PhD
Director of Innovation,
TNO Work & Employment







INNOVATIONS FOR WORKPLACE HEALTH AND SAFETY

**IMPLEMENTATION AND
EVALUATION OF OSH POLICIES**

RISK MANAGEMENT IN OSH

**CHEMICAL EXPOSURE
AND RISK ASSESSMENT**

EUROPE-WIDE SHARING OF OCCUPATIONAL SAFETY KNOW-HOW

› A WORK-RELATED DEATH OCCURS SOMEWHERE IN THE EU EVERY THREE AND A HALF MINUTES. THIS AMOUNTS TO OVER 150,000 DEATHS EVERY YEAR DUE TO ACCIDENTS AT WORK OR WORK-RELATED ILLNESS. STEPS TO ENSURE THAT EMPLOYEES AND EMPLOYERS IN EUROPE ARE MORE ALERT TO THE RISKS INVOLVED IN THEIR WORK, AND LEARN HOW TO HANDLE THEM, ARE THEREFORE VERY IMPORTANT. TO RAISE AWARENESS OF THE ISSUES INVOLVED, THE EU HAS SET UP A NETWORK OF NATIONAL KNOWLEDGE CENTRES, KNOWN AS FOCAL POINTS. TNO PROVIDES THE DUTCH FOCAL POINT ON BEHALF OF THE DUTCH MINISTRY OF SOCIAL AFFAIRS AND EMPLOYMENT.

From Agency to Focal Points

The European Agency for Safety and Health at Work aims to make Europe a safer, healthier and more productive place to work. The Agency gathers and disseminates knowledge and information, and promotes a culture of risk prevention. However, this objective cannot be achieved by a central organization acting alone, which is why the Agency works together with a network of national Focal Points. Many of these are the leading occupational safety and health organizations within the individual Member States. All information flowing to and from the Agency passes through the Focal Points.

An active health and safety approach

TNO's partners in the Dutch Focal Point are representatives of the government, employers and employees, and all of them actively pursue the Agency's objectives. The partners keep a close watch on developments in order to detect any new risks, to build up a body of best practice for promoting risk prevention, to run campaigns, and to provide information. They also supply the Agency with the latest information from the Netherlands, and pass information from the Agency to Dutch policymakers, and people at all levels who are concerned with employment practice. The Focal Point has a central role in the network of employers' organizations, trades unions, professional organizations, occupational health professionals and knowledge institutes.

Many information channels

The Focal Point aspires to being the authoritative point of reference for all relevant safety and health information for the Agency's target groups. It disseminates information through a variety of websites (including www.arboineuropa.nl), as well as through e-mail newsletters and Twitter.



According to the European Agency: 'We can safely say that we have been kept well informed about the activities happening in the Netherlands and we are impressed; the system encourages and engages social partners, experts, and governments to achieve a better working life for those in work and create more opportunities for others to enter the job market.'

'THE DUTCH FOCAL POINT IS THE TWO-WAY INTERFACE BETWEEN EUROPEAN AND DUTCH OCCUPATIONAL SAFETY AND HEALTH EXPERTISE.'

PROJECT Dutch Focal Point for safety and health at work

RESEARCH PROGRAMME The Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl)

A MORE PROMINENT POSITION FOR PREVENTION OFFICERS

THE RESPONSIBILITY FOR WORKPLACE HEALTH AND SAFETY IN THE NETHERLANDS IS SHARED BETWEEN EMPLOYERS AND EMPLOYEES, AS THE LAW REQUIRES. EVERY COMPANY IS OBLIGED TO HAVE A PREVENTION OFFICER, WHO SHOULD HAVE A KEY ROLE IN INTERNAL PREVENTION ACTIVITIES. IN PRACTICE, HOWEVER, TOO FEW COMPANIES HAVE YET APPOINTED A PREVENTION OFFICER. TNO IS HELPING COMPANIES IMPROVE THEIR INTERNAL HEALTH AND SAFETY EXPERTISE.

Too few people and insufficient knowledge

Currently, only one in every two Dutch companies has a prevention officer. Furthermore, knowledge and usable instruments for prevention officers are in short supply, especially in SMEs. TNO accordingly investigated what companies and prevention officers need to improve their own health and safety expertise.

Three building blocks for improvement

Three building blocks emerged from our research that would help raise prevention awareness in companies. The first point is the importance of prevention officers being actively and personally involved in their duties, which implies a need for greater self-reliance and self-activation. Then, prevention officers must be a more visible part of a company. Thirdly, a greater range of training courses is needed.

The state secretary for Social Affairs and Employment comments:

‘Prevention officers are still something of a rarity in companies, and their knowledge of working conditions is sometimes limited. I am working on strengthening this first line of workplace prevention. TNO’s Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl) is helping trade unions and employers’ organizations make prevention officers more visible and expert.’



Think tank and knowledge platform

TNO and the target group are developing activities and instruments that match their needs. We set up the “inPreventie” think tank, and its members assist and exchange ideas with our development team on a regular basis. We are also developing a digital platform that is run for and by prevention officers: www.inPreventie.nl. This site is a vital resource that gives prevention officers access to the knowledge, contacts and markets they need to carry out their duties successfully.

**‘GREATER
PREVENTION
AWARENESS
MAKES HEALTHIER,
SAFER WORKPLACES!’**

PROJECT Health and safety expertise: enhancing in-company prevention
RESEARCH PROGRAMME The Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl)

ESTIMATING THE IMPACT OF HEALTH AND SAFETY MEASURES

› WHAT IS THE HEALTH AND SOCIOECONOMIC IMPACT OF CHANGES IN THE WORKING CONDITIONS ACT? SUPPOSE THE CONSTRUCTION INDUSTRY WERE TO ADOPT NEW RULES FOR LIFTING HEAVY WEIGHTS, WHAT IMPACT WOULD THAT HAVE ON THE BURDEN OF LOWER BACK PAIN? TNO RESEARCH ALLOWS POLICYMAKERS IN PUBLIC AUTHORITIES AND INDUSTRY TO FORECAST MORE CLEARLY THE IMPACT OF PROPOSED MEASURES.

New predictor

The Health Impact Assessment (HIA) in combination with a cost-benefit analysis (CBA) is an important forecasting tool for the impact of measures. Unfortunately, performing an HIA-CBA is no simple matter, and requires substantial knowledge about workers' health and employability. This led TNO to devise a new approach to occupational health issues, which we call the Occupational Safety and Health Impact Assessment (OSHIA).

Tool for policymakers

OSHIA provides a clear picture of the impact of a change in health and safety policy or an intervention on costs and benefits as well as on health. The tool supports evidence-based decision making that is timely, affordable and feasible. It is timely because it assesses the impacts before a policy is adopted. It is affordable and feasible because it is based on existing data with expert TNO knowledge and state of the art econometric techniques. It is a practical tool for policymakers that estimates the national and international impact of policy decisions.

Costs and benefits revealed

A novel feature of the approach is that it factors in the inevitable uncertainty in any measure, giving policymakers a clearer view of their freedom to manoeuvre in a given case. The tool also supports a clear cost-benefit analysis of changes in the work. OSHIA therefore helps produce reliable estimates of both the effectiveness and cost-efficiency of proposed measures.

› ‘OSHIA HELPS
FORECAST THE
POTENTIAL IMPACT
OF PROPOSED
HEALTH AND SAFETY
MEASURES.’

PROJECT Health Impact Assessment and cost-benefit analysis

RESEARCH PROGRAMME TNO Central government grant for Work and Health

HOW COST-EFFECTIVE ARE WORKPLACE INTERVENTIONS?

A VARIETY OF INTERVENTIONS ARE AVAILABLE TO PROMOTE EMPLOYEE HEALTH. ONE EXAMPLE IS THE USE OF BREATHING PROTECTION DEVICES OR EXTRACTION INSTALLATIONS IN THE CONSTRUCTION INDUSTRY TO REDUCE EXPOSURE TO HAZARDOUS SUBSTANCES. IN ADDITION TO EFFECTIVENESS, ANOTHER IMPORTANT CONSIDERATION WHEN MAKING A CHOICE BETWEEN DIFFERENT OPTIONS IS THE INVESTMENT INVOLVED. WHICH INTERVENTIONS ARE MOST COST-EFFECTIVE?

Selecting interventions that are both effective and efficient

While new policy and treatment methods in the healthcare sector are commonly evaluated to determine their cost-effectiveness, evaluations of work-related interventions are relatively rare. For instance, there are a variety of measures to protect workers against dust, but how cost-effective is, say, 'wet dust suppression' (which involves spraying water in the working environment) compared to the use of breathing protection devices? In this research project, we aim to gain insight into this issue: which workplace interventions are not only effective, but provide value for money, or even yield financial gain?

Computational model

In this project, we have developed a cost-benefit framework and together with our clients (companies, public authorities and insurers), we use this instrument to evaluate the costs and benefits of interventions relevant to their specific situations. The resulting computational models categorize the costs and benefits for various stakeholders, including employers, employees and the community at large.

'THE INSTRUMENT PROVIDES VALUABLE INFORMATION ABOUT THE COSTS AND BENEFITS OF VARIOUS INTERVENTION STRATEGIES.'

Reliable cost-effectiveness estimates

The computational models that we develop yield reliable information about the effectiveness and efficiency of workplace intervention strategies to support decision making; that is, information about changes in disease burden and corresponding costs and benefits. To date, we have used the instrument to evaluate a variety of intervention strategies, such as wet dust control systems in the construction industry and a change in European policies on risk assessment.

PROJECT Are workplace interventions cost-effective, and for whom?

RESEARCH PROGRAMME TNO Central government grant for Work and Health

BETTER MEASURES AGAINST RESPIRATORY DISEASES

EXPOSURE TO HAZARDOUS SUBSTANCES IN THE WORKPLACE IS A SIGNIFICANT CAUSE OF RESPIRATORY DISEASES. IT GOES WITHOUT SAYING THAT PREVENTIVE MEASURES ARE ESSENTIAL – BUT WHICH ONES WORK BEST? BESIDES, INTERVENTIONS CAN BE EXPENSIVE, SO WHICH INTERVENTIONS GIVE THE BEST VALUE FOR MONEY? A TNO STUDY HAS SHED LIGHT ON THE EFFECTIVENESS AND COST-EFFICIENCY OF VARIOUS INTERVENTION STRATEGIES.

Health risks at work

Respiratory diseases caused by exposure to harmful substances are among the most serious occupational illnesses. As things stand, the scant evidence of the effectiveness of intervention programmes for hazardous substance exposure in the workplace renders decision-making on new preventive measures little more than guesswork. There is also little clarity about the costs and benefits of these measures, which is an important aspect for employers, who often have to foot the bill for the interventions.

What makes an intervention effective?

The study focuses on the construction and car repair industries. The objective is to develop an intervention programme that will help reduce the burden of disease and of chronic respiratory diseases in particular. We are meticulously analysing exactly what determines the effectiveness of certain intervention strategies. We are looking beyond the technical features of interventions to the organizational and human factors, using predictive models to determine how a change in exposure will change the disease burden in terms of the number of people affected, the degree of absence through illness, and the consumption of healthcare services. We are also evaluating the effectiveness and cost-efficiency of various exposure-limiting measures and intervention strategies.

Ideas from the industry

We are working on this study together with individual companies and the trade associations Arbouw and FOCWA. The terms of the study require commitment from all parties and their careful consideration of feasibility



aspects. Clear communication and the involvement of employees and employers are essential if we are to reach our shared goal of greatly reducing exposure on site and of providing industry-wide guidelines for more effective prevention of occupational respiratory diseases.

‘WE ARE LOOKING BEYOND THE TECHNICAL FEATURES OF INTERVENTIONS TO THE ORGANIZATIONAL AND HUMAN FACTORS.’

PROJECT The effectiveness of interventions for reducing exposure to substances that are harmful to the respiratory system; a study with firms from the construction and car repair industries

RESEARCH PROGRAMME Netherlands Organisation for Health Research and Development (ZonMW); TNO Central government grant for Work and Health

CLARIFYING THE CAUSES OF ACCIDENTS AT WORK

ACCIDENTS AT WORK ARE A SOURCE OF BOTH PERSONAL SUFFERING AND COSTS FOR EMPLOYERS AND THE COMMUNITY AT LARGE. AT THE REQUEST OF THE MINISTRY OF SOCIAL AFFAIRS AND EMPLOYMENT, THE CONSUMENT EN VEILIGHEID FOUNDATION AND TNO DEVELOPED A METHODOLOGY IN 2001 FOR PRODUCING CLEAR AND RELIABLE ACCIDENT FIGURES, WHICH WE CALLED THE DUTCH WORKPLACE ACCIDENTS MONITOR. WE USE THIS MONITOR PERIODICALLY TO QUANTIFY THE STATUS WITH RESPECT TO ACCIDENTS AT WORK IN THE NETHERLANDS.

Monitoring figures and high-risk groups

The Workplace Accidents Monitor gives extensive statistics about accidents at work in the Netherlands. These are based on statistics about accidents in which someone is injured (including time lost to injuries), emergency department treatment and hospital admissions following accidents at work, and about fatal accidents at work. Besides figures, the Monitor has information about high-risk groups, work characteristics and consequences. We also add information about the circumstances and trend analyses.

According to a user:

'As an industrial clothing manufacturer, the Workplace Accidents Monitor is of enormous value to us in pinpointing where protective clothing can help prevent accidents at work.'

Monitor proves its value to industry

The figures put Dutch companies and industries in a position to assess and improve their own workplace accident prevention performance. Public authorities are able to use the information as a basis for policy decisions. Since 2001 the Monitor has proved its value as a central, clear and reliable source of information about accident figures.

From Monitor to Arbobalans

The 2010 Workplace Accidents Monitor, which was published in 2012, was the final report in the series. We will publish the workplace accident figures for 2011 and later every two years in the 'Arbobalans'.



**‘BESIDES FIGURES,
THE MONITOR HAS
INFORMATION ABOUT
HIGH-RISK GROUPS,
WORK CHARACTERISTICS
AND CONSEQUENCES.’**

PROJECT Dutch Workplace Accidents Monitor

RESEARCH PROGRAMME The Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl)

MONITORING THE WORKING POPULATION IN THE NETHERLANDS

THE NETHERLANDS WORKING CONDITIONS SURVEY IS THE LARGEST PERIODIC STUDY OF THE EMPLOYMENT SITUATION OF DUTCH WORKERS. TNO CARRIES OUT THE NETHERLANDS WORKING CONDITIONS SURVEY TOGETHER WITH STATISTICS NETHERLANDS. THE SURVEY IS CO-FUNDED BY THE MINISTRY OF SOCIAL AFFAIRS AND EMPLOYMENT. OVER 23,000 WORKERS TAKE PART IN THE SURVEY EACH YEAR. THE FIRST SURVEY WAS IN 2003.

Trends in work revealed

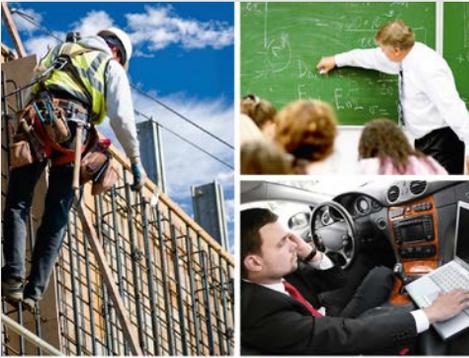
By annually consulting a large, representative sample of workers, the Netherlands Working Conditions Survey monitors the quality of work in the Netherlands in a structured manner. The survey tracks trends in the labour situation (working conditions, job content, labour relations and conditions of employment), health, worker performance and employability, and measures that affect employers. We also study the interrelationships between these trends.

A much-used information resource

The Netherlands Working Conditions Survey is a central information resource about work, for policymakers, academics, employers, trade unions, trade associations, and others. The survey output is frequently used for legislative and policy evaluation, academic research and the development of practical instruments for public authorities and industry. Dozens of researchers and professionals are engaged to translate the data from earlier surveys into relevant information. The results appear in publications every week, in academic resources, journals, reports, guidelines and recommendations, newspapers and on the Internet.

TNO and Statistics Netherlands

TNO coordinates the survey, which has 200 questions and receives responses from some 23,000 workers every year. Our partner Statistics Netherlands is responsible for sampling and weighting the data to render them representative for the entire Dutch working population. The Netherlands Working Conditions Survey is also incorporated in the Statistics Netherlands Social Statistics Database. Additional information can be found on www.tno.nl/nea.



WORK LIFE IN THE NETHERLANDS



‘THE NETHERLANDS
WORKING CONDITIONS
SURVEY IS A CENTRAL
RESOURCE FOR OFFICIAL
POLICY AND ACADEMIC
RESEARCH, WITH TREND
FIGURES FOR THE
LABOUR SITUATION IN
THE NETHERLANDS.’

PROJECT The Netherlands Working Conditions Survey

RESEARCH PROGRAMME TNO Central government grant for Work and Health,
the Joint Programme for Occupational Safety and Health in the Netherlands
(JPOSH-nl)

SURVEY CLARIFIES EMPLOYMENT POLICY ISSUES

WHAT IS THE STATUS OF WORKING CONDITIONS AND LABOUR RELATIONS IN DUTCH INDUSTRY? WHAT ACTION ARE COMPANIES TAKING IN THE AREA OF SOCIAL INNOVATION AND SOCIAL POLICY? HOW DO EMPLOYERS APPROACH PEOPLE WHO ARE LESS ENGAGED WITH THE LABOUR MARKET? THE NETHERLANDS EMPLOYERS WORK SURVEY (NEWS) ANSWERS QUESTIONS OF THIS KIND. THE REPORTS BASED ON NEWS ILLUMINATE THE WORK-RELATED SITUATION IN COMMERCIAL AND NONPROFIT ORGANIZATIONS IN THE NETHERLANDS.

Biannual status

NEWS has been conducted on a periodic basis in 2008, 2010 and 2012 among 5,000 commercial and nonprofit organizations. The aim is to track work-related trends in organizations. NEWS is a joint initiative of TNO and the Ministry of Social Affairs and Employment. A cross-sectional sample of commercial and nonprofit organizations is used each time the survey is performed. The questionnaires are completed by the CEO or HR manager.

Wealth of information

From working conditions to absence through illness, from innovation to sustainable employability: NEWS provides a comprehensive picture of work in the Netherlands. Company policies on work-related issues are set out clearly and categorized according to branch of industry and size. A methodological report and brochures with the salient findings are published every two years, and they can be found on www.monitorarbeid.tno.nl.

For employment policy and academic research

NEWS is a source to support employment policy and related academic research. Data from NEWS are used as input for the Arbobalans, a national report on working conditions and related policy and numerous analyses in reports and articles. In addition, NEWS is an important resource for government ministries including Social Affairs and Employment and Economic Affairs, as well as organizations of employers and trade unions, politicians and social institutions. The findings are a basis for specific measures on industry or sector levels.



‘NEWS IS A SOURCE OF FIGURES ON WORK AND EMPLOYMENT FROM THE EMPLOYER’S PERSPECTIVE FOR POLICYMAKERS AND ACADEMIC RESEARCHERS.’

PROJECT NEWS: Netherlands Employers Work Survey

RESEARCH PROGRAMME TNO Central government grant for Work and Health, the Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl)

THE WORKING SITUATION OF SELF-EMPLOYED PEOPLE

› MANY PEOPLE IN THE NETHERLANDS ‘WORK FOR THEMSELVES’. SELF-EMPLOYED PEOPLE ARE A GROWING SEGMENT OF THE LABOUR FORCE. STATISTICS NETHERLANDS ESTIMATES THAT THERE ARE 1.1 MILLION SELF-EMPLOYED PEOPLE. THE SUBGROUP WHO HAVE NO EMPLOYEES OF THEIR OWN IS GROWING PARTICULARLY FAST. TNO AND STATISTICS NETHERLANDS ARE CONDUCTING THE SELF-EMPLOYED LABOUR SURVEY IN ORDER TO FIND OUT MORE ABOUT THE WORKING CONDITIONS OF SELF-EMPLOYED PEOPLE. A DECISION WILL BE TAKEN ON CONTINUATION IN LIGHT OF PILOT SURVEYS HELD IN 2012 AND 2013.

A special group

Self-employed people form a special group on the labour market. For instance, many self-employed people carry on working later in life, often have little income security and would appear to be ill less often. While much is known about the work situation of people in regular employment, there is scant information about the circumstances and conditions in which self-employed people work.

A broad picture of the working situation

The topics covered in the Self-Employed Labour Survey correspond with the questions in the Netherlands Working Conditions Survey (see page 18). They cover the physical, mental and emotional load, safety and accidents at work, working conditions, sustainable employability, health, productivity, and dependence on customers and clients.

Focus group

We worked on the design of the study and the questionnaire with a focus group that includes representatives of several ministries, platforms representing self-employed people and a number of academics. Statistics Netherlands selected 22,000 self-employed people, who were formally invited to take part in a web-based survey. We are aiming for a net response of 5,000 self-employed people. When the initial results are published in 2013, the work situation of self-employed people will be clearer and we will know if it differs from that of regular employees.

Additional information can be found on www.monitorarbeid.tno.nl.

› 'THE OUTPUT WILL ALLOW TRADE ASSOCIATIONS, INTEREST GROUPS AND THE GOVERNMENT TO RESPOND MORE ALERTLY TO THE NEEDS OF SELF-EMPLOYED PEOPLE.'

PROJECT Self-Employed Labour Survey

RESEARCH PROGRAMME TNO Central government grant for Work and Health, the Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl)

HEALTH AND SAFETY IN THE CHINESE MINING AND CHEMICALS INDUSTRIES

WORKPLACE HEALTH AND SAFETY IS BECOMING EVER MORE IMPORTANT IN THE FAST-GROWING CHINESE ECONOMY. WORKING CONDITIONS IN MANY INDUSTRIES ARE POOR AND SAFETY IS A MAJOR CONCERN. A CONSORTIUM OF EUROPEAN ORGANIZATIONS, INCLUDING TNO, IS HELPING THE CHINESE GOVERNMENT TO BRING STANDARDS AND WORKING METHODS INTO LINE WITH THOSE IN THE EUROPEAN UNION. THE CONSORTIUM RECEIVES SUPPORT THROUGH THE EUROPEAN COMMISSION.

Disturbing situation

The overall occupational safety situation in China is disturbing. In 2010 there were 363,000 work-related accidents, of which 79,000 were fatal. China is also having little success in bringing down the rate of absence due to workplace incidents. High-risk industries in particular are facing formidable occupational safety challenges. Some prime examples are mining, chemicals and fireworks.

Europe and China compared

We established a four-year programme to help China implement safer occupational standards and methods. Our focus is on the high-risk industries. In the first programme component we are analysing the European systems and identifying the salient differences between Europe and China. Our comparison includes official policy and institutions, accident recording systems and rules concerned with workplace accident victims. The information on the European systems will be used by the Chinese government to bring about improvements in their policies.

安全

Train-the-trainer programme

The second programme component is a train-the-trainer programme in which experienced trainers show their Chinese counterparts how to set up training courses in Chinese companies. We are working closely with local parties throughout the programme.

We are posting non-key health and safety experts to Beijing for both programme components to perform studies and give presentations and training courses.

‘HOW CAN WE HELP
CHINA INTRODUCE
SAFER OCCUPATIONAL
STANDARDS AND
METHODS?’

PROJECT Technical Assistance for the EU-China Project on Occupational Health & Safety in High-Risk Sectors

FUNDING European Technical Assistance project

AMENDMENT OF OSH LEGISLATION IN ESTONIA

COUNTRIES APPLYING TO ACCEDE TO THE EUROPEAN UNION IN THE 1990S WERE HEAVILY INVOLVED IN IMPLEMENTING THE 'ACQUIS COMMUNAUTAIRE' IN THEIR NATIONAL LEGISLATIVE SYSTEMS. THE ACQUIS CAN BE DESCRIBED AS THE WHOLE BODY OF EU LEGISLATION AND THE NORMS AND STANDARDS THAT DERIVE FROM IT. THE TRANSITION PERIOD WAS CHARACTERIZED BY THE RELATIVELY RAPID IMPLEMENTATION OF THE WHOLE BODY OF THE ACQUIS. ON PAPER, THE TRANSPOSITION COULD BE DONE RELATIVELY QUICKLY, BUT THE IMPLEMENTATION IN PRACTICE AND COMPLIANCE IN THE FIELD WAS A MUCH GREATER PROBLEM. TNO WAS ENGAGED TO ASSESS, EVALUATE AND, WHERE NECESSARY, SUGGEST UPDATES TO THE ESTONIAN OSH ACT AND IMPROVEMENTS WITH REGARD TO ITS IMPLEMENTATION.

Approach and methodology

TNO completed a research project for the Estonian Ministry of Social Affairs in 2010 and 2011. The objective was to assist the Estonian government with an analysis to assess the body of provisions and practice in force in Estonia on health and safety at work and its compliance with international law, EU directives and practice in other EU member states. Attention was also given to the structure of the entire occupational health and safety infrastructure in Estonia, taking account of the particular characteristics of the Estonian state.

In order to conduct an analysis and make recommendations for modernizing and improving Estonian legislation and its implementation, the approach and methodology comprised the following:

- Gap analysis between Estonian legislation and international and EU legislation.
- Individual interviews and joint meetings with several Estonian stakeholders.
- Selection of EU good practices which could solve shortcomings identified in Estonia.
- A survey among a larger group of stakeholders.
- Desk study and research into Estonian documents.

Research outcome

The overall attitude of the stakeholders is rather critical of the Estonian national OSH policy. TNO recommended restructuring the Estonian OSH legislative framework into a more consistent organization of relevant topics. Moreover, the tripartite dialogue displayed many shortcomings and needed revising and updating. For example, the ‘polluter pays’ principle should be an important element in accident insurance. Consideration was therefore given to a performance-based rating system of contributions that rewards good performance and sanctions poor OSH performance. In addition, user-friendly risk assessment instruments and guidance materials, as available in the EU, should become more readily available. Finally, a national labour inspection enforcement policy should be established and a national policy should be developed regarding the role, scope and function of modern OSH services.

International collaboration

This research was conducted by TNO in close collaboration with the Estonian Center for Applied Research CentAR. Members of the TNO team were Wolfgang von Richthoven (International Consultant on Labour Inspection/Protection, Technical Adviser to IALI, Consultant for the World Bank, former ILO senior specialist), Jan Harmen Kwantes (legal specialist) and Jan Michiel Meeuwsen (senior consultant and team leader).

‘BETTER OSH LEGISLATION IN ESTONIA’

PROJECT Legal analysis for amendment of the Occupational Health and Safety Act in Estonia

PROGRAM European Union, European Social Fund

EXTERNAL OSH SERVICES IN TURKEY

THE DUTCH MINISTRY OF SOCIAL AFFAIRS AND EMPLOYMENT COMMISSIONED TNO TO PERFORM A STUDY ON OSH SERVICES IN TURKEY. TNO WAS FURTHER REQUESTED TO ASSIST THE TURKISH MINISTRY OF LABOUR AND SOCIAL SECURITY WITH STUDY TRIPS TO THREE EU MEMBER STATES TO COMPARE THE OUTCOMES OF THIS STUDY AND THE GAPS IDENTIFIED IN TURKEY WITH THE SITUATION IN THESE THREE MEMBER STATES. BASED ON THIS STUDY AND THE FINDINGS OF THE STUDY VISITS, TURKEY COULD DETERMINE THE BEST WAY TO BRIDGE THESE GAPS AND WOULD BE IN A POSITION TO INTRODUCE CLEAR AND TRANSPARENT REGULATIONS AND POLICIES ON OSH SERVICES, BOTH INTERNALLY AND EXTERNALLY.

Approach and methodology

This study benchmarked Turkish regulations and policies against Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers in the workplace, and the ILO Convention (C-161, 1985) and an earlier Recommendation (R-112, 1959) on occupational health services.

Turkey hopes to accede to the European Union and has ratified this ILO convention, and therefore full compliance with this supranational legislation is of paramount importance.

Documents were studied and numerous Turkish stakeholders interviewed to hear their opinions on the functioning of Turkish OSH services. A stakeholders' meeting was held in Ankara to get critical feedback from the stakeholders on the draft findings of the study. These findings served as input for the study trips to three EU member states.

The Turkish counterpart formed a working group of representatives from the Directorate General of Occupational Health and Safety (DGOHS) of the Ministry of Labour and Social Security and ISGUM, a research institute on OSH under the authority of the ministry.

Project outcome

The following five clear gaps were identified regarding the introduction of OSH services in line with the requirements of EU and ILO regulations and conventions:

1. Not all Turkish workers are covered under OSH legislation - this coverage should be arranged for in future OSH legislation.
2. Not all workers receive health monitoring - health monitoring should be provided for in future OSH legislation.
3. Article 18 in the Turkish 'Regulation on workplace health and safety units and joint health and safety units' does not explicitly mention preventive tasks - preventive tasks should be described more explicitly in this sub regulation.
4. Employee consultation on OSH in accordance with EU legislation is nonexistent in Turkey - the EU Directive on Works Councils should be transposed to Turkish legislation and the Turkish OSH legislation should cover these works councils.
5. The designated worker as prescribed in article 7 of the EU Framework Directive is nonexistent in Turkish OSH legislation - future Turkish OSH legislation should introduce the obligation for employers to designate a worker to assist with legislative compliance.

Impact

All these shortcomings were dealt with in a new OSH Act which was adopted by the Grand National Assembly of Turkey in June 2012. TNO has contributed substantially to important elements of this new Turkish OSH Act.

'IMPROVEMENT OF EXTERNAL OSH SERVICE PROVISION IN TURKEY'

PROJECT Improvement in quality of external occupational health and safety services

PROGRAM MATRA program (MAT 08/TR/9/2), The Netherlands

FERROSH, OCCUPATIONAL HEALTH IN THE TURKISH METAL SECTOR

EMPLOYEES AND EMPLOYERS IN ALL EU MEMBER STATES CAN RELY ON INTERNAL OR EXTERNAL EXPERT ASSISTANCE IN COMPLYING WITH THE PROVISIONS OF THEIR COUNTRIES' RESPECTIVE OSH LEGISLATION. THIS EXPERT ASSISTANCE IS PROVIDED MAINLY BY OCCUPATIONAL PHYSICIANS, SAFETY ENGINEERS AND OTHER EXPERTS, WHO WORK TOGETHER IN OSH SERVICES. FURTHER IMPLEMENTATION OF THE NEW TURKISH OSH ACT IMMEDIATELY RAISES A SIGNIFICANT CAPACITY PROBLEM IN OSH SERVICE PROVISION FOR EMPLOYEES AND EMPLOYERS IN TURKEY. THERE ARE CURRENTLY SIMPLY NOT ENOUGH OCCUPATIONAL PHYSICIANS IN TURKEY. MOREOVER, ALTHOUGH THE NEW OSH ACT HAS ENTERED INTO FORCE, THERE IS A CONSIDERABLE LACK OF AWARENESS REGARDING THE ACT'S PROVISIONS AND ENSUING CONSEQUENCES.

TNO working with Turkish partners

FERROSH (Facilitating Effective and Reliable Resources for Occupational Safety and Health in the Turkish metal sector) is a project TNO designed for MESS, the most representative employers' organization for the metal industry in Turkey. TNO is conducting this project in Turkey together with the Turkish Metal Workers' Union (Türk Metal Sendikası) and the Public Health Institution of Turkey.

The project is largely funded by the Netherlands Embassy to Turkey.

Policy background

The new Turkish Act on Occupational Safety and Health (OSH) was adopted by the Grand National Assembly in Ankara in June 2012. This Act means that a first giant step has been taken towards bringing Turkey's current legislation on safety and health at work in line with requirements from ILO conventions and EU directives in the field. Moreover, based on the new OSH Act Nr. 6331, employers, all workplaces and sectors, irrespective of the number of workers, are now fully covered and required to make use of either internal or external OSH expert support. This immediately raises new challenges as regards the further implementation of the Act's provisions, such as employers' and employees' need to receive assistance and expert support in assessing and improving their working conditions and to learn what their new obligations and rights are according to the new OSH Act and bylaws. This expert support could easily be provided by Community Health Centres (presently approximately 800 centres throughout Turkey) affiliated to the Public Health Institution of Turkey (PHIT) under the jurisdiction of the Ministry of Health in Ankara.

Project objectives

FERROSH intends to:

- Raise awareness of preventive OSH company policies, risk assessment, occupational health risks and the provisions of the new Turkish Act on Occupational Safety and Health among social partners in the metal sector in Turkey and health professionals within the Community Health Centres who have already started servicing metal industries in their town or region.
- Develop and implement five 5-day training seminars for Community Health Centres' service providers, employee representatives and employers in the metal sector to upgrade their skills in and knowledge of occupational health.
- Come to an agreement on how sustainable collaboration between metal industries and Community Health Centres can take place in a network structure, preferably through the web, to strengthen future collaboration between OSH service providers and clients.
- Disseminate this practice and related materials and findings for use by other sectors in Turkey.

Sustainability

This approach can be applied to other industry sectors, and to the public sector, in Turkey, to facilitate the smooth implementation of the provisions of the new Turkish Act on Occupational Safety and Health. Some 150 professionals have been trained in the metal sector, and 10 trainers are available to replicate this approach in the metal sector if needed in other cities and regions in Turkey.

'OCCUPATIONAL HEALTH IMPROVEMENT IN THE TURKISH METAL SECTOR'

PROJECT Facilitating Effective and Reliable Resources for Occupational Safety and Health in the Turkish metal sector (FERROSH)

PROGRAM MATRA, Embassy of the Kingdom of The Netherlands, Ankara, Turkey

SAFER WORKING THANKS TO INFORMATION ABOUT HAZARDOUS SUBSTANCES

› EVERY YEAR SOME 17,000 PEOPLE IN THE NETHERLANDS ARE AFFECTED BY AN OCCUPATIONAL ILLNESS AFTER WORKING WITH HAZARDOUS SUBSTANCES. APPROXIMATELY 1,900 PEOPLE EVEN DIE AS A RESULT. INDUSTRY IS STILL INSUFFICIENTLY AWARE OF THE RISKS OF EXPOSURE AND TENDS TO BE CONFUSED ABOUT HOW TO PUT THE COMPLEX REGULATIONS INTO PRACTICE. THIS SITUATION PROMPTED TNO, ARBO UNIE AND BECO TO DEVELOP STOFFEN-MANAGER®, A FREE DIGITAL INSTRUMENT TO HELP COMPANIES DRAW UP A RISK INVENTORY AND EVALUATION.

Tool for SMEs

Stoffenmanager® is a tool for SMEs that work with hazardous substances but have no extensive knowledge of the subject in house. www.stoffenmanager.nl provides them with information about the health risks of chemical substances in their operations. The focus of the system is on professionals who are involved in substances policy, such as staff with responsibility for quality, working conditions and the environment, and prevention officers.

Low threshold

Stoffenmanager® has a low threshold: a user simply logs in and is able to use the tool straight away. Users can estimate the risk involved in work situations and calculate the degree of exposure, in accordance with standards including the European Union regulatory system REACH. Users then have a clear picture of the scale of exposure on the basis of which they can draw up a plan with risk-reducing preventive measures for their company. They will also be informed about any alternative substances and quick-reference cards are available with instructions for the workplace. What we say is: you can do it yourself!

› International success

Stoffenmanager development started in 2003, since then regular updates have kept the tool in line with the latest legislation and other developments. The current version is 5.0. Interest in the tool is growing in the Netherlands and internationally and there are now around 17,000 registered users. Alongside Dutch, there are English, German and Finnish versions, and other European countries have expressed an interest. The online community has an active LinkedIn group. Users are supported by a help desk, training courses and network events. There is also a Stoffenmanager App.

‘STOFFENMANAGER
HELPS COMPANIES
UNDERSTAND THE
HEALTH RISKS OF
CHEMICAL SUBSTANCES
IN THEIR OPERATIONS.’

PROJECT Stoffenmanager: safe working practices with hazardous substances
RESEARCH PROGRAMME The Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl)

ACTIVELY SUPPORTING SAFER WORKING PRACTICES

STOFFENMANAGER® (WWW.STOFFENMANAGER.NL) PROVIDES A WEALTH OF INFORMATION AND TOOLS TO COMPANIES WHOSE WORK INVOLVES HAZARDOUS SUBSTANCES. TNO, ARBO UNIE AND BECO ARE COLLABORATING IN THE 'STOFFENMANAGER IMPLEMENTATION WORKSHOP' PROJECT TO HELP THESE COMPANIES GET UP TO SPEED WITH STOFFENMANAGER®, AND TO SET UP THEIR OWN HAZARDOUS SUBSTANCES POLICY. THE PROJECT IS FUNDED BY THE NETHERLANDS ORGANISATION FOR HEALTH RESEARCH AND DEVELOPMENT (ZONMW).

Stoffenmanager® in practice

Stoffenmanager® is an online tool that gives rapid answers about the health risks associated with certain substances and products in the workplace. Users can make reliable estimates of harmful substance exposure through inhalation and skin contact. Stoffenmanager's success is confirmed by Inspectorate SZW approval and a registered user base of over 17,000.

Actively supporting hazardous substances policy

Safe working practices with hazardous substances receive less attention than they deserve in the debate on sustainable employment. The urgent need for as many companies as possible to translate information from Stoffenmanager® into systematic substances policy has prompted TNO to initiate the 'Stoffenmanager implementation workshop' project. Our partners are Arbo Unie and Beco, as well as the Dutch Federation of Rubber and Plastics Industry and the Dutch Association of the Paint and Printing Ink Industry. This project supports



LOCATION: Oerlemans Plastics BV

'SAFE WORKING PRACTICES WITH HAZARDOUS SUBSTANCES RECEIVE LESS ATTENTION THAN THEY DESERVE IN THE DEBATE ON SUSTAINABLE EMPLOYMENT.'

45 participating companies at no charge for one year, helping them to implement Stoffenmanager® as part of an effective harmful substances policy. We have defined seven steps for monitoring the participating companies' implementation progress. The aim is for each company to have moved at least one step forward by the end of the project.

Step by step to safer working

The 'Stoffenmanager implementation workshop' provides companies with training and practical experience sessions that encourage a two-way flow of information with other companies and experts. Each participant is also assigned an expert to assist with Stoffenmanager implementation and in creating an effective substances policy in their own company. A free helpdesk is also available. In time the project will help identify the success and failure factors, or, in other words, the measures that work well, and those that don't. In due course we will be able to use the knowledge gained in hazardous substances policy across a wide variety of industries and companies.

**arbo
unie** aan de slag

beco

Member of

ERNST & YOUNG
Quality In Everything We Do

 **ZonMw**

PROJECT Prevention of burden of disease and loss of workers through exposure to hazardous substances in the paint, plastics and rubber industry. Stoffenmanager implementation and capacity building.

FUNDING Netherlands Organisation for Health Research and Development (ZonMW)

GETTING TO GRIPS WITH NANOMATERIALS

› NANOTECHNOLOGY WILL PRESENT NEW OPPORTUNITIES FOR IMPROVING THE QUALITY OF OUR LIVES. IT HAS THE POTENTIAL TO PRODUCE MATERIALS THAT ARE STRONGER, LIGHTER, AND HAVE NOVEL PROPERTIES. NONETHELESS, SAFETY IS VITAL IN THE APPROACH TO NANOTECHNOLOGY. NANOCENTRE HELPS COMPANIES INNOVATE SAFELY USING NANOMATERIALS.

Answering questions about safety

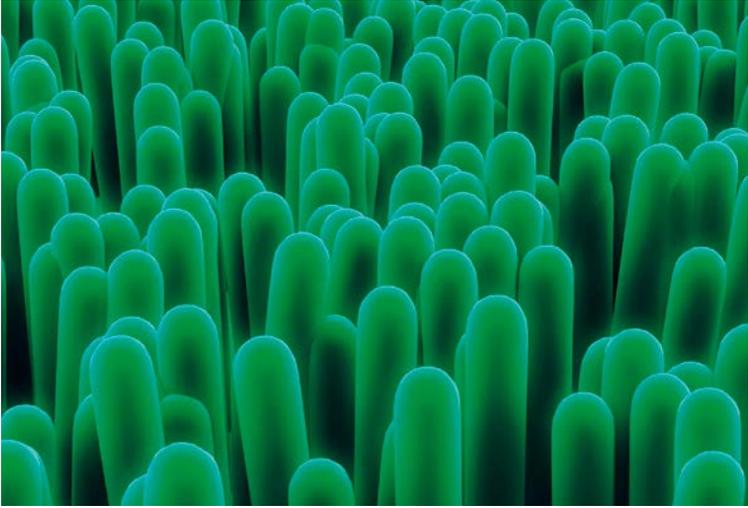
Nanocentre answers questions from industry about nanomaterial safety. It acquaints companies with the wealth of available information and provides a platform for exchanging ideas and experience between industry, knowledge institutes and public authorities. What if the site doesn't have the answer? Then companies are able to ask specific questions directly by phone or e-mail.

Quickscan clarifies nanomaterial use

Companies frequently encounter gaps in their knowledge about nanomaterials and may even be unable to say whether they already work with them. The simple quickscan on www.nanocentre.nl helps them find the answer. The quickscan rapidly tells companies whether they work with or their employees are exposed to nanomaterials, and identifies any necessary workplace safety measures.

Information source, workshops and more

Nanocentre was founded by TNO together with Syntens and the Dutch National Institute for Public Health and the Environment (RIVM), and combines two earlier initiatives. Research revealed a need among SMEs for a source of information in this field. In 2011 TNO had also set up a network of companies that work with nanomaterials, in order to promote the exchange of knowledge. Nanocentre combines the source of information and the network. We intend to expand Nanocentre's activities with workshops to satisfy the demand from industry.



‘NANOCENTRE IS A
CENTRAL SOURCE
OF ANSWERS TO
QUESTIONS FROM
INDUSTRY ABOUT
NANOMATERIAL SAFETY.’

PROJECT Nanocentre

RESEARCH PROGRAMME TNO Central government grant for Work and Health, the Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl)

IMOSHION: HEALTH AND SAFETY FOR SMEs

FOR MANY SMEs, OCCUPATIONAL SAFETY AND HEALTH (OSH) IS STILL FAR FROM THE TOP OF THEIR LIST OF PRIORITIES. DESPITE STRICTLY ENFORCED LEGISLATION, THE REALITY OF TIME, MONEY AND STAFF CONSTRAINTS LEAVES FEW RESOURCES FOR HEALTH AND SAFETY IMPROVEMENTS. TNO'S IMOSHION PROJECT IS DEVELOPING UP-TO-DATE AND USER-FRIENDLY TOOLS TO STEER EUROPEAN SMEs THROUGH THE COMPLEXITIES OF OSH LEGISLATION AND AVOID COMPLIANCE ISSUES.

Integrating OSH into the everyday workflow

The aim of the IMOSHION project is to develop new methods for SMEs to integrate OSH effectively into their everyday workflow. We are working with SME associations to identify their members' technological requirements. We want to find out what kind of OSH tools they need. The tools we have in mind will be practical instruments tailored to SMEs in the manufacturing sector.

Workplace simulator

One of the tools we are developing will help SMEs make better use of the OSH knowledge that is available. We are also building a workplace simulator to allow experimentation and training on OSH issues. In addition, there are training tools for OSH procedures and a working environment design tool to support OSH preventive measures.

Fewer health and safety incidents

The SME associations in the manufacturing sector that are working closely with us in this project are helping with tool validation, supporting the training courses and disseminating the project output to their members. This approach is producing practical instruments for SMEs that simplify compliance with European and national OSH legislation. The IMOSHION tools will help reduce the number of health and safety incidents, leading in time to more competitive European SMEs.



‘PRACTICAL INSTRUMENTS THAT SIMPLIFY COMPLIANCE WITH EUROPEAN AND NATIONAL OSH LEGISLATION!’

PROJECT Improving Occupational Safety and Health in European SMEs
RESEARCH PROGRAMME EU, TNO Central government grant for Work
and Health

SAFER WORK PRACTICES FOR LOW-SKILLED WORKERS

› 30 PER CENT OF THE DUTCH WORKING POPULATION PERFORMS LOW-SKILLED WORK, MUCH OF WHICH IS HIGH-RISK. TRADITIONAL WORKPLACE SAFETY-ENHANCING MEASURES AND INSTRUCTION PROGRAMMES APPEAR TO BE LESS EFFECTIVE WITH THIS GROUP. TNO INVESTIGATED AN ALTERNATIVE APPROACH.

Distinctive approach

Improving safety for low-skilled workers demands a distinctive approach. Methods that resemble school, for example, are often less effective. It is necessary instead to have more visual input and a greater emphasis on practical interaction. The managers of low-skilled workers also tend to be strong on technical knowledge, but lack training in management skills. Accordingly, it is also necessary to address the issue of open communication in the workplace, which is another way for workers to learn how to perform heavy and hazardous work safely and above all how to discuss any impediments openly.

Do's and don'ts

Which approaches do and do not work? To make matters clear, TNO drew up a list of do's and don'ts that an employer can use in reviewing the appropriateness of existing safety programmes for low-skilled workers. We also collaborated with industry to produce five specific, low-threshold micro tools for this target group. The micro tools help in specific situations, such as when challenging workers about unsafe actions or obtaining their commitment to safe working practices. TNO developed the tools with the serious gaming company Salsaparilla and the communication agency Arboriginals.





Micro tools for practice

Companies can use the tools we developed to improve the match between their current safety activities and the low-skilled target group. They have been tested for effectiveness in practical situations and are already being applied in the industrial cleaning and roofing industries. We have brought the tools to the attention of trade associations and intermediary organizations, which can then pass the information on to their networks of companies.

**‘COMPANIES CAN
USE THE TOOLS TO
IMPROVE THE MATCH
BETWEEN THEIR
CURRENT SAFETY
ACTIVITIES AND
LOW-SKILLED WORKERS.’**

PROJECT Low-threshold tools with a macro impact for safe conduct in the workplace

RESEARCH PROGRAMME TNO Central government grant for Work and Health

TNO HELPS DAF TRUCKS STRENGTHEN ITS SAFETY CULTURE

DAF TRUCKS N.V. IS A LEADING MANUFACTURER OF MEDIUM-SIZED AND HEAVY COMMERCIAL VEHICLES. SAFE WORKING IS OF UTMOST IMPORTANCE IN DEVELOPMENT, PRODUCTION, MARKETING, SALES AND SERVICE. THE PROGRAMME 'I MAKE A DIFFERENCE' WAS INTRODUCED IN 2010 TO PROMOTE A PREVENTIVE SAFETY CULTURE. TNO, THE BELGIAN INSTITUTE PREVENT AND GAME COMPANY SALSAPARILLA SET TO WORK ON SAFETY AWARENESS AND THE TRAINING OF MANAGERS AND OFFICE STAFF IN DAF'S PLANTS, WITH A VIEW TO FIRMLY EMBEDDING SAFETY IN ALL BUSINESS PROCESSES. DAF EMPLOYEES' NEW, MORE ALERT, APPROACH TO SAFETY IS EVIDENT IN CONSPICUOUSLY LOWER ACCIDENT FIGURES.

Varied approach

A stronger safety culture calls for a varied approach. Interactive sessions with the Board and training courses for management and supervisors have made safety an integral part of all decisions and changes. A code of conduct clearly shapes DAF's preventive safety culture. Safety is now more visible thanks to a communication campaign, and each department has an action plan with agreements about coaching and commitment, toolboxes, and methods to generate positive attention for this vital subject. The entire project was coordinated by DAF Health & Safety Department.

Less confrontational

A change of safety culture demands considerable patience. DAF is 'driven by quality', as can be seen everywhere you look. DAF understands that inspection alone is no guarantee of quality and that there is no substitute for effective process control. Likewise, the clear message in 'I make a difference' is that safety does not arise from procedures and checks, but from motivated people. This is why the 'Challenging





unsafe behaviour' workshops for managers were such an important part of this project. When someone is now challenged about their unsafe behaviour, the approach is not as a 'policeman', but as a concerned colleague: 'It gives me nightmares when I see you doing that.'

What now?

The next step is to assess how the style of working at DAF has changed, and how well-embedded safety awareness really is. This will involve more than just looking at accident statistics, so the safety culture baseline measurement performed at the start of programme is set to be repeated. Another obvious aim is ensure that continuous development of safety awareness is inherent to the new way of working. It must be captured in DAF's working methods, procedures and management systems, and safety must always be on the agenda of all relevant meetings at DAF. In the end thinking carefully about safe working and being alert at all times to possible improvements must become second nature to all concerned.

**'DAF TRUCKS
ACHIEVES
EVEN BETTER
RESULTS WITH
A STRONGER
SAFETY CULTURE.'**



A **PACCAR** COMPANY

PROJECT Strengthening the safety culture at DAF Trucks

FUNDING DAF Trucks N.V.

REDUCING PHYSICAL WORKLOAD

A HIGH PHYSICAL WORKLOAD CAN LEAD TO MUSCULOSKELETAL SYMPTOMS, ESPECIALLY OF THE MUSCLES, TENDONS AND JOINTS. THIS SITUATION CREATES PROBLEMS FOR THE EMPLOYEE AND EMPLOYER ALIKE. IT IS NOT ONLY HEAVY TASKS, SUCH AS LIFTING AND PUSHING, THAT CAUSE A HIGH PHYSICAL WORKLOAD, BUT STRENUOUS WORKING POSTURES AND REPETITIVE MOVEMENTS ARE ALSO IMPLICATED. TNO PROVIDES EMPLOYERS WITH INSTRUMENTS TO HELP THEM UNDERSTAND AND ADDRESS THE RISKS OF PHYSICAL WORKLOAD IN THE WORKPLACE.

Tools show employers the way

The website www.fysiekebelastingbeoordelen.tno.nl/en/ has three web-based tools for employers:

- The Physical Load Checklist for a quick screening of physical load risk factors, with any necessary recommendations for instruments if a more detailed analysis is required.
- The Hand/Arm Risk Assessment Method (HARM) allows employers to assess the risks of arm, neck and shoulder symptoms with hand/arm tasks.
- The Working Posture Risk Assessment tool (WRAP) indicates if workers' postures induce an increased risk of musculoskeletal symptoms.

Ministry of Social Affairs and Employment:

'These are important tools for companies that help detect risks and support the choice of preventive measures.'

What are the risks of a high physical workload?

The assessment tools show employers the risks associated with physical workload and presents tips for risk reduction based on the results. Employers are then able to take appropriate measures, prevent musculoskeletal symptoms and contribute to the sustainable healthy and productive employment of their workers.

Employers take responsibility

The aim of the digital tools is to encourage employers to take responsibility and provide them with additional support. The initial users have expressed satisfaction, and tests with the tools have shown that they are meeting an important need. Inspectorate SZW also uses the tools in company inspections.



**‘THE TOOLS SHOW
EMPLOYERS THE
WAY TO PREVENT
MUSCULOSKELETAL
SYMPTOMS.’**

PROJECT Digital instruments for physical workload

RESEARCH PROGRAMME The Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl)

BLOCK PAVING - HOW DEMANDING IS THE PHYSICAL WORKLOAD?

SMALL ELEMENT PAVING IS PHYSICALLY DEMANDING WORK, AS LARGE QUANTITIES OF RELATIVELY HEAVY MATERIALS MUST BE PLACED ON A SAND BED ONE AT A TIME. THE WORKERS WHO DO THIS KIND OF WORK ARE CONSTANTLY BENDING, KNEELING AND PERFORMING REPETITIVE ACTIONS AS THEY LIFT AND MOVE THE MATERIALS. MECHANICAL DEVICES AND MACHINES THAT HAVE COME ONTO THE MARKET IN RECENT DECADES HELP REDUCE THE PHYSICAL WORKLOAD, BUT HOW EFFECTIVE ARE THEY?

Investigating working methods

TNO was requested by the Kenniscentrum Bestratingen to compare the physical workload of several working methods. We compared manual paving with various mechanical methods that rely on mechanical clamps or vacuum units, with the use of formatting machines and pallet loading machines. We used special sensor suits to continuously record the work posture of several paving teams. Ergonomists also observed the work posture and activities. All the data were analysed and assessed in a TNO expert session.

Kenniscentrum Bestratingen:
'TNO used the 'traffic light model' to translate research output into practical solutions, which is a distinctive feature of the final report.'

Mechanization less effective than expected

The research revealed that the use of mechanical devices and machines does not automatically lead to a significant reduction of the physical workload. Regardless of the mechanical devices used, the physical workload was always high for at least one member of the team. The differences that do exist in the nature and degree of the physical workload are strongly influenced by choices made by individuals and the team, such as in the working style and in how the work is allocated and organized.



The working method is still an important factor

Besides the use of mechanical devices, other specific recommendations in the research report for improving working conditions include attention to work posture, style of working, work organization and duration.

Training and instruction, backed up by supervision and feedback from subcontractors and fellow workers, are enough to make substantial improvements.

‘REGARDLESS OF THE MECHANICAL DEVICES USED, THE PHYSICAL WORKLOAD WAS ALWAYS HIGH FOR AT LEAST ONE MEMBER OF THE TEAM.’

PROJECT Physical workload of manual and mechanical brick paving
FUNDING Kenniscentrum Bestratingen, Harderwijk

SAFE USE OF NANOMATERIALS

NANOMATERIALS HAVE MANY USES ACROSS A BROAD SPECTRUM OF INDUSTRIES: SUCH AS COATINGS, AUTOMOTIVE, CARE PRODUCTS, FOOD AND PHARMACEUTICALS. THE TECHNOLOGICAL AND ECONOMIC POTENTIAL IS ENORMOUS. HOWEVER, AS NANOMATERIAL APPLICATIONS BECOME MORE COMMON, THERE IS A PRESSING NEED FOR A CLEARER UNDERSTANDING OF THE RISKS INVOLVED. THIS KNOWLEDGE IS VITAL TO ENSURE SUSTAINABLE PRODUCT DEVELOPMENT AND SAFE USE OF NANOMATERIALS. TNO AND ITS RESEARCH PARTNERS ARE MAPPING OUT THE HEALTH RISKS OF NANOMATERIALS IN THE NANONEXTNL PROGRAMME.

The growth in the use of nanomaterials

Due to the increase and the diversity of manufactured nanoparticles, there is a correspondingly greater probability of worker and consumer exposure to nanomaterials. Some thousands of workers in the Netherlands now come into contact with nanomaterials during production or use, and the number is rising fast. The population at large is also being increasingly exposed to the nanomaterials that are used in a wide range of products.

How safe are nanomaterials?

Nanomaterials include nanoparticles, nanofibres and nanocoatings. At present there are too many information gaps about the exposure to nanoparticles and fibres and the toxic effects to determine the risks of all these materials. One aim of the research programme is to devise a new methodology for clarifying the risks of nanomaterials for workers and consumers. The emphasis will be on poorly water-soluble and poorly degradable nanoparticles, which we expect to be the most relevant from a toxicological perspective.

A participant in a TNO and NanoNextNL workshop comments:

'Generally accepted methods for determining the risks of nanomaterials are essential to gain maximum benefit from the new opportunities.'

'EVER MORE WORKERS AND CONSUMERS ARE BEING EXPOSED TO A GROWING NUMBER OF NANOMATERIALS.'

Risk assessment

In this research programme we are developing new methods of determining toxicity and building a risk assessment database that will allow rapid differentiation between high and low toxicity nanoparticles and nanofibres. We are also devising predictive models for the determination of exposure to nanoparticles and nanofibres in the workplace in various sectors, such as the construction and coating industries. Our knowledge about toxicity will help us to estimate the health risks for workers and consumers. Up-to-date information about the programme can be found on www.nanonextnl.nl.



PROJECT NanoNextNL: human health risks

FUNDING NL Agency, TNO Central government grant for Work and Health

BALANCING THE ENVIRONMENTAL AND HEALTH IMPACTS OF NANOPRODUCTS

› FEWER HOSPITAL INFECTIONS WITH A NANOSILVER COATING ON DOOR HANDLES AND TROLLEYS. THIS IS BUT ONE OF COUNTLESS POSSIBLE APPLICATIONS OF NEW NANOMATERIALS. DESPITE THE MANY OBVIOUS BENEFITS TO USING THESE MATERIALS IN PRODUCTS, THEIR INTRODUCTION IS BEING HAMPERED BY THE UNCERTAINTY SURROUNDING THEIR ENVIRONMENTAL AND SAFETY RISKS.

Life-cycle approach including risks

TNO, its research partners, SMEs and associations are collaborating on LICARA, an EU research project to develop a structured life-cycle approach for nanomaterials, which will clarify the full range of the available data on environmental and health effects of nanoproducts, from raw material extraction to waste management and recycling. It will then be simpler to balance the environmental and health risks of nanomaterials with their benefits, even when the information available is scarce. It will also be possible to compare the risks and benefits of nanoproducts with those of conventional counterparts.

Comparing nanoproducts with conventional products

The four products chosen as case studies are an important aspect of the research. We are performing a life-cycle assessment (LCA) and a risk assessment (RA) for each of these products, comparing and contrasting the nanoproduct with a conventional counterpart. One of the case studies is the application of a nanocoating to hospital door handles and trolleys to prevent bacterial infection. We are comparing the LCA (the 'environmental score') and the health risk of the two products. We are also assessing the indirect impact of nanoproduct application: what economic benefit will fewer infections bring?

Researchers focus on SMEs

The focus of the research is on nanomaterial applications in small and medium-sized enterprises (SMEs). Nanomaterials are an excellent match with SMEs because of the high added value and small production volumes involved. SME and trade association forecasts show that LICARA will yield higher SME revenues. The acceptance of nanomaterials will be smoother with the provision of objective information about the related risks and benefits.



‘BALANCING THE ENVIRONMENTAL AND HEALTH RISKS OF NANOMATERIALS AGAINST THEIR BENEFITS.’

PROJECT LICARA

FUNDING EU, TNO Central government grant for Work and Health

› SIMPLE AND RELIABLE CHEMICAL EXPOSURE ASSESSMENT

› IN MEETING THEIR LEGAL OBLIGATION TO EVALUATE THE HUMAN HEALTH RISKS OF CHEMICALS, COMPANIES FIND THEMSELVES CONFRONTED WITH A BEWILDERING AND CONSTANTLY GROWING ARRAY OF CHEMICALS. HOW CAN THEY HANDLE THIS WORKLOAD IN A COST-EFFECTIVE WAY? TNO DEVELOPED THE ADVANCED REACH TOOL (ART) TO HELP THEM DO JUST THIS. ART IS A MODEL THAT REALISTICALLY ESTIMATES EXPOSURE TO HAZARDOUS SUBSTANCES IN THE WORKPLACE.

The European Union regulates chemicals policy

The European Directive concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) imposes obligations on companies' chemicals policy. REACH specifies a tiered approach to the assessment of human exposure. Various user-friendly tools already exist to help with the first tier. However, there is a need for a more reliable and more realistic exposure assessment method for the second tier, in view of the extreme cost in financial and time terms of simply assessing every substance of concern separately.

ART: an efficient alternative

The Advanced REACH Tool gives companies a more efficient alternative for assessing exposure to chemicals in tier two. ART is a widely accepted and reliable model that assesses worker inhalation exposure rapidly and simply. The major collaborative project that TNO set up to develop ART brings together leading scientists from across Europe in the occupational health field.

Model and database

In addition to providing an inhalation exposure assessment model, ART also incorporates an exposure database, enabling information from the model and the database to be combined using sophisticated statistical techniques. The result is more reliable exposure estimates and reduced uncertainty. Assessors are also able to input their own data to update and refine their assessment. ART is available free of charge on www.advancedreachtool.com.

› 'THE ADVANCED REACH TOOL GIVES INDUSTRY AN EFFICIENT ALTERNATIVE FOR ASSESSING EXPOSURE TO CHEMICALS.'

PROJECT Development of the Advanced REACH Tool (ART)

FUNDING The Health and Safety Executive of Great Britain, the Dutch government, AFSSET, Cefic LRI, Shell, Eurometaux, the British Occupational Hygiene Society (BOHS) and GlaxoSmithKline

SAFER HANDLING OF PLANT PROTECTION PRODUCTS

THE ACCEPTANCE OF NEW PLANT PROTECTION PRODUCTS ON THE EUROPEAN AND DUTCH MARKETS IS BASED ON EVIDENCE OF PRODUCT SAFETY. WHAT ARE THE RISKS FOR PEOPLE WHO USE OR COME INTO CONTACT WITH THESE PRODUCTS? THE ANSWER COMES FROM MODEL-BASED RISK ASSESSMENTS. HOWEVER, THE SUBOPTIMUM PERFORMANCE OF EXISTING MODELS HAS PROMPTED TNO, AS PART OF THE EUROPEAN BROWSE PROJECT, TO SEEK BETTER AND MORE ACCURATE ESTIMATING TOOLS.

Why do we need better models?

The existing models for assessing plant protection product risks have several drawbacks. Some models still in use are based on outdated exposure data, and ignore new application techniques (such as the latest spraying devices and advanced computer control) and risks to bystanders and local residents. The models being developed in BROWSE will eliminate these weaknesses, take EU regulations into account, and contribute to the implementation of regulations and directives for plant protection products.

The pursuit of realistic risk assessment

This project responds to the challenge to develop accurate and reliable models for use by a wide range of users in diverse situations. The first step is to gain a better understanding of the underlying mechanisms and factors of exposure. We also consider the impact of exposure-reducing measures, such as using personal protection devices, or fitting a cab onto a tractor. We also factor in regional differences to ensure that the models can be used anywhere in Europe.

› **Widely applicable models**

When the research is complete at the end of 2013 it will yield models for assessing the degree of exposure to plant protection products for a wide variety of people, including bystanders and local residents as well as operators and other workers (such as fruit pickers), both during and after use. The models will be in the form of a software tool. The latest project information is on www.browseproject.eu.

‘BETTER PROTECTION
FOR EVERYONE,
FROM EVERYDAY USERS
TO BYSTANDERS.’

PROJECT Bystanders, Residents, Operators and WorkerS Exposure models for plant protection products (BROWSE)

RESEARCH PROGRAMME EU, TNO Central government grant for Work and Health





SUSTAINABLE EMPLOYABILITY

**PARTICIPATION AT THE BOTTOM
OF THE LABOUR MARKET**

SUSTAINABLE WORK

**MENTAL HEALTH AND
PSYCHOSOCIAL WORKLOAD**

REINTEGRATION PROFESSIONALS IMPROVE SERVICES TO EMPLOYERS

FOR SOME YEARS REINTEGRATION PROFESSIONALS SUCH AS CLIENT MANAGERS AND REINTEGRATION COACHES HAVE BEEN WORKING ALONGSIDE EMPLOYERS ON REINTEGRATION TRACKS TO STEER BENEFIT RECIPIENTS BACK INTO WORK, BUT THE RESULTS HAVE BEEN DISAPPOINTING. MEDIATION FOR PEOPLE WHO HAVE BECOME REMOTE FROM THE LABOUR MARKET HAS MET WITH INSUFFICIENT SUCCESS. TNO IS HELPING REINTEGRATION PROFESSIONALS IMPROVE PROFESSIONAL STANDARDS AND THE QUALITY OF THEIR SERVICES.

Together with the employer

The focus in this research is on collaboration with employers. National and international studies have demonstrated that people with weak labour market position are hampered in finding work by excessive selection requirements, and employer prejudice. Reintegration coaches and client managers need to find an antidote to any false preconceptions on the part of employers, through frequent contact and by ensuring that they have positive experiences in dealing with potential job candidates. The reintegration professionals success in this aim largely determines the probability of a placement. For instance, intense contact between client manager and employer has been shown to increase the likelihood of successful reintegration. However, reintegration professionals differ in their aptitude to approach employers effectively, and some even doubt that it is their task to do so. This attitude reflects the selection criteria for client managers that were used in the past. Today's situation demands a different competency profile for reintegration professionals and calls for the debate about professional standards to be reopened.

Which measures work?

We are translating the insights from our research into working practice through an implementation plan with guidelines and measures to professionalize services. The next step involves testing to find out which measures really work. This question is being answered by gaining experience with several of our proposed measures in local authority social services and in reintegration companies. We will then be able to evaluate the effect of the implementation plan and adapt the range of training programmes accordingly. This also allows us to provide input for programmes that train reintegration professionals, helping them to modify or augment their material so that participants learn to incorporate the new professionalism.

› 'A TOOLBOX FOR ENHANCING THE PROFESSIONAL STANDARDS OF CLIENT MANAGERS AND REINTEGRATION COACHES.'

Toolbox

Our ultimate aim is a toolbox for enhancing the professional standards of client managers and reintegration coaches. We are working towards this objective together with reintegration professionals and university students and lecturers. By creating a structural link between the research output and education and workforce, we aim to provide a lasting impetus to professional standards in the sector.

PROJECT The relationship between reintegration services and employers

FUNDING Stichting Kennisontwikkeling HBO, Consortium partners: Fontys, USBO (Utrecht University) and professional practitioners

COLLABORATING BETTER ON SOCIAL RETURN

SMEs IN THE INFRASTRUCTURE INDUSTRY EARN 80 PER CENT OF THEIR REVENUE FROM LOCAL AUTHORITY CLIENTS. THERE IS AN INCREASING TENDENCY FOR THESE CLIENTS TO SPECIFY REQUIREMENTS FOR SOCIAL RETURN, WHERE THEY REQUEST CONTRACTORS ALSO TO ENGAGE PEOPLE IN A VULNERABLE LABOUR MARKET POSITION. TNO SHOWS COMPANIES AND LOCAL AUTHORITIES HOW TO OPTIMIZE THEIR COLLABORATION ON SOCIAL PROCUREMENT.

'Inclusive' employment practices

The application of social procurement by Dutch public authorities is consistent with the Europe 2020 strategy for smart, sustainable and inclusive growth. Before SMEs can respond to the demand from local authorities, they need to know about social procurement and inclusive employment practices, which means conducting business in a way that enables people in a vulnerable labour market position to find a fulfilling role in the company. How can employers collaborate optimally with local authorities to employ welfare recipients? What approach should employers choose to ensure that the new employees' contribution to their company is in line with their capacities and that these employees become sustainably employable?

Knowledge transfer project

TNO is keen to help companies respond effectively to the issues surrounding social procurement. We have accordingly carried out a knowledge transfer project together with SMEs, employers' organization MKB-INFRA and local authorities. Participants in workshops and individual work sessions have received tips for avoiding obstacles and advice on good practices. The companies have learned to enter into dialogue with local authorities about social procurement. Local authorities have found dialogue with companies, in connection with specific tenders and otherwise, to be the foundation for effective social procurement.





Positive experience

The experience of all the involved parties has been highly favourable. The participating companies and local authorities have expressed satisfaction with regional collaboration on social tendering and proposed including housing corporations, sheltered workshop companies, employment agencies for welfare recipients and others. Three regional workshops have produced firm agreements on follow-on consultation. TNO has documented the experience gained in the 'Collaborating better on social procurement' report, from which the MKB-INFRA association has produced a brochure to disseminate the knowledge and experience to a wide audience.

**'SOCIAL
PROCUREMENT:
ACTIVELY HELPING
PEOPLE WHO ARE
REMOTE FROM
THE LABOUR MARKET
FIND WORK.'**

PROJECT Collaboration with municipalities for the employability of welfare recipients in companies in the MKB-INFRA association

RESEARCH PROGRAMME TNO Central government grant for Work and Health

OBJECTIVE MEASURE OF INCLUSIVE EMPLOYMENT

THE DUTCH GOVERNMENT BELIEVES THAT PEOPLE WITH A VULNERABLE POSITION ON THE LABOUR MARKET (E.G. THE LONG-TERM UNEMPLOYED, THE DISABLED) SHOULD HAVE THE OPPORTUNITY TO FIND FULL EMPLOYMENT. SUPPORTED EMPLOYMENT SCHEMES THAT OFFER THESE GROUPS A SHELTERED WORKING ENVIRONMENT ARE THEREFORE BEING SCALED BACK AS MUCH AS POSSIBLE. TO BOOST THE LEVEL OF EMPLOYMENT AMONG THESE GROUPS, TNO HAS BEEN WORKING CLOSELY WITH LEADING COMPANIES TO DEVELOP THE INCLUSIVE EMPLOYMENT PERFORMANCE LADDER, KNOWN BY ITS DUTCH ABBREVIATION PSO. THIS TOOL IS DESIGNED TO GENERATE AN OBJECTIVE MEASURE OF A MORE INCLUSIVE APPROACH TO EMPLOYMENT.

Performance ladder

The PSO is designed as a performance ladder: ranging from acknowledgement of companies that have plans to take a more inclusive approach to employment (aspirant status) to recognition for companies that do more than the average in this respect (levels 1 to 3). The ladder measures the extent to which companies themselves offer employment to more vulnerable groups and the extent to which they buy from or outsource work to sheltered workshops or other companies with PSO recognition.

Social return

Companies can apply for PSO recognition themselves, to show that they have made an above average contribution in terms of employing people with a vulnerable position on the labour market. This enables companies to distinguish themselves in the

A quality manager at a security company:

‘We welcome the performance ladder. Taking on people from the target group is one thing, but providing them with effective guidance and forming a long-term, stable working relationship is quite another matter. The PSO certificate means we can prove that we are genuinely investing in this group of employees. And it cuts both ways. Certification is also an attractive commercial proposition: if municipalities start using it as part of their social return policy, it will improve our chances of winning contracts. It’s good for our image and gives us the edge over our competitors!’

**The Director of Start Foundation
(venture philanthropy fund) says:**

‘We have introduced an incentive to encourage SMEs to use the PSO in municipalities where it has already been adopted. In doing so, we hope that SMEs will also be able to benefit from social return. In our view, there are plenty of opportunities for growth.’

field of corporate social responsibility. Recognition of this kind is gaining in importance as an increasing number of organizations putting contracts out to tender expect companies to provide a social return on investment: they want the companies they work with to give something back to society in exchange for a contract.

Certificates and learning network

The first participating companies have already been awarded a certificate; the aim is to certify at least 52 companies a year. TNO has also established a learning network in which municipalities wishing to use the PSO can exchange experiences. The concept has become an even greater focus of attention now that the Dutch government wants to introduce a quota for the number of disabled people at work within an organization. The PSO has the potential to be a useful resource in this respect and may even provide an alternative to the quota. The website www.pso-nederland.nl is also generating a great deal of interest.

**‘A TOOL TO HELP
MORE PEOPLE IN A
VULNERABLE POSITION
ON THE LABOUR MARKET
TO FIND REAL JOBS.’**

PROJECT Inclusive Employment Performance Ladder (PSO)

FUNDING TNO Central government grant for Work and Health, Start Foundation, participating sheltered workshops and SMEs

BETTER CONTROL OF THE REINTEGRATION OF BENEFIT RECIPIENTS

MAKING THE STEP TO PAID WORK CAN BE DAUNTING FOR MANY BENEFIT RECIPIENTS. HOW CAN THEY BE HELPED TO REINTEGRATE AND PARTICIPATE IN THE COMMUNITY? WHICH APPROACH WORKS, AND WHAT ARE THE COSTS? TNO'S NEW OPAL ANALYSIS METHOD GIVES POLICYMAKERS ANSWERS TO THESE QUESTIONS.

From participation ladder to OPAL

There are many ways of classifying benefit recipients according to their degree of participation in the community. Municipalities in the Netherlands, for instance, use what is called the participation ladder, with six rungs from 'isolated living situation' through to 'paid work'. Regular assessments of the degree of participation reveal how people develop, which yields information of great value in defining smarter reintegration policy. OPAL stands for *Transition Opportunities on the Participation Ladder*.

A foundation for better reintegration policy

OPAL is a TNO application that analyses people's degree of participation and estimates the likelihood of an increase or decrease in clients' participation (e.g. moving to a different rung on the participation ladder). We can then forecast the probability of a recipient ultimately being able to leave the social benefit system, or the length of time before a recipient will make the transition from benefits to the job market. This will give the responsible bodies a reliable picture of future trends within their client base.

Important tool for policymakers

The policy information produced by OPAL gives policymakers a clearer picture with which to make well-founded reintegration decisions, which is particularly important when budgets for reintegration are under pressure.

› Policymakers will find the information from OPAL useful for many purposes:

- To shed light on the future costs of social benefits, implementation and processes.
- As a tool to help make well-founded choices within a limited budget;
- To demonstrate the impact of policy and interventions on improved transition opportunities.
- To reveal the costs and benefits of proposed actions.

The method was developed in one region of the Netherlands and is being tested in a different region. Initial experience shows that the tool produces valuable information on policy level.

‘OPAL HELPS
POLICYMAKERS
DEFINE SOUND
REINTEGRATION
POLICY.’

PROJECT Illuminating reintegration with OPAL

RESEARCH PROGRAMME TNO Central government grant for Work and Health

NATIONAL EMPLOYABILITY PLAN: MORE PEOPLE LEAD LONGER, HEALTHIER WORKING LIVES

THE AIM OF THE NATIONAL EMPLOYABILITY PLAN IS TO MOBILIZE EMPLOYERS, MANAGERS AND EMPLOYEES TO TAKE SUSTAINABLE MEASURES FOR LONG-TERM, HEALTHY, ENJOYABLE AND PRODUCTIVE PARTICIPATION IN THE LABOUR PROCESS. EMPLOYERS, MANAGERS AND EMPLOYEES SHARE RESPONSIBILITY FOR THIS, WITH EMPLOYEES TAKING CONTROL OF THEIR OWN CAREER DEVELOPMENT AND EMPLOYERS PROVIDING SUPPORT.

Towards sustainable employability

The National Employability Plan is an initiative of Stichting Kroon op het Werk, TNO and WerkVanNu. We and our partners support companies to improve the sustainable employability of their employees. Companies select their own advisors; we facilitate them and provide them with high-quality advanced instruments and digital portals: the Sustainable Employability Index for employees and the Company Scan for employers.

Bilderberg Hotels, a participating company, responded:

‘The National Employability Plan is producing a step change in the employability and productivity of the Dutch labour force. The initial results have materialized in the past year and the awareness among our employees has increased significantly.’

Learning network

Various companies, two sector organizations and over twenty advisors have already joined the National Employability Plan. It is estimated that in 2013 they will have given support to some 2000 employees through the programme. The National Employability Plan is a learning network in which partners exchange ideas and expertise to work on new interventions and integrated approaches through open innovation. TNO is monitoring the output and the quality of the services.

Digital portal

Employees work on their employability through a digital portal. A dashboard allows them to see at a glance what they can work on next. Employees produce an action plan and are supported by a coach. Companies are able to present their range of interventions on the portal, allowing actions to be initiated in a simple way. In parallel,



employers and their advisors can identify potential improvements within their organizations through their own portal and digital dashboard. The focus throughout is on movement and achieving actual change. The digital instruments help quantify these changes and allow customized rapid intervention in the process.

The Minister of Social Affairs and Employment has praised companies such as the Bilderberg Group for investing successfully in the employability of their employees:

'Your company revolves around your employees. Your company cannot grow on its own. It is your employees who are able to grow, and your company will grow with them. So will the economy.'

'THE PLAN HELPS COMPANIES ACTUALLY IMPLEMENT SUSTAINABLE EMPLOYABILITY FOR THEIR EMPLOYEES.'

PROJECT National Employability Plan

FUNDING TNO Central government grant for Work and Health, Stichting Werkgeversforum Kroon op het Werk and WerkVanNu

SUSTAINABLE EMPLOYABILITY DECIPHERED

› WHAT IS THE STATUS OF SUSTAINABLE EMPLOYABILITY FOR THE DUTCH LABOUR FORCE? WHAT ARE THE DIFFERENCES BETWEEN LOW-SKILLED AND HIGH-SKILLED WORKERS, YOUNGER AND OLDER WORKERS, HEALTHY WORKERS AND WORKERS WITH A WORK-RELATED IMPAIRMENT? AND HOW WELL DO EMPLOYERS IN VARIOUS INDUSTRIES PERFORM IN THIS AREA? TNO IS CLARIFYING THE ISSUE WITH THE SUSTAINABLE EMPLOYABILITY MONITOR.

Sustainable employability as a priority

Sustainable employability is the capacity to participate productively in paid or unpaid work with good health and vitality until retirement age. The government has a natural interest in promoting sustainable employability. The productivity and employability of the Dutch labour force are vital to the economy of today and tomorrow. This research project contributes an instrument to monitor both the sustainable employability of workers and employers' policy in this area.

Sustainable Employability Dashboard

The Sustainable Employability Dashboard gives a detailed picture of the factors that determine sustainable employability, and their specific impact. The figures are derived from the large-scale periodic surveys of employees and employers. We use these figures to compare the sustainable employability profiles of workers from vulnerable groups with other workers and industries.

Sustainable employability profiles differ considerably

How do groups of workers differ in sustainable employability? Low-skilled and older workers and workers with a work-related impairment have substantially less favourable scores on the sustainable employability indicators. On the other hand, the over sixty age group actually appears to be more positive about continuing to work for longer. However, there are few measures in place in most industries and smaller firms to promote later retirement. The sustainable employability profiles give sectors and industries the data they need to promote sustainable employability effectively.



‘THE MONITOR GIVES
SECTORS AND
INDUSTRIES THE
DATA THEY NEED TO
PROMOTE SUSTAINABLE
EMPLOYABILITY
EFFECTIVELY.’

PROJECT Sustainable Employability Monitor: output and method

RESEARCH PROGRAMME The Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl)

HOW CAN PEOPLE REMAIN EMPLOYABLE BEYOND THE AGE OF 45?

HOW CAN WE CHANGE PEOPLE'S WORK ABILITY, MOTIVATION TO WORK, HEALTH AND PRODUCTIVITY BETWEEN 45 AND 64 YEARS OF AGE? HOW DOES WORK AFFECT HEALTH? TNO IS SEEKING ANSWERS TO THESE AND OTHER QUESTIONS ABOUT WORK, WORKING CONDITIONS, SATISFACTION, AND HEALTH IN THE LARGE-SCALE LONGITUDINAL STUDY KNOWN AS STREAM.

Satisfying and healthy continued employment

An important factor in alleviating the effects of the ageing population will be for more older people to carry on working for longer. TNO is investigating how this can be achieved in both a satisfactory and healthy way. With the Study on Transitions in Employment, Ability and Motivation (STREAM) TNO is exploring the circumstances that allow people over the age of 45 to continue in productive paid work for longer and in good health.

Large-scale study

STREAM involves studying people aged between 45 and 64 over a four-year period. Each year the participants complete an online questionnaire about their health, work, employment history, and social situation. The initial baseline that was taken in 2010 included 12,000 employees, 1,000 self-employed people, and 2,000 unemployed people. We augment the data collected annually with qualitative interview studies among some of the participants. The second and third annual questionnaires have now been completed, and the first reports and articles about the findings have been published. Additional information about STREAM and its output can be found on www.tno.nl/stream.

A basis for intervention programmes

STREAM is shedding new light on the circumstances that are conducive to keeping people over the age of 45 in productive paid employment in good health for longer. It has been found that people who are in good health and whose knowledge has not become obsolete can take on more work and are likely to enjoy doing so. Low-skilled and disabled workers have poorer scores on vitality, participate less in training courses, and are less mobile on the labour market. Unemployed people report that employers seem to think they are too old and are reluctant to give them an opportunity to work. The large volume of STREAM output forms a sound basis for the development of intervention programmes.



**Ministry of Social Affairs
and Employment:**

‘There is already one well thought-out document, *Sustainable employability of older people: output of the first STREAM measurement*, with unique results. Besides that, the study’s added value is its longitudinal character. We are looking forward with great interest to what STREAM still has in store.’

‘TNO IS INVESTIGATING HOW OLDER PEOPLE CAN CARRY ON WORKING FOR LONGER WITH SATISFACTION AND IN GOOD HEALTH.’

PROJECT STREAM: how can we keep people over the age of 45 in productive employment for longer and in good health?

RESEARCH PROGRAMME The Joint Programme for Occupational Safety and Health in the Netherlands (JPOSH-nl), TNO Central government grant for Work and Health

SKILLED WORKERS CONTROL THEIR OWN DEVELOPMENT

THE WORK OF TODAY'S SKILLED WORKER IS CHANGING CONSTANTLY WITH THE INTRODUCTION OF NEW TECHNOLOGY, AMONG OTHER REASONS. THE REQUIREMENTS ON SKILLED WORK CHANGE ACCORDINGLY. SKILLED WORKERS ARE OBLIGED TO ANTICIPATE THESE CHANGES IF THEY ARE TO RETAIN THEIR VALUE FOR THEIR EMPLOYER AND THE LABOUR MARKET. TO HELP THEM, TNO HAS DEVELOPED A DIGITAL LEARNING ENVIRONMENT, WHICH WE HAVE CALLED CRAFTSMAN NEW STYLE.

Continuous change

Adapting to change demands effort from both employers and workers. Craftsmen New Style control their own continuous development, keeping themselves attractive for current and future employers alike. But how can we be sure that the workers will actually take control of their development, and enjoy doing so? TNO's 'Craftsman New Style' digital learning environment is a solution.

Learning environment for employees, employers and trainers

The Craftsman New Style learning environment targets three groups of actors: employees, employers and trainers. Craftsman New Style encourages skilled workers to take control of their own learning process and persuades their employers to support them. Trainers also have to provide appropriate training solutions, with courses that focus on workers' and their employers' needs. The digital learning environment offers the three target groups quickscans to clarify any points for improvement and give recommendations for how to work on them.

As a result:

- Employees will know which Craftsman New Style competencies need attention and what to do to improve them.
- Employers will know the potential gain of training solutions and of the support they give workers to enhance their competencies, and the conditions they can create for their workers.
- Trainers will understand how well their training solutions match the required Craftsman New Style competencies and how to arrive at an appropriate programme of development.

One of our project partners says:

'We see the need for a learning and working environment that helps reduce the developmental disadvantage in the large group of skilled workers at the low end and middle of the scale. We recognize the unfortunate truth that training and development cannot be taken for granted for this group.'



Easily accessible solutions

The resulting digital learning platform is an excellent match with the competency profile of the Craftsman New Style: self-directed learning, computer skills, searching the web for information, and building and maintaining a personal network. Skilled workers are given easily accessible solutions for further development, including informal learning.

By providing this innovative learning platform, we are encouraging workers, employers and training programme providers to coordinate demand and supply more effectively. The platform invites workers to adopt a proactive stance, to take control and have a sense of responsibility for their own development.

Another project partner adds:

‘Learning must become a natural part of work. Also for skilled workers. They will then continue to have added value for employers, customers and the labour market. This is why we want every working environment to become a learning environment.’

‘CRAFTSMEN NEW
STYLE CONTROL THEIR
OWN CONTINUOUS
DEVELOPMENT, KEEPING
THEMSELVES ATTRACTIVE
FOR CURRENT AND FUTURE
EMPLOYERS ALIKE.’

PROJECT Learning platform development for Craftsman New Style

FUNDING TNO Central government grant for Work and Health, participating companies

HOW WORKERS KEEP THEIR SKILLS UP-TO-DATE

HOW CAN WE HELP WORKERS PREVENT THEIR SKILLS FROM BECOMING OBSOLETE, AS THEY LOSE THE ABILITY TO PERFORM CERTAIN WORK ROLES THROUGH GRADUAL PHYSICAL DETERIORATION, OR AS THE SKILLS THEY ONCE LEARNED BECOME LESS RELEVANT WITH CHANGES IN WORKING PRACTICES? TNO CARRIED OUT A PILOT SURVEY OF OVER 4,000 WORKERS TO FIND THE ANSWER.

Obsolete skills

Many workers run the risk of skill obsolescence, whether through physical or cognitive wear and tear that undermines their performance at work, or a slow decline in demand for their skills.

The resulting loss of value on the labour market is known as economic skill obsolescence.

What do the workers think?

What are the stages of skill obsolescence and how can the process be mitigated? TNO and TNS Infratest carried out a pilot survey to gain a clear picture of the situation. Some 4,000 workers in the 30 to 55 age range in four European countries completed a web-based survey. On average, 16 per cent of these workers considered their skills to be obsolete, either through advances in technology or structural reorganization. Language proficiency and computer and IT skills were the worst affected.

Cedefop:

'We are more than satisfied with how TNO performed this project. TNO has translated first-rate expertise and knowledge into practical and relevant findings. The data that TNO has provided will be invaluable in Cedefop's analysis of skill trends on the European labour market.'



Job design

The groups found to be at the greatest risk of skill obsolescence are lower-skilled and older workers, and those with no opportunity to develop their own skills in the course of their careers. The study also revealed the importance of job design in putting workers in control of their own learning, career development and acquisition of new skills. The project was performed on behalf of the European Centre for the Development of Vocational Training (Cedefop). The TNO pilot survey will be the basis for Cedefop's follow-up research in all 27 EU member states.

**'ON AVERAGE,
16 PER CENT OF
WORKERS CONSIDER
THEIR SKILLS TO BE
OBSOLETE.'**

PROJECT Pilot survey on skill obsolescence among ageing workers

CLIENT European Centre for the Development of Vocational Training (Cedefop)

WHICH LIFESTYLE PROGRAMMES WORK FOR COMPANIES?

EVER MORE COMPANIES ARE COMING TO VIEW PREVENTION AS THE BEST WAY TO KEEP PEOPLE FIT, AND THEY ARE NOW INVESTING IN THE HEALTH AND VITALITY OF THEIR EMPLOYEES. THEY ARE OPTING FOR THE LONG-TERM PRESERVATION OF PHYSICAL AND MENTAL FITNESS, AND ACCORDINGLY FOR SUSTAINABLE EMPLOYABILITY. UNFORTUNATELY THERE IS STILL TOO LITTLE SCIENTIFIC KNOWLEDGE ABOUT THE FACTORS THAT INFLUENCE SUSTAINABLE EMPLOYABILITY. THE OBJECTIVE OF THE VIP VITALITY PROJECT IS TO GENERATE THIS KIND OF KNOWLEDGE AND TO DEVELOP EFFECTIVE VITALITY PROGRAMMES.

Vitality for companies and employees

The VIP vitality research programme is being carried out by VU University Medical Center and TNO. The programme includes five research subprojects at companies in the Netherlands:

- Subproject 1: promotion of mental health through attention training and e-coaching for the employees at two research institutes.
- Subproject 2: personal coaching oriented to lifestyle factors for overweight construction site workers.
- Subproject 3: relaxation at work through group motivational interviewing and adaptations to the office environment for employees in an administrative organization.
- Subproject 4: a change of culture to boost inspiration and vitality in three organizations.
- Subproject 5: analysis of the cost-effectiveness of interventions in Subprojects 1, 2 and 3.

Result: a clearer picture of what is effective

While there is no shortage of interventions that promise to contribute to employee health, vitality and enthusiasm, very little is known about whether they actually have the desired effect. The objective of VIP is to acquire scientific evidence of the effectiveness of these interventions. This project is unique in that it includes a thorough analysis of the cost-effectiveness of interventions, something that has never been done before.



‘THERE ARE PLENTY
OF INTERVENTIONS
TO IMPROVE PEOPLE'S
VITALITY AND HEALTH,
BUT DO THEY
REALLY WORK?’

PROJECT VIP vitality scheme

FUNDING Delta Lloyd Group / Fonds NutsOhra

STAYING SUSTAINABLY EMPLOYABLE IN THE CONSTRUCTION INDUSTRY

WORK IN THE CONSTRUCTION INDUSTRY IS PHYSICALLY DEMANDING. OLDER CONSTRUCTION WORKERS TEND TO HAVE INCREASING DIFFICULTY IN CONTINUING TO WORK, AND MANY HAVE TO STOP PREMATURELY. HOW CAN WE MAKE SURE THAT CONSTRUCTION WORKERS CAN CARRY ON WORKING FOR LONGER AND WITH PLEASURE? TNO AND VU UNIVERSITY MEDICAL CENTER JOINED WITH CONSTRUCTION WORKERS TO DEVISE THE PROGRAMME KNOWN AS *YOUR HEALTH – UNDER CONSTRUCTION*.

Promoting healthy and enjoyable work

Cooperation between employers and employees is vital in helping construction workers to carry on working in good health. The Your Health – Under Construction programme accordingly provides tools and practical guidance for workers, so that they can take steps of their own to improve their working conditions, reduce fatigue through alternative work break schedules and improve communication on the construction site.

According to the researchers:

‘This is an extremely promising programme that lends itself to a follow-on as Your Health – Under Construction version 2.0!’

Training courses and tools

The three components of the Your Health – Under Construction programme are individual training courses given by a physiotherapist to reduce workload, a work-break tool that provides information about alternative break schedules and an empowerment training course to give workers more direct influence on the construction site.

Less absence through illness

The project included six construction companies and almost three-hundred of their workers, who completed a questionnaire and then workers and subcontractors were interviewed. The findings were linked to absenteeism data from the construction companies. The workers were satisfied with the programme, in particular the training they received from a physiotherapist. While the programme did not demonstrably improve health and work ability, the reduction in absence through illness meant that the intervention saved costs for the employers nonetheless. Indeed, every euro employers invested finally gave a return of 6.4 euros.



‘YOUR HEALTH – UNDER CONSTRUCTION IS HELPING CONSTRUCTION WORKERS TO CARRY ON WORKING FOR LONGER AND WITH PLEASURE.’

PROJECT Your Health – Under Construction (Je Gezondheid in de Steigers): a prevention programme in the construction industry

FUNDING Netherlands Organisation for Health Research and Development (ZonMw), TNO Central government grant for Work and Health, Stichting Arbow

HOW CAN WE STOP WORKERS FROM SLIPPING INTO MENTAL RETIREMENT?

RESEARCH HAS SHOWN THAT AS WE AGE, WE FIND IT HARDER TO GET TO GRIPS WITH NEW TECHNOLOGY, ARE ABSENT FROM WORK MORE OFTEN, STRUGGLE WITH CHANGE AND LOSE MOTIVATION FOR TRAINING AND EDUCATION. THE DRIVE TO PUSH OUR OWN LIMITS DECLINES AS HABIT AND ROUTINE BECOME THE NORM. TNO AND PHILIPS HAVE DISCOVERED HOW TO HELP WORKERS FROM ENTERING THIS STATE OF MENTAL RETIREMENT. WE ARE NOW DEVELOPING AN EFFECTIVE INTERVENTION PROGRAMME CALLED STAYMOBIL TO PUT A STOP TO MENTAL RETIREMENT.

Sustaining older workers' employability

People in organizations are ageing: there are already more people over the age of fifty than thirty-year-olds on the labour market. Because older people will be part of an organization for longer than before, it is vital to make their employability more sustainable. This means encouraging employees to stay actively engaged for the benefit of both the organization and their own future. This is why TNO and Philips are conducting the 'Skills obsolescence and mental retirement' project.

Mental Retirement is measurable and stoppable

In the project we identified causes and effects of mental retirement and how it relates to various forms of skills obsolescence (see page 74). Mental retirement leads to early retirement and appears to be both the cause and effect of experienced skills obsolescence. Our aim now is to further improve our understanding of mental retirement and the underlying mechanism, in order to define specific interventions to delay both the process of mental retirement and skills obsolescence to allow workers to continue to work productively for a longer period, in good health and with meaning, challenge and ambition.

Combating mental retirement: 'Staymobil'

To reach our goals to effectively combat mental retirement, we are, together with Philips, currently developing 'Staymobil', an effective intervention programme that will help put an end to mental retirement and skills obsolescence both on individual and group levels.

The instruments developed in the project help reveal the presence of someone in the organization being 'mentally retired'. We are also improving our understanding and awareness of the issue and achieving a better-informed dialogue, beyond which we are also keeping workers out of a rut and helping them switch more easily from network to network and from old ways to new ways of working.



‘WORKERS WILL BE
LESS LIKELY TO GET
INTO A RUT AND
BETTER ABLE TO
SWITCH FROM OLD
WAYS TO NEW WAYS
OF WORKING.’

PROJECT Skills obsolescence and mental retirement

FUNDING Philips, TNO Central government grant for Work and Health

HEALTHIER RESTRUCTURING WITH PSYRES

ORGANIZATIONAL RESTRUCTURING IS COMMONPLACE NOWADAYS, AS ORGANIZATIONS NEED REPEATEDLY TO ADAPT TO REQUIREMENTS IMPOSED ON THEM FROM OUTSIDE. BUT HOW CAN THEY SAFEGUARD THEIR WORKERS' WELLBEING DURING THE RESTRUCTURING PROCESS AND IN THE NEW SITUATION? IN THE EUROPEAN RESEARCH PROJECT PSYRES, TNO STUDIED THE IMPACT OF RESTRUCTURING ON WORKERS' WELLBEING AND HOW TO MITIGATE THE ADVERSE EFFECTS.

Adverse effects of restructuring

TNO carried out a two-year research project together with European partners. The large-scale study has confirmed the adverse effects of restructuring on workers' mental health and wellbeing. Restructuring can lead to less job security, a higher workload and a poor working atmosphere.

Key aspects for healthy restructuring

Restructuring is not doomed to have an adverse effect. What appears to matter is how the restructuring process is approached. It is important to provide clear communication, for organizations to involve their workers in the process and for managers to be supportive. These factors make a difference between a successful restructuring and one that undermines workers' wellbeing.

International study

TNO carried out this project together with three European research institutes. The PSYRES team analysed several datasets from studies conducted in Finland, Denmark, Poland and the Netherlands. The team also consulted workers and managers with recent experience of restructuring. Together with HR advisers and other experts, the team held workshops to explore strategies to limit the adverse effects of restructuring on wellbeing. One strategy could be to give the restructuring a 'face', such as by having the CEO deliver the announcement in person, rather than just circulating a memo.



‘WHAT CAN WORKERS AND ORGANIZATIONS DO TO COME THROUGH A RESTRUCTURING IN GOOD HEALTH?’

PROJECT Psychological Health and Well-being in Restructuring: key effects and mechanism (PSYRES)

FUNDING EU, TNO Central government grant for Work and Health

GAME GIVES MANAGERS A HANDLE ON MANAGING WORK-RELATED STRESS AND WORK ENGAGEMENT

WORK-RELATED STRESS PRESENTS A MAJOR RISK FOR WORKERS. THERE ARE MEASURES AVAILABLE TO MITIGATE THESE RISKS AND EVEN TO STIMULATE WORK ENGAGEMENT AMONG EMPLOYEES, BUT THEIR EFFECTS ARE NOT ALWAYS IMMEDIATELY VISIBLE. MANAGERS THEN HAVE A TENDENCY TO POSTPONE THESE MEASURES. THAT IS A SHAME BECAUSE ENGAGED WORKERS HAVE MANY ADVANTAGES FOR COMMERCIAL AND NONPROFIT ORGANIZATIONS. ENGAGED WORKERS ARE MORE COMMITTED, LOYAL, ENERGETIC AND PASSIONATE, AND ENJOY MORE PERSONAL GROWTH IN THEIR WORK. THIS LED TNO TOGETHER WITH OTHERS TO DEVELOP A GAME FOR MANAGERS TO GIVE THEM A HANDLE ON MANAGING WORK-RELATED STRESS AND ITS CONSEQUENCES. THE GAME ALSO TEACHES MANAGERS HOW TO CULTIVATE THEIR WORKERS' WORK ENGAGEMENT.

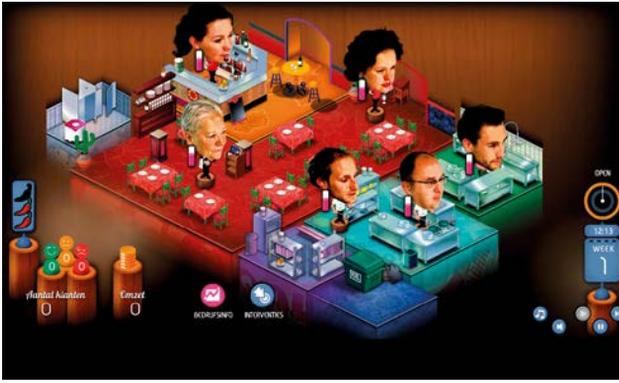
Complex simulation model

The serious game is set in a restaurant. The game is based on a complex simulation model, which was developed based on results from an extensive literature study and on the expertise and practical experience of TNO, ING Bank, and the health and safety service 365. From the choices they make in the game, managers learn about work-related stress, work engagement, the impact of measures, and how they themselves can actually influence the stress and engagement levels of their employees. They learn what to do to reduce work-related stress and keep workers motivated and dedicated to their work.

According to one consultant:
'The game shows how personal factors, workplace factors and organizational processes jointly determine people's work engagement. Players in the game experience for themselves their influence on their co-workers' work engagement and health.'

Immediately visible gains

The online serious game consists of a virtual world in which managers can experiment with different strategies. Feedback on every action is immediate, with a visible result in the virtual workplace. For instance, will the player grant chef Harold's request to go on a Mexican cookery



course? While the chef may well have to invest extra effort and energy in the course, extra learning opportunities also contribute to work engagement.

Learning through experience

The game provides a virtual world where events can actually be experienced. The advantage of the game is that the effects of interventions can be scaled, not only short term, but also medium and long term effects can be shown and experienced during the game, and managers can try different management styles without fearing negative consequences.

After finishing the game, players are confronted with reflection questions which ensure that they translate the situations in the restaurant setting to their own work situation.

‘THE INTERACTIVE
GAME GIVES
IMMEDIATE FEEDBACK
ON A MANAGER’S
VIRTUAL ACTIONS.’

PROJECT Engagement Game

FUNDING ING Bank, 365/ArboNed, TNO Central government grant for Work and Health

REVEALING THE COSTS AND BENEFITS OF ANTI-AGGRESSION POLICY

AGGRESSION IN THE EMERGENCY DEPARTMENT, THREATS AGAINST AMBULANCE CREWS, VERBAL ABUSE OF PUBLIC SERVICE WORKERS: ALL COMMONPLACE EXAMPLES OF THREATENING BEHAVIOUR AGAINST EMPLOYEES SIMPLY DOING THEIR JOB. THIS IS A THREAT TO THEIR SUSTAINABLE EMPLOYABILITY AND REQUIRES EMPLOYERS TO TAKE CORRECTIVE ACTION. TNO HAS DEVELOPED THE SAFE PUBLIC SERVICES CALCULATOR FOR ANALYSING THE COSTS AND BENEFITS OF ANTI-AGGRESSION MEASURES.

Major expense items

Aggression and violence are a source of substantial expense, due to wasted time, absence from work and high employee turnover. But exactly how severe is the damage, and what can the various measures achieve? The Ministry of the Interior and Kingdom Relations requested TNO to investigate the costs and benefits involved.

Practical instrument

Our research findings are presented in a report for the responsible ministries and are incorporated in the Safe Public Services calculator, a practical cost-benefit instrument for employers. The calculator is a tool for working out the annual costs of aggression and violence, and for estimating the social and financial costs and benefits of anti-aggression measures.

General purpose

The calculator helps organizations develop efficient anti-aggression policies and to make well-founded choices, by giving them a clear view of the costs and benefits of various policy measures. The tool has been tested in a number of pilot organizations, and is suitable for all public services and measures. The statistical results can be used in annual reports, business cases and policy documents.

As one user says:

'This is a user-friendly instrument that encourages discussion. The extremely relevant output is ready to be used anywhere.'



‘THE SAFE PUBLIC SERVICES CALCULATOR HELPS ORGANIZATIONS ACHIEVE AN EFFICIENT ANTI-AGGRESSION POLICY.’

PROJECT Aggression Assuaged: Safe Public Services calculator

FUNDING Ministry of the Interior and Kingdom Relations

CLARIFYING THE IMPACT OF WORK STRESS

WHAT ARE THE ADVERSE HEALTH EFFECTS OF A STRESSFUL WORKING ENVIRONMENT? HOW DOES WORK STRESS AFFECT MENTAL HEALTH, CARDIOVASCULAR DISEASE, WORK DISABILITY, HOSPITAL ADMISSIONS AND DEATH RATES, AMONG OTHER ISSUES? TNO IS INVESTIGATING THE IMPACT ON VARIOUS GROUPS OF WORKERS.

What kinds of workers are most vulnerable to stress?

Our research focuses on the impact of workplace psychosocial risk factors for workers in a wide range of groups, including those with low income, ill health and those who exhibit risk-taking behaviour, alongside others with a healthy lifestyle in a favourable work situation. The research findings help identify groups of workers who are vulnerable to the adverse health effects of psychosocial risks in the workplace.

Large-scale international study

The study is a joint undertaking of several EU research institutes. It is a large-scale international study that is providing a clear picture of the impact of psychosocial risk factors for various target groups. It has emerged, for example, that smokers, teetotallers and heavy drinkers have an increased risk of work stress. It has also been shown that both weight gain and weight loss can lead to work stress.

Good practices and interventions

The study findings enable us to specify good practices in the form of representative practical scenarios for mitigating the adverse effects of a stressful working environment. We are also able to estimate the individual and organizational impact of various interventions: which interventions are appropriate for reducing the adverse effects of a working environment where workers are exposed to psychosocial risks? The interventions of interest are those that enhance workers' autonomy or decision-making power. An atmosphere of social support must also be created, with workers lending each other a hand or lightening each other's load.

Many international publications have already reported on the study findings, including The Lancet.

› 'THE AIM IS TO
MITIGATE THE
ADVERSE HEALTH
EFFECTS OF A
STRESSFUL WORKING
ENVIRONMENT.'

PROJECT Work-related psychosocial factors and health in subgroups:
Individual-Participant-Data meta-analysis (Work IPD)

RESEARCH PROGRAMME The Joint Programme for Occupational Safety and
Health in the Netherlands (JPOSH-nl)

HAPPY@WORK: ONLINE SELF-HELP FOR PSYCHOLOGICAL SYMPTOMS

DEPRESSIVE SYMPTOMS ARE COMMON, ALSO AMONG WORKERS. THEY ADVERSELY AFFECT QUALITY OF LIFE AND LEAD TO SICKNESS ABSENCE AND LOWER PRODUCTIVITY AT WORK. THERE IS PLENTY OF SCIENTIFIC EVIDENCE THAT DEPRESSIVE SYMPTOMS CAN BE TREATED SUCCESSFULLY WITH GUIDED SELF-HELP THERAPY. THE HAPPY@WORK PROJECT PROVIDES A GUIDED SELF-HELP THERAPY THAT IS ADAPTED TO WORK SITUATIONS.

Low-threshold therapy

Happy@Work is available on the web, which makes access as simple and convenient as possible. Participants take six modules, each of which involves several assignments, and an online coach gives feedback on the individual assignments. The effect of the therapy is measured through a series of questionnaires prior to the intervention, at the end of the therapy, and at six months and one year later. The cost-efficiency is also determined.

Determining effectiveness

The effectiveness of the self-help module is measured in a control-trial study with an experimental and a control group of workers. The experimental group is offered the web-based Happy@Work, while the control group receives no specific programme.

Positive and preventive effects

The experimental group was very satisfied with the therapy. Initial results show a sharper decline in their depressive symptoms compared with their counterparts in the control group. They also showed lower emotional exhaustion scores, which indicates they have a low risk of developing stress symptoms. Happy@Work would appear to be an effective way of delivering a therapy that works for a large group of workers. The effect is also preventive: the therapy works even before serious symptoms develop.

This is a joint project of the EMGO Institute for Health and Care Research, VU University Amsterdam and TNO.

› ‘DEPRESSIVE
SYMPTOMS
CAN BE TREATED
SUCCESSFULLY
WITH GUIDED
SELF-HELP
THERAPY.’

PROJECT The effectiveness and cost-efficiency of an early-stage guided self-help programme for workers with depressive symptoms

RESEARCH PROGRAMME TNO Central government grant for Work and Health





INNOVATION AND LABOUR PRODUCTIVITY

CARE AND WORK

SOCIAL INNOVATION MANAGEMENT

INNOVATIVE WORK

CARE PROVIDERS IN AMSTERDAM-NOORD ARE WORKING TOGETHER BETTER

› KRIJTMOLEN (CHALK MILL) IS THE NAME OF A PARTNERSHIP OF HEALTHCARE AND WELFARE SERVICE PROVIDERS IN AMSTERDAM-NOORD THAT ARE COLLABORATING CLOSELY TO MAKE THIS URBAN DISTRICT A HEALTHIER PLACE. THEY ARE COORDINATING THEIR EFFORTS TO ACHIEVE THE BEST POSSIBLE MATCH WITH THEIR CLIENTS' NEEDS. THE AIM IS TO AVOID FRAGMENTATION BY PROVIDING INTEGRATED SERVICES.

Better organized healthcare

An elderly woman with various chronic illnesses would hitherto have had to deal with a number of different care providers, including a general practitioner, various specialists and the home care service. An integrated approach makes it possible to combine this care and make it more efficient. The result will be fewer appointments, no unnecessary treatments and more satisfied clients.

Focus on vulnerable groups

The project focuses on vulnerable groups:

- People who are frail and elderly or have dementia.
- Minimum-income households (19.8% of all households in the Amsterdam-North district); a yet unknown part of this population will be eligible for this new approach.
- Households at risk (who are referred by primary healthcare and social care professionals).

These groups are responsible for much of the healthcare and social services spend. In this project we are investigating whether integrated services are a cost-effective solution for these groups.

Valuable knowledge about integrated hospital and community services

Better Together in Amsterdam-Noord is yielding new and valuable knowledge about the success and failure factors of integrated hospital and community services. TNO is also investigating the benefits of integrated services in terms of vulnerable groups' health, wellbeing and participation in the community. We are also developing a funding formula to determine the best way in which to allocate the costs and benefits of integrated services. The partnership in Amsterdam-Noord is a prototype for integrated services in other major cities.



‘HEALTHCARE AND WELFARE SERVICE PROVIDERS OFFER INTEGRATED SERVICES FOR VULNERABLE GROUPS.’

PROJECT Better Together in Amsterdam-Noord: integrated services for minimum-income households

RESEARCH PROGRAMME TNO Central government grant for Work and Health

› GIVING INTEGRATED CARE A HELPING HAND

› AN EXPERIMENT IN THE LEIDEN REGION HAS THE AIM OF APPLYING A 'TRIPLE AIM' APPROACH TO PEOPLE WITH CHRONIC DISEASES. THE TRIPLE AIMS ARE TO IMPROVE PATIENTS' HEALTH, ENHANCE THE PATIENT QUALITY OF LIFE AND REDUCE PER CAPITA HEALTHCARE COST. INTEGRATED CARE, IN WHICH CARE PROVIDERS IN THE HOSPITAL AND PRIMARY CARE WORK TOGETHER, IS A KEY CONCEPT.

Enabling integrated care

While policymakers, health insurers and care institutions are aware of the added value of integrated care, initiatives in this area are few and far between, and slow to materialize. The current funding and pricing rules provide too few incentives for care organizations to integrate their services. And when care providers do propose action, funding often runs up against problems in substantiating the expected gains from integrated care.

Evidence in support of care programmes

The aim with the Rijncoepel experiment is to design and implement integrated care programmes and gather evidence that they improve the health of the population, increase patient quality of life and reduce per capita cost. The four partners in the experiment are Rijncoepel, the Leiden Diaconessenhuis hospital, TNO and the health insurer Zorg en Zekerheid. The project is also developing models to analyse the current status of patient care and services, and to calculate the proceeds of new initiatives.

Better substantiation creates support

Any process of renewal in the healthcare system is accompanied by great uncertainty for all concerned, including general practitioners, specialists and health insurers. Will better care really be delivered? Will costs run out of control, and will income fall too low?

Will costs run out of control, and will income fall too low?

The experiment accordingly involves business cases and income forecasts in addition to care programme design. Our reasoned revenue estimates help create support for proposed renewals.



‘MORE SUPPORT FOR PROPOSED RENEWALS WITH SUBSTANTIATED REVENUE ESTIMATES!’

PROJECT How can we accelerate integrated care with a Triple Aim approach? Experience with the Rijncoepel experiment

RESEARCH PROGRAMME TNO Central government grant for Work and Health

GREATER PARTICIPATION THROUGH WORK-ORIENTED HEALTHCARE

HEALTHCARE COSTS ARE SET TO RISE SUBSTANTIALLY IN THE NEXT FEW YEARS, COINCIDING WITH A STRUCTURAL TIGHTENING OF THE LABOUR MARKET. THE NUMBER OF WORKERS WITH HEALTH ISSUES WILL THEN INEVITABLY RISE AS THE POPULATION AGES AND PEOPLE RETIRE LATER IN LIFE. THIS COMBINATION OF HEALTHCARE AND LABOUR MARKET PARTICIPATION TRENDS DEMANDS AN INTEGRATED APPROACH TO HEALTHCARE AND WORK.

An integrated approach to healthcare and work

More cost-effective healthcare calls for a greater emphasis on participation. In other words, healthcare must help people take part in the community in a sustainable way. But how can the healthcare system help restore and improve people's functional capacity? To answer this question, TNO is investigating integrated work-oriented forms of healthcare.

Three pilot studies in Amsterdam-Zuidoost

We are conducting three pilot studies in Amsterdam with the dual aim of increasing workers' level of participation and reducing inefficient healthcare consumption by working people with health issues. The main feature of one of the pilots (IBIN) is an exercise programme, which has the aim of improving the condition, health and social skills of clients of the Amsterdam Department for Work and Income. In the second pilot (POPA) an occupational physician is employed in the primary healthcare system with the aim of activating clients. The third pilot focuses on diabetes and work, to explore how work-oriented primary healthcare might help workers with diabetes.

› **The result is more participation**

The results of the initial programmes have been released. The IBIN exercise programme encouraged people to do more sport and take on more volunteer and community work. The presence of the occupational physician in POPA led people to participate more in social life and take on more demanding work. On the other hand, the impact on healthcare consumption was less clear cut. For instance, while people in IBIN paid less frequent visits to doctors and therapists, they spent more on medication. The next step is an experiment in Amsterdam-Noord to study integrated healthcare services, together with Achmea Health, local care providers, welfare organizations and the City of Amsterdam. (See page 94).

‘HOW CAN THE
HEALTHCARE SYSTEM
HELP RESTORE AND
IMPROVE PEOPLE’S
FUNCTIONAL
CAPACITY?’

PROJECT The importance of work in integrated healthcare services
RESEARCH PROGRAMME TNO Central government grant for Work and Health

WORKING SMARTER PRACTICES IN PUBLIC ADMINISTRATION

› TODAY'S PUBLIC SECTOR ORGANIZATIONS ARE INCREASINGLY REQUIRED TO DEMONSTRATE THEIR PUBLIC VALUE AND 'VALUE FOR MONEY'. THIS FORCES THEM TO INNOVATE AND TO WORK ON THEIR PRODUCTIVITY. BUT WHICH INTERVENTIONS HELP IMPROVE PRODUCTIVITY AND PERFORMANCE? TNO DEVELOPED A TOOL TO DETERMINE THE PROPER PRODUCTIVITY STRATEGY FOR EACH ORGANIZATION.

Productivity

Public sector organizations often find productivity hard to quantify, not because they consider it to be unimportant, but because they believe the quality of the performance to be equally important. How can one assess the quantitative and qualitative aspects simultaneously?

In search of the case for innovation

The productivity improvement tool that TNO developed is based on a dialogue model. It helps generate material for discussion from studying the present situation, to developing an organizational intervention for the future situation, leading to the definition of a business case for this intervention as a basis for decisions. The five steps in the dialogue model are:

- Step 1: defining the productivity problem (and drafting a preliminary business case).
- Step 2: translating the productivity problem statement into a productivity challenge.
- Step 3: specifying a productivity strategy.
- Step 4: developing productivity-improving organizational interventions.
- Step 5: defining a business case for the organizational innovation.

A practical tool

TNO has applied the dialogue model to several cases, including a benefits agency that wanted to improve the quality of its services by reducing the turnaround time for new applications. The cases have shown this to be a practical tool for use in the public sector and elsewhere. We are now using the tool in various government projects, such as the Ministry of the Interior's Working Smarter Network (see page 102), which will promote innovation and working smarter practices in public sector organizations. Our partners on these projects are Kennisland and the Kafkabrigade. We are helping public sector organizations define a workable business case to support their own innovation.



**‘TNO HELPS
PUBLIC SECTOR
ORGANIZATIONS
DEFINE THE
BUSINESS CASE
TO SUPPORT THEIR
OWN INNOVATION.’**

PROJECT The business case for innovation in public sector organizations: working smarter in public administration.

RESEARCH PROGRAMME TNO Central government grant for Work and Health

NO OBSTACLES TO PUBLIC SECTOR WORKERS WITH INNOVATIVE IDEAS

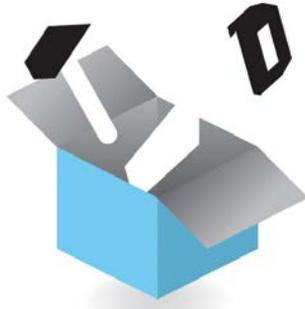
› THE WORKING SMARTER NETWORK “SLIMMER NETWORK” LINKS PUBLIC SECTOR INNOVATORS, IN PARTICULAR IN NATIONAL AND PROVINCIAL GOVERNMENTS, MUNICIPALITIES, DISTRICT WATER BOARDS AND THE POLICE. THE AIM IS TO BRING TOGETHER PROFESSIONAL AND MANAGERIAL INNOVATORS TO GATHER AND DISSEMINATE IDEAS ABOUT SMARTER WAYS TO RUN THE PUBLIC SECTOR.

More productive, enjoyable and professional work

The aim of the Working Smarter Network is to find smart ways of making the public sector more productive, while increasing workers’ enjoyment and professional standards. A bottom-up approach is used, unrestrained by organizational boundaries. Ever more public sector workers with innovative ideas are joining the project. The network is not just a talking shop, but involves real work, which is on a voluntary basis, partly in private time.

Four components

The four components of the network are an online group on LinkedIn, Do Tanks, Working Smarter Network Cafés and the Knowledge Network. The LinkedIn group is a digital clubhouse for sharing and discussing ideas. Professionals can raise any practical problems they encounter in the workplace as a case study for the Do Tanks, whose members are active innovators who like to sink their teeth into the latest practical issues. Do Tanks are think tanks that also put the solutions they devise into practice. The Working Smarter Network Cafés are a meeting place where members can take part in workshops and exchange ideas, and the Knowledge Network is a platform for developing ideas from a variety of areas of expertise for a smarter public sector.



From ideas to action

The Working Smarter Network goes beyond good ideas to explore how to implement them. One example is the Debt Counselling Do Tank, in which various public sector parties are experimenting with ways of coordinating debt counselling and public sector debt collection. The Working Smarter Network has met with an enthusiastic reception. Public sector workers are keen to use the freedom and support they receive in renewal from the bottom-up and inside out.

The network is supported by a consortium comprising Kennisland, Kafkabrigade and TNO. TNO's focus is on knowledge development, knowledge sharing, the implementation of new ideas and network evaluation.

**'A NETWORK THAT
GIVES PROFESSIONALS
THE FREEDOM
TO WORK ON AN
INNOVATIVE, SMARTER
PUBLIC SECTOR.'**

PROJECT Working Smarter Network (WSN)

CONSORTIUM PARTNERS Kennisland & Kafkabrigade

FUNDING (PARTICIPANT) Ministry of the Interior and Kingdom Relations

WORKING MORE PRODUCTIVELY AS AN ALTERNATIVE TO CUTBACKS

THE ONGOING CRISIS IS LEAVING THE GOVERNMENT WITH NO CHOICE BUT TO CONTINUE TO CUT COSTS. GOVERNMENT ORGANIZATIONS MUST BE MADE MORE EFFICIENT AND MORE EFFECTIVE. HOWEVER, THE TRADITIONAL EXPENDITURE-REDUCTION APPROACH WOULD NOT LEAVE ORGANIZATIONS ANY BETTER OFF: GOVERNMENT WILL INDEED BE MORE COMPACT, BUT WILL THEY ALSO BE ABLE TO DO MORE WITH LESS? THIS LED TNO TO SEEK NEW WAYS TO IMPROVE PUBLIC SECTOR PRODUCTIVITY.

Methods compared

This project evaluated various existing performance-enhancing methods that government organizations can use. We compared and contrasted them in light of earlier experience in government and industry. We field-tested the available methods in specific practical cases, and discussed the findings with the actors involved. We now have a clear view of what makes a measure both practical and effective.

Learning from experience

The three most promising instruments that our research identified are: experience curves, target costing, and project management.

Experience curves are used in industry to demonstrate how costs fall as experience with a given product accumulates. The shape of a curve allows managers to forecast when productivity gains will materialize.

It is likely that government organizations would benefit similarly from the experience they have acquired with their own products and services.

Better cost control

Another important instrument is target costing, which was a cornerstone of the Japanese automotive industry. Target costing for public authorities would require them to specify the maximum cost of a product or service in advance. Staying within this limit is likely to entail improvements to processes. Last but not least, project management is also an effective instrument.



‘INNOVATIVE INSTRUMENTS FOR IMPROVING PUBLIC SECTOR PRODUCTIVITY.’

PROJECT Making government organizations more productive/High Road 2012
RESEARCH PROGRAMME TNO Central government grant for Work and Health

A COMPLETE COLLECTION OF FIGURES ABOUT FLEXIBLE WORK AND FLEXIBLE WORKERS

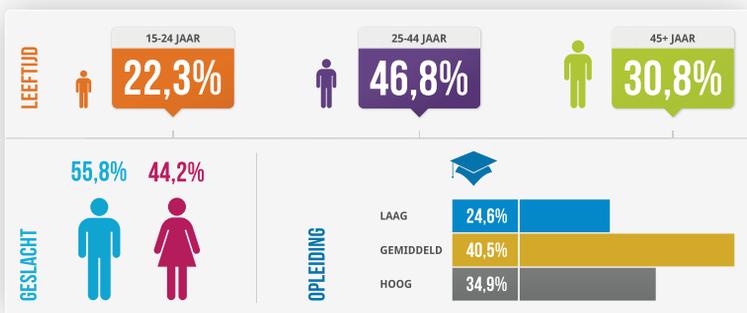
THE NUMBER OF WORKERS WITH FLEXIBLE WORKING ARRANGEMENTS HAS GROWN IN RECENT YEARS TO 30 PER CENT OF THE LABOUR MARKET. IT IS IMPORTANT FOR POLICYMAKERS AND OTHER STAKEHOLDERS TO HAVE A COMPLETE AND ACCESSIBLE SET OF FACTUAL INFORMATION ABOUT THIS GROWING GROUP. THIS IS WHY TNO, TOGETHER WITH THE GOVERNMENT, TRADE UNIONS AND EMPLOYERS IN UNISON LAUNCHED WWW.FLEXBAROMETER.NL.

The rise of flexible workers

The number of flexible workers is increasing, and includes self-employed people with no employees of their own and workers without a permanent contract or regular working hours. Exactly how many flexible workers are there now, what characterizes them, and what is their quality of work? So far there has been no accessible set of representative figures to inform a public debate and lead to well-substantiated policy.

A need for objective information

The website is for policymakers, organizations of employers, trade unions, companies and other interested parties, where they can find objective information about flexible workers in the Dutch labour force: their numbers, personal traits, the quality of work and how firms use these atypical forms of employment. The Flexbarometer is objective and is based on representative data sources from Statistics Netherlands and TNO.





The definitive information source for flexible work

In the next few years the Flexbarometer is set to become the definitive website, with even more figures about flexible working. Data will also be added that originates with other partners, as well as new research data that are now missing, such as about specific groups of flexible workers, flexible workers' motives and company policies. The Flexbarometer was developed by TNO together with the Federation of Private Employment Agencies ABU and trade union FNV, with support from the Ministry of Social Affairs and Employment.

**'THE FLEXBAROMETER
PROVIDES WELL-
SUBSTANTIATED
INFORMATION ABOUT
THE TREND TOWARDS
FLEXIBLE WORK.'**

PROJECT FlexBarometer development

RESEARCH PROGRAMME TNO Central government grant for Work and Health

VIRTUAL AND AUGMENTED REALITY IMPROVE WORKING CONDITIONS AND PRODUCTIVITY

› A FULLY EQUIPPED SENSOR SUIT THAT CAN RECORD WORKERS' MOVEMENTS IN REAL TIME AND AUTOMATICALLY REPORT ON THE PHYSICAL WORKLOAD. THIS IS ONE OF THE PRACTICAL INDUSTRIAL APPLICATIONS OF VIRTUAL AND AUGMENTED REALITY (VR/AR), DEVELOPED BY TNO. WE DEVELOPED THE SENSOR SUIT IN THE MANUVAR RESEARCH PROGRAMME, AN EU PROJECT WITH EIGHTEEN PARTNERS FROM EIGHT DIFFERENT COUNTRIES.

What is ManuVAR?

The aim of the ManuVAR project is to open the way for virtual and augmented reality (VR/AR) applications in advanced, knowledge-intensive and manual industrial work. Using these new technologies will allow European industry to be more competitive. The technologies can be used to improve productivity and quality, but also to improve ergonomics, safety and communication in the workplace.

The result is practical tools

The ManuVAR research programme incorporates pilot projects in clusters including aerospace development, mechanical engineering, train maintenance, power plant maintenance and assembly operations. Some examples of the results are:

- *APLE (Automated Physical Load Evaluator)*
Sensor suit and software for fast and reliable physical workload measurement. The operator briefly wears a sensor suit to record work posture and movements, which then automatically assesses the results against international physical workload guidelines.
- *Augmented reality as an instruction tool (with Total Productivity)*
An assembly station equipped with augmented reality, to give the operator instructions and pick the required components.
- *Ergomix: mixed reality*
Ergomix mixes drawings of workstation designs on the display with images of real people. The virtual workstation allows assessment and online improvement of ergonomics and productivity early in the design stage. Ergomix helps produce workstations at which employees can work productively and without risk of physical symptoms. Besides assembly stations, examples include maintenance-friendly cab and machine designs.

Tested in practice

The tools that have been developed have been tested in practice in various companies, with favourable results. For instance, Ergomix reduced development time substantially because the design was right



first time. Ergomix also improved communication between designers, engineers and production workers. The other tools also had a clear and positive impact, with higher productivity at the work position, lower physical workload and risk of injury, higher quality of work and a shorter learning time.

According to a client:

‘Design meetings can tend to be the exclusive realm of engineers, but Ergomix brings the operator, engineers and supplier together. This makes for more fruitful discussion. It is also possible to input design changes immediately.’

A director of operations says:

‘APLE definitely added value when the work situation changed. The benefit of being able to see improvement potential is enormous. An idea I had for rotating workers after four hours could be confirmed and objective evidence was produced.’

‘FASTER, SAFER AND MORE ACCURATE WORK THROUGH AUGMENTED AND VIRTUAL REALITY.’

PROJECT ManuVAR

FUNDING EU, participating companies, TNO Central government grant for Work and Health



› IT IS PEOPLE THAT
MATTER MOST
IN INNOVATION –
THEY ARE THE SOURCE
OF INNOVATIONS
THAT WORK!

The logo features the letters 'TNO' in a bold, black, sans-serif font. To the right of 'TNO', the words 'innovation' and 'for life' are stacked vertically in a smaller, black, sans-serif font. A horizontal bar spans the width of the text, with a black segment on the left and right, and a light blue segment in the middle that overlaps the 'TNO' and the words 'innovation' and 'for life'.

TNO innovation
for life

› COLOFON

› EDITORIAL TEAM

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