

Annual Report 2012



Coordination in the top sectors

"We want a constructive discussion"

Good, better, debatable

The Dutch do not support 'tinkering'
with healthy people

CONNECTIONS

If I had to sum up 2012 for the Rathenau Instituut in a single word, that word would be 'connecting'. Throughout the year, we forged new connections with various organisations at home and abroad, and we intensified our existing partnerships. Joint action is crucial in the field of science and policy because significant interests are at stake within the 'golden triangle' of government, the private sector, and the universities and research institutes.

The Rathenau Instituut continues to build bridges in the Netherlands, Europe and beyond. In 2012, we stepped up our cooperation with parliament. At the European level, we joined our sister institutes in the PACITA project, which will develop new opportunities for technology assessment. We also entered into partnership with Japan and Germany in the field of evidence-based policy.

The Dutch government has designated a number of 'top sectors' which are of particular importance to the economy. The top sector programme has reached the next stage of maturity, and in 2012 the Rathenau Instituut did much to promote the formation of political opinion with regard

to its coordination. We did so in a constructive manner, based on our independent position. Our efforts were much appreciated, not only by our 'own' Ministry of Education, Culture and Science (OCW), but also by the Ministry of Economic Affairs (EZ) with which we now enjoy closer contact.

In November, our chairman Sander Dekker was appointed State Secretary of Education, Culture and Science. This is a great honour which reflects well on the institute. However, his departure meant that we had to go in search of a replacement at comparatively short notice. We were delighted to be able to welcome Gerdi Verbeet, who brings considerable expertise, commitment and energy to the role.

I am gratified that the Rathenau Instituut can now present its message to an ever increasing number of stakeholders. By listening to each other and by acknowledging each other's expertise, we shall build yet more, even stronger connections in future.

Corien Prins, Acting Chairperson



CONTENTS



- 4 Young people debate synthetic biology**
Should researchers publish sensitive data about a dangerous virus?



- 6 Good, better, debatable**
The Dutch are against 'tinkering' with healthy people.

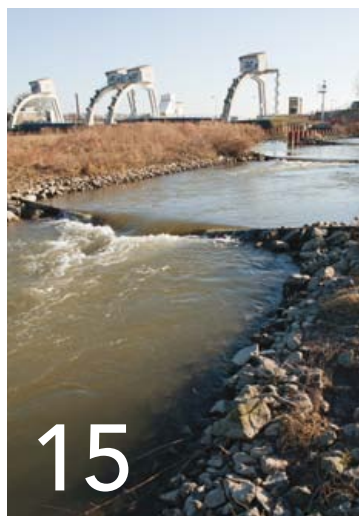
- 11 Jan Staman's Top Five**
Jan Staman, director of the Rathenau Instituut, lists the five main themes of 2012.

- 12 2012 in figures**



- 15 Coordination in the top sectors**
"We want a constructive discussion"

- 18 Robots everywhere**
The new generation of robots are not only found on the factory floor...



- 19 Creating social impact**
Scientific research has an impact in more ways than we think...

- 20 2012 in figures**

- 22 Publications**



Young people debate synthetic biology

Should researchers publish sensitive data about a dangerous virus? Is it responsible to create bacteria which could make barren land fertile? In 2012, the Rathenau Instituut organised a debate at which students and experts came together to discuss synthetic biology.

Government and the private sector wish to establish a bio-based economy. The transition to this type of sustainable society demands the use of synthetic biology. But how far should we go in 'redesigning nature'? Are we aware of the potential consequences? Earlier discussions about emerging technologies, such as genetically modified organisms, have forced scientists, technology developers and government departments to acknowledge the importance of timely dialogue and public support. The synthetic biology debate has been ongoing in other countries for some time. Thus far, however, in

the Netherlands the public and the societal organisations have had little to say. "That is a shame," comments Virgil Rerimassie, organiser of the youth debate, "because now is the best time for politicians and societal organisations to influence the direction that the technology will take."

The Rathenau Instituut held the youth debate in association with iGEM, an international competition run by MIT in America, in which students devise simple new biological systems. In 2011, the Rathenau Instituut organised a debate involving iGEM competitors and members of political youth organisations. In early 2013, an informal meeting was held to which experts from various ministries contributed.

Pre-programmed: you are what you find

A little help when searching the internet can be welcome, otherwise we might drown in a sea of information. But Google is now going beyond 'a little help', Rathenau Instituut researchers conclude. In the 'Pre-programmed' research project, they delved into the world behind

the internet. Google remembers the search terms we use, our geographic location, the pages we visit and almost everything else we do online. Its search results then steer us in a certain direction without our realising it.

"We often do not know what do not get to see," commented Frans Brom, head of Technology Assessment, on the television programme Kassa in May 2012. "The Internet is our window on the world, but the glass in that window is not always transparent."

Following the broadcast, Kassa asked viewers to submit examples of remarkable search results under the motto, 'You are what you find'.



TOF: figures for informed policy decisions

In 2011, the Rathenau Instituut became responsible for the production of the annual 'Summary of Total Research Funding', known by the Dutch abbreviation TOF. The document's ten A4 pages summarise the government's investments in scientific research.

Jan van Steen has been collecting data for the TOF for over twenty years, initially as part of his work for Ministry of Education, Culture and Science, and more recently as a Rathenau Instituut researcher. "Policymakers need information. We ensure that everyone has access to the essential facts and figures. We publish the data in as 'raw' a form as possible, as subjective information does not contribute to the debate."

Producing a full overview of government expenditure takes time. "I need to obtain the budgets and figures from each ministry

individually. Much has been harmonised over the years, but it still takes a lot of work. In some cases, we have to make estimates and assumptions. Of course, we do so as conscientiously as possible. The figures give an accurate picture of government investments over time."

The TOF 2012 focuses on the period 2010 to 2016. It shows that government funding increased in the period to 2011 and then began to decline. Direct government funding is falling due to the discontinuation of the innovation programmes and FES projects, as per the 2010 coalition agreement. However, indirect contributions to private sector research are increasing (due to reduced taxation) and remain high by international standards. "Our figures are useful for policy makers in various settings: in ministries, universities, and research funding bodies, for example."



The Dutch are against 'tinkering' with healthy people

Good, better, debatable

Human enhancement technology can make you fitter, cleverer and happier. But at what price? The Rathenau Instituut has drawn attention to the dilemmas by means of the public opinion research project, 'Good, better, debatable'.

As one person said during a group discussion, "I am now 35. I see people on television who are over 50 but look younger than I do. Then I think, yes – I wouldn't mind!" Cosmetic surgery, performance enhancers and fertility treatments are now commonplace. They may soon be joined by new drugs and techniques such as embryo selection and brain implants to improve one's mood. "So far, the discussion about human enhancement has been confined to the experts," states Mirjam Schuijff, who led the research. "But it is something that affects us all. We therefore set out to gauge the opinions of everyday people."

Safe, fair and optional

The researchers held five group discussions to which people of various backgrounds were invited. In general, they were against using medical technology to improve the everyday performance or appearance of healthy people. However, they did see the advantages of enhanced learning ability at school, a leaner figure or a sunnier disposition. In all cases, safety is paramount and any new technology must be available to everyone. The participants were concerned that healthy people might pretend to be sick just to gain access to new drugs or technologies. Similarly, some

people could be classed as 'sick' because the bar gets raised and the definition of 'normal' or 'healthy' changes. Participants also insisted that human enhancement technology should never be obligatory. This might seem a 'given' today, but already, there are American military pilots

Kennislink.nl as well. This website for popular science has started a cooperation with the Rathenau Instituut. There is also a free iPhone gaming app, SuperHuman. Players climb a virtual Mount Everest or Kilimanjaro and can opt to use certain performance-enhancing technologies. They must

"To date, the discussion about human enhancement has been confined to the experts. But it is something that affects us all."

who take pills to aid concentration and alertness. A small number of respondents were fervently opposed to human enhancement in any form, believing that it represents 'interference' in the natural order or creation.

The project's final report, published in November 2012, concludes that it is now time for the government to take action. It must implement measures to ensure safety, perhaps by bringing all human enhancement technologies within the scope of European legislation on medicines. The government must also consider how to prevent a divide between those who use enhancement techniques and those who do not, and how to avoid social pressure in the workplace.

Self-test, blog and iPhone game

The final report does not mark the end of the project. The researchers have also produced an online test which lets people discover where they stand on the subject of human enhancement. The test is accompanied by a blog written by the researchers and guest contributors, which promotes further online discussion. The blogs are used as starting point for online debate by

decide what risks and side-effects are acceptable. As they chat and spur each other on, players are encouraged to think about their own limits and boundaries. "This is the Rathenau Instituut's first ever gaming app," Mirjam Schuijff adds. "We hope that it will help us to reach a broader target group than with the reports alone."

Public interest

The report attracted much media attention and several national newspapers published feature articles on it. The researchers were also interviewed on a leading radio programme, and have been invited to contribute to various scientific meetings and conferences. Visitors to the Kennislink website shared their test results on Twitter, Facebook and LinkedIn, while the website itself hosted a very lively online debate. A live debate is scheduled for 2013. "We want to reach many more people," says Schuijff. "This is a very topical issue. It is good that so many people are now thinking and talking about it."

A DOCTORATE - WHAT NEXT?

Too many young researchers are being trained for a career in science itself. Many young PhDs find employment outside academia, albeit at the appropriate level. Is this a bad thing?

In June 2012, the Rathenau Instituut organised a discussion about career prospects for young researchers. It was attended not only by researchers, but also by university Human Resources (HR) managers, the professional federation for academic staff, officials from the Ministry of Education, Culture and Science, and specialist career advisors from the leading national research institutes.

"The meeting was successful because it brought together all these different interests and points of view," says Pleun van Arensbergen, career path researcher with the Rathenau Instituut. "People were eager to share experiences and learn more about each other's worlds." The mix of policymakers, specialists and (recent) graduates enabled the participants to arrive at concrete

and practical recommendations which will benefit all concerned. University HR managers, for example, must realize that many young researchers will leave the university as soon as they have earned their doctorate. The HR approach should be a combination of educational policy and employment policy. The young researchers must devote attention to their other, non-academic skills so that they can present themselves successfully to potential employers. Coaching from a mentor can help.

"When people gain a doctorate and immediately find employment outside academia, this should not be seen as a loss. Rather, it is a form of valorisation: their knowledge will now benefit society at large."



Women are gaining ground

Female researchers are slowly catching up with their male colleagues in terms of productivity. Within the established generation of researchers, men are responsible for significantly more publishing than women. Among younger researchers, however, this is no longer the case. In the social sciences, women have actually overtaken men.

These are among the findings of research by Pleun van Arensbergen (Rathenau Instituut), Peter van den Besselaar (VU University Amsterdam) and Inge van der Weijden (Leiden University), as published in the September 2012 edition of *Tijdschrift voor Genderstudies* (Journal for Gender Studies). The research also shows an increase in the number of publications by senior female

researchers. Will today's young researchers continue to publish with such frequency later in their careers? The Rathenau researchers intend to monitor this over time.

"It is sometimes claimed that women are overlooked for professorships because they are less productive than men," says Van Arensbergen. "In the case of young researchers, we can see that this is simply not true. Women produce a high output and should enjoy exactly the same career opportunities as men." The research attracted much attention. Reports have appeared in several national newspapers, one of which published an interview with Pleun van Arensbergen. There has also been a lively discussion on Twitter.

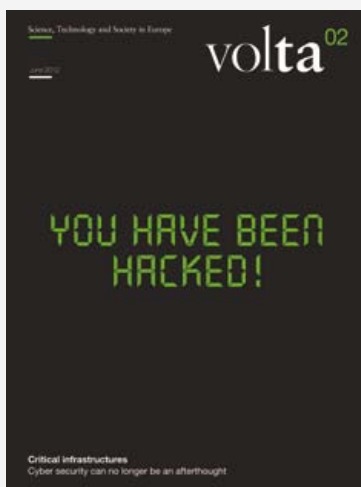
Countries learn from each other

For over 25 years, the Netherlands has had an organisation which promotes the formation of public and political opinion on science and technology: the Rathenau Instituut. But there are countries which have yet to establish a similar institute or have done so only recently. They include Bulgaria, Ireland and Portugal. Within the European PACITA project, the established institutes are working alongside the newcomers in order to learn from each other and develop new possibilities for technology assessment.

"In 2012, I was asked to show the Bulgarian Applied Research and Communications Fund how we work," states Rathenau Instituut researcher Geert Munnichs. "Technology assessment is not yet standard practice in Bulgaria. There is little debate about science and technology."

In 2012, the Rathenau Instituut published a description of the European institutes engaged in technology assessment. Some have close links to the political arena, others stand closer to science or to the media. Their research approach also varies, from academic to journalistic, and from desk research to large-scale public panels.

The Rathenau Instituut is responsible for the PACITA project's journal VolTA, which encourages politicians, policymakers and researchers to consider the societal consequences of technological developments. VolTA is published twice a year, in English. The Rathenau Instituut also organises the Future Panel on Public Health Genomics, a series of meetings for experts and politicians to raise awareness of how DNA research will affect healthcare in the future.





JAN STAMAN'S TOP FIVE

Jan Staman, director of the Rathenau Instituut, lists the five main themes of 2012.

1 **Trust**

Trust in science is still high. However, trust in politics and policy is declining. I am very concerned about that. The public mood has changed. People are more pessimistic, more anxious. The challenge is to find an appropriate response.

2 **Progress**

Science and technology stand for progress. At least, that is the theory and in part it is true. Science and technology have given us greater comfort and prosperity. But what about the promise of the Enlightenment? That knowledge would also bring moral progress, that it would make us better people? Philosophers such as John Gray say that this has not become a reality. Must we live with the idea that mankind will remain set in its ways?

3 **Agonistic democracy**

The Rathenau Instituut is part of a tradition which is based on deliberative democracy, in which conflicts are solved through dialogue and debate. But in practice, we now see little of deliberative democracy. We seem to be living in an agonistic democracy, in which factions are constantly arguing – just look at the social media! Breaking this impasse will be an interesting challenge for institutes such as ours.

4 **Grand challenges**

Europe has set aside billions to fund research which will solve the 'grand challenges': major social issues such as ageing and the energy crisis. But research alone is not enough. Nothing can happen without political direction and a system of co-creation between science, policy, the private sector and society at large. I urge Europe to make effective use of all the possibilities for co-creation.

5 **Regulatory science**

The discussion about the possibilities and limitations of evidence-based policy continued unabatedly in 2012. How can we ensure that scientific findings are translated into policy in the best, most effective way? That discussion often focuses on the universities. I wish to draw attention to the importance of applied science, as practised by institutes such as the Dutch KNMI, RIVM and WODC. I would also like to see these institutes take a more prominent role in the debate about evidence-based policy.

2012 in figures

Parliamentary questions

16x



'Kidney for sale, womb for rent' (2011)

In November 2012, MP Pia Dijkstra (D66) asked the Minister of Health, Edith Schippers:

"What is your response to the researchers of the Rathenau Instituut and the national rapporteur on human trafficking who state that current donation practice in the Netherlands must be adapted to address the new reality of the international trade in human organs? Are you willing to explore possibilities in this regard?"

Parliamentary proceedings

7x



Total Research Funding Review (TOF) 2010-2016

"The members of the D66 faction would like a response to the Rathenau Instituut report which concludes that the cumulative effect of government measures is to reduce investments in science and innovation by ten per cent. [We] find this a cause for concern, and wish to know whether the government shares our view" (Memorandum on proposed amendments to the Study Financing Act, March 2012.)

"There is a marked lack of clarity regarding research funding, as evinced by the discussion between the Rathenau Instituut and the State Secretary. Figures are being flung back and forth with abandon." (Socialist Party member Jasper van Dijk during the general discussion of the Science Budget, August 2012.)

Valuable: indicators for valorisation

"I find the report to be a welcome step towards the development of a set of indicators for valorisation, in the broadest sense of the word." (Written response by the State Secretary for Education, Culture and Science, Halbe Zijlstra, January 2012.)

"According to the Rathenau Instituut, one problem is that scientists are not being held accountable, or to phrase it in a positive way, rewarded for the valorisation of knowledge. Does the minister believe that sufficiently firm agreements are in place, and that they can be met?" (Elbert Dijkgraaf of the Reformed Protestant Party during the discussion of the departmental budget of the Ministry of Economic Affairs, February 2012.)

In the media



34x

Interviews on
radio and
television



22x

Opinion pieces
and interviews
in print media



61x

Other articles in
printed media



22x

Blog posts,
columns, opinion
pieces and
interviews online



189x

Other articles
online

Quote

"Researchers must understand how politics works."

Interview with director Jan Staman in *De Volkskrant*, 4 February 2012, prompted by the publication of the report *Policy and the evidence beast* (about evidence-based policy, available in English).

Twitter



@RathenauNL

28 staff have a twitter account

Tweets

Twitter @wrubens

What is your standpoint on technology?

I am a functionalist. Good technotest!

@wrubens = Wilfred Rubens, Open University Centre for Learning Sciences and Technologies (CELSTEC).

The test to which he refers allows users to determine their 'technotype'.

Twitter @Laracoomans

I must tweet something.

I think I've been pre-programmed.

@Laracoomans = Lara Coomans of SETUP, a Utrecht-based platform for the fusion of technology and culture, in response to the publication of the report, 'Pre-programmed: how the internet controls our lives'.

Twitter @Brechtje_

There is a transhumanist in the room! He would use all these technologies to enhance himself.

@Brechtje_ (real name and profession unknown) = an 'enthusiast' and 'knowledge omnivore' from Utrecht, in response to the publication of the report, 'Good, better, debatable'.



“We want a constructive discussion”

Coordination in the top sectors

The Dutch government has designated a number of ‘top sectors’: those which are particularly important to the economy. The programme began in earnest in 2012, as the government, private sector and the research institutes and universities entered into agreements covering the joint research they will undertake in the years ahead. The Rathenau Instituut helped to promote the formation of political opinion regarding the coordination of the top sectors.

Over the course of several decades, the Netherlands’ science system has seen the creation of various coordinating bodies: executive agencies, large-scale research programmes, and now the top sectors and the Top Consortia for Knowledge and Innovation (TKIs). They exist to mediate between the government, funding bodies and the research field. Laurens Hessels is a science system researcher who contributes to the policy discussion on the coordination of research and innovation. “Our

research into the constructions of the past is intended to provide input for how the top sectors should be structured today.”

Preventing proliferation

In June 2012, Laurens Hessels and Barend van der Meulen published a blog post in which they warned against organisational proliferation. “In the context of our research, we were curious to know how the top sectors planned to organise themselves. We found that some

intended to create several consortia, which would lead to a veritable forest of such 'top consortia'. We published our blog on the eve of the parliamentary consultation with the Minister of Economic Affairs, pointing out that there are already many coordinating bodies for science and innovation. We called for caution in creating yet more. The next day, parliament questioned the Minister of Economic Affairs about the plans for the top sectors. He shared our concern. Of course, it is impossible to tell just how great our influence was, but the top sectors have indeed reduced the planned number of consortia."

Learning from the past

In July 2012, the Rathenau Instituut published a report on research coordination within the 'Golden Triangle'. The authors note that, while the top sector approach itself may be new, the Netherlands has a strong tradition of public-private research. The new top consortia can therefore benefit from past experience. Moreover, the top consortia can learn from each other. This is one of the conclusions of a report published by the Rathenau Instituut in January 2013. Of course, each sector has its own specific problems. There is no 'one size fits all' approach. "Think of it like a football team," says Hessels. "Everyone plays in

the same colour, but some shirts are M and others are XL. The trick will be to ensure that every top consortium has the right size of shirt."

The researchers also suggest that there should be a central point through which the knowledge and experience gained by the various top sectors can be shared. "Until such a system is introduced, much knowledge and expertise will go unused."

It seems that the Minister of Economic Affairs has taken the Rathenau Instituut's advice to heart. In a written response to parliament, he promised to join the relevant stakeholders in strengthening the top sectors' learning ability.

Input

The Rathenau Instituut is now regularly asked for input. Professional journals request interviews, the researchers are invited to give lectures, parliament continues to show interest, and it now has fixed contact within the Ministry of Economic Affairs. "We hope that we can continue to make a constructive contribution to the development of the top sectors," states Hessels, "not least by means of the reports and articles we shall publish in 2013."

"Of course, it is impossible to tell just how great our influence was, but the top sectors have indeed reduced the planned number of consortia."

PRIVACY DAY

“I have nothing to hide,” is often the first reaction when people are asked about their opinions on privacy and IT. Experts, however, are calling for more effective identity management and greater clarity with regard to the government’s intentions.

In March 2012, the Rathenau Instituut and the *Expertisecentrum Journalistiek* (Centre of Expertise in Journalism) held a meeting about privacy, and about how individuals can maintain control of the digital information which exists about them. Experts considered the practical and technical aspects of the new media and other forms of IT. Central issues were privacy issues related to medical records, the public transport smartcard, biometric passports and the social media.

Rathenau Instituut researcher Geert Munnichs led the workshop on digital patient files. “The journalists showed great interest and there was a lively discussion. Since the meeting, many journalists have contacted us for further information.”

The Rathenau Instituut organised the Privacy Day event because an increasing volume of personal information is now stored in databases, many of which are interlinked. We wished to inform the media about current developments, thus helping to ensure the quality of reporting on the subject. The meeting was held in Hilversum and was attended by over fifty editors from the print and broadcast media, research journalists and freelance reporters.

At the end of the day, Dick van Eijk, chair of the *Expertisecentrum Journalistiek*, addressed those present. “Almost all your questions today were from a personal perspective, not that of a journalist. The sort of questions you should have asked are: how much does a system cost? What are its benefits? How are matters arranged in other countries?”



ROBOTS EVERYWHERE

The new generation of robots will not only be found on the factory floor. They will look after the elderly, serve in restaurants and guard important buildings.

In May 2012, the first copy of the book *Overall robots* ('Robots everywhere') was presented by EVA, the robot carer. Do we want robots to look after our elderly relatives? What do we think about military robots which can take the decision to kill? These are just two of the political and ethical questions addressed by the book.

"We are living in the internet age," explains co-author Rinie van Est. "But the internet is now being given hands, feet, eyes and ears whereby we are gradually moving into the robot era. We believe that everyone should be aware of the transition to come. Robots are becoming smarter, more adept and more independent. Cars are

becoming independent: as GPS navigation systems already suggest the best route, and cars can prevent us from driving too fast. The US Army is making huge investments in the development of 'drones': unmanned miniature aircraft which can take decisions about life and death independently. Is this what we want?"

The book and the research on which it is based have attracted much media attention. The researchers are frequently asked to contribute to discussions and they have also organised a number of workshops. The Rathenau Instituut believes that politicians and policymakers must take notice of the global robotics revolution.



Creating social impact



Scientific research has an impact in more ways than we think, contends valorisation researcher Leonie van Drooge. In 2012, she spoke to researchers, politicians and public sector officials about reaping the practical benefits of knowledge.

It is now several years since valorisation became the third official task of universities, but it remains difficult in practice. "The Netherlands has a formal valorisation policy," says Van Drooge. "The next step must be to implement that policy in an effective way. This is why the Rathenau Instituut takes an interest."

In January 2012, the Rathenau Instituut took part in a round table discussion with the Parliamentary Standing Commission for Education, Culture and Science. The Rathenau Instituut wrote a memorandum setting out how valorisation can best be approached by the universities, produced in preparation for the that parliamentary discussion with the (then) Secretary of State, Halbe

Zijlstra. The Rathenau Instituut researchers also attended the discussion itself. "It was a meaningful debate. I am glad that we were able to contribute."

Leonie van Drooge has not restricted her attention to politicians and government officials. She also spoke at a symposium for social psychologists who were keen to learn how they could valorise their knowledge. This might entail giving lectures, contributing to online debates, or sitting on advisory committees. Leonie van Drooge uses all such methods in her own valorisation process: she has given lectures and workshops at various events organised by the Netherlands Environmental Assessment Agency, the annual conference of 'science shops', the Valorisation Day event, Nijmegen Science Café, and for researchers in the arts and social sciences at Utrecht University. "The scientists in the audience are coming to realise that valorisation is something that can be learnt."

Dutch knowledge institutes in foreign hands?

Institutes of applied knowledge have been hard hit by government cutbacks in research expenditure. As a result, they will need to find foreign funding. That prediction was published in a national newspaper, *Het Financieele Dagblad*, on 11 February 2012. The opinion piece was written by authors were Barend van der Meulen (head of Science System Assessment at the Rathenau Instituut) and Wim van Vierssen (director of KWR Watercycle Research Institute and professor of knowledge management at TU Delft).

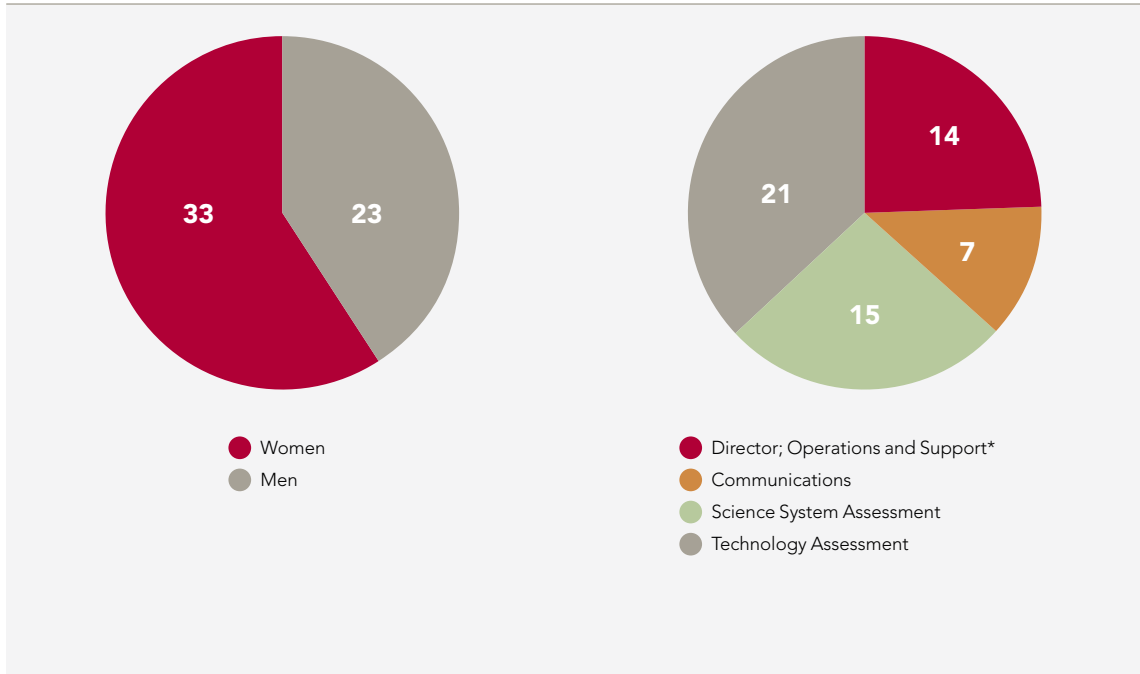
The government's top sector policy focuses on the Netherlands itself, but the domestic market is just

too small. The water sector, for example, is global in nature. Clean drinking water, sanitation and rising sea levels are issues which affect all countries. Moreover, water is an area in which the Netherlands has traditionally excelled. Knowledge institutes need to 'cash in' on their expertise far beyond the national borders. By consequence, the Dutch government will need to accept that foreign governments will assume co-ownership of those institutes.

The Rathenau Instituut is doing case studies to examine the position of the knowledge institutes and how they can respond to the internationalisation of policy and knowledge.

2012 in figures

Staff on 31 December 2012



* Operations and Support also work for the Huygens Institute and for DANS (Data Archiving and Networked Services)

Website



Digital newsletter



- 11 editions
- Subscribers (end 2012): 1,450

Blogposts



Comments on weblogs

On webdating:

"Perhaps you cannot find those attractive men and women in cafés or on websites. Perhaps they can be found at a sports club, on the train, or even at a lecture."

On human enhancement:

"I see these interventions as a sign of powerlessness. I think the human body may have possibilities which have yet to be discovered, but which represent the next stage in our evolution."

On the internet:

"You cannot develop your social skills if you spend your day at school with a laptop, or if you play games alone in your room. I see a cloud looming because today's children must one day find their way in life. And they will be running this country..."

Publications

Periodicals and journals

1x Flux / no. 7 (May)

3x Volta / no. 1 (January),
no. 2 (June), no. 3 (November)

11x Digital newsletter

Rathenau Instituut publications

Belder, R., Verbree, M., Weijden, I.C.M. van der, & Meulen, B. van der,
Een andere stijl van academisch leiderschap? The Hague: Rathenau Instituut

Braak, S. van den, Keulen, I. van, Quast, J., Schuijff, M. & Wel, L. (eds.)
Debat Van pedoscan tot gedachtehelm. Wat betekenen brein computer interfaces voor VenJ. The Hague: Ministry of Security and Justice/ Rathenau Instituut (Report)

Chiong Meza, C. *Facts and Figures – The Dutch Universities.* The Hague: Rathenau Instituut (available in Dutch and English)

Daemen, F. & Est, R. van,
Overall robots. Automatisering van de liefde tot de dood. The Hague: Rathenau Instituut

Est, R., van & D. Stemerding,
Making perfect life: European governance challenges in 21st century bio-engineering. Brussels: European Parliament

Ganzevles, J. & Est, R. van.
TA Practices in Europe. The Hague: Rathenau Instituut (PACITA project, deliverable 2.2, in English)

Goede, M. de, Arensbergen, P. van, Belder, R. & Jonge, J. de. *Gepromoveerd, en dan? – Report of discussion meeting*

Hessels, L. & Meulen, B. van der.
Coördinatie in de topsectoren. De geplande TKI's en hun uitdagingen. The Hague: Rathenau Instituut

Hessels, L. *Coordination in the Science system.* The Hague: Rathenau Instituut (Working paper)

Hessels, L. *Op weg naar effectieve Topconsortia voor Kennis en Innovatie.* The Hague: Rathenau Instituut

Hof, C.C.G. van 't, Timmer, J. & Est, R. van,
Voorgeprogrammeerd – Hoe internet ons leven leidt. The Hague: Boom Lemma Uitgevers

Horlings, E. & Gurney, T.
Search strategies along the academic lifecycle. The Hague: Rathenau Instituut

Horlings, E. *Mapping sustainability science in the Netherlands 1996-2010.* The Hague: Rathenau Instituut

Horlings, E., Gurney, T. & Somers, A.
The societal footprint of big science. The Hague: Rathenau Instituut (in English)

Jong, S. de, Hessels, L. & Meulen, B. van der. *Societal impact analysis next generation infrastructures.* The Hague: Rathenau Instituut

Lintsen, H. & Velzing, E.-J.
Onderzoekscoördinatie in de gouden driehoek. Een geschiedenis. The Hague: Rathenau Instituut

Merkx, F. *Samenwerken aan werkzame kennis. Methoden en technieken voor kenniscocreatie.* The Hague: Rathenau Instituut

Merkx, F., Roks D. & Wardenaar, T.
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Who was Mr Rathenau?

In 1978, the Dutch government wished to identify the likely societal effects of computer automation, then a rapidly emerging technology. Would the introduction of the micro-chip lead to mass unemployment, or would it bring new (economic) opportunities? The commission charged with answering this question was led by Prof. G.W. Rathenau (1911-1989), who was Professor of Experimental Physics at the University of Amsterdam, director of the Philips Physics Laboratory in Eindhoven, and a member of the Scientific Advisory Council on Government Policy, successively. The Rathenau Instituut was named after him.