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AKADEMIE VAN WETENSCHAPPEN

SCIENCE AND SCHOLARSHIP CONNECT

STRATEGIC AGENDA FOR 2016-2020

SCIENCE AND SCHOLARSHIP CONNECT



2016 Royal Netherlands Academy of Arts and Sciences (KNAW)

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SCIENCE AND SCHOLARSHIP CONNECT

Strategic Agenda for 2016-2020

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SUMMARY: AIMS AND TARGETS FOR 2020

The Royal Netherlands Academy of Arts and Sciences (KNAW) plays three key roles. It unites outstanding Dutch scientists, scholars and artists in three societies – the Learned Society, the Young Academy, and the Society of Arts – and offers them a platform (forum role). It advises the Dutch Government on its science policy ('policy for science') and on the use of scientific evidence in policymaking ('science for policy') (advisory role). And it is responsible for 15 research institutes active in the humanities, the social sciences and the life sciences (research role). A number of these institutes manage sizeable and unique collections that serve as national and international research infrastructures. As national expertise centres, the Academy institutes complement Dutch universities and other knowledge-based organisations.

In the next five years, the Academy intends to reinforce the connections between scientific disciplines and science organisations, between science and society and, internally, between the three societies and its research institutes. The Young Academy and the Society of Arts are independent entities within the Academy and draw up their own strategic agendas. In view of the main theme of the present Strategic Agenda, a number of their aims have nevertheless been included.

It is impossible to make connections in science without considering diversity, both broad (the humanities, science and the social sciences) and deep (from basic to applied and practice-based research). Diversity – in gender, age, nationality and research domain – is also a crucial factor when assembling research teams.

The present Strategic Agenda for 2016-2020 identifies seven aims which it then breaks down into targets that the Academy must have achieved by 2020. Further details concerning the aims and targets will be set out in policy plans and agreements in the first half of 2016.

Forum, voice and conscience

Aim 1: optimise the Academy's performance by connecting its core activities

By 2020:

- the Academy will make a larger contribution to public discourse in science and the arts;
- the Academy will have helped create a stimulating research climate in the Netherlands;
- there will be inspirational interaction between:
 - the Academy's roles as a forum and advisory body
 - the three societies and the research institutes
 - the differing generations of scientists and scholars;
- the organisation, both management and support, will reflect the foregoing aims;
- the Academy will expressly involve younger researchers (PhDs and post-docs) in its activities.

Aim 2: serve as an ambassador and platform for Dutch scientists and scholars

By 2020:

- Dutch scientists and scholars will be more visible in the Netherlands and abroad in the media, as prize-winners, through their involvement in high-profile activities, and in other ways;
- the Academy will have updated its portfolio of scientific and scholarly prizes and funding to reflect changes in society and its own targets;
- the Academy will have tapped new sources of funding through a new policy of 'friendraising & fundraising'.

Aim 3: boost the Academy's role as an initiator, source of inspiration, partner and coordinator in science communication and education

By 2020:

- the Academy will also function as an online forum for scientists, scholars and members of the public who take an interest in science;
- policymakers and decision-makers in the world of Dutch politics and governance will find it easier to access scientific and scholarly knowledge;
- the Academy will play a pivotal role in connecting science and the public broadcasting system;
- the Academy will function as a guidepost for journalists and others who wish to seek out experts and reliable information in the scientific domain;
- primary and secondary education and teacher training will understand the value of and promote enquiry-based learning and learning by design for children and adolescents.

Aim 4: increase the impact of science on Dutch and European policy

By 2020:

- the Academy's advisory reports ('policy for science' and 'science for policy') and foresight studies will make a major contribution to national and European policy;
- the Academy will be more closely involved in the governance of key international organisations of science academies and will have identified clear-cut priorities concerning the focus of that involvement.

Research organisation

Aim 5: improve and position the Academy's research institutes as dynamic national organisations that complement Dutch universities

By 2020:

- all the institutes will be acknowledged top research organisations in their fields;
- the Academy's research institutes will serve as incubators and magnets for top Dutch and foreign researchers, with (partly as a result) diversity and flexibility as the hallmarks of its staff;
- the institutes will play a pivotal role in exploring important current and new subjects in consortia with other research institutions, including university

- research groups active in the Netherlands and abroad;
- the institutes will initiate broad alliances and serve as nodes in infrastructures;
 - all the institutes will actively pursue valorisation in the broadest sense of the word, i.e. creating value for society;
 - access to the institutes' collections will be optimised.

Aim 6: help reinforce national and international networks and research infrastructures

By 2020:

- the Academy will function as a catalyst for new networks and infrastructures;
- the Academy's institutes will act as the guardians of national and international infrastructures;
- the Academy will support its researchers as much as possible in applying for EU funding;
- the Academy will have contributed to developing and utilising the national and international research infrastructure (NWO and ESFRI respectively);
- scientific cooperation with China and Indonesia will be underpinned by the expertise and activities of the Academy institutes, where possible in line with EU policy.

Aim 7: utilise the potential of the Dutch National Research Agenda (NRA) in cooperation with the Knowledge Coalition partners

By 2020:

- the Academy institutes will be involved in implementing the NRA;
- the Academy will be helping to disseminate the knowledge generated by the NRA's questions and routes;
- the Academy will play a prominent role in bringing partners together and elaborating a number of collectively defined priorities, while acknowledging the importance of unfettered research across the board.

1 INTRODUCTION

VISION

The Academy is the forum, voice, and conscience of science and scholarship in the Netherlands. Its institutes carry out research and manage collections regarded as top-ranking both in the Netherlands and abroad. Its activities are based on the conviction that knowledge and creativity are vital to wellbeing and prosperity.

MISSION STATEMENT

As an independent entity, the Academy brings together human and other resources in order to make an informed and creative contribution to the advancement of society. It aims to be the source of inspirational, innovative insights, prospects and alliances. It promotes the quality and integrity of research. It wants its institutes to stand for excellence and to attract talented researchers.

The Academy stands for excellence and integrity in science. It is convinced that knowledge and creativity are vital to wellbeing and prosperity. It is the forum, voice, and conscience of science and scholarship in the Netherlands. The Academy's strength and independence spring from the stature of the three societies' members and of its institutes' researchers. The Academy does not represent individuals or organisations; it is one of the few science academies in the world to embrace virtually all scientific and scholarly disciplines – yet another source of strength.

Following an internal evaluation in 2014, the Academy made a series of significant improvements to its organisation in recent years. Nevertheless, in the next five years it will work hard to improve various points identified in the present Strategic Agenda. For example, its key roles are not as closely linked as they could be, and its support organisation is fragmented and does not operate as effectively as it might. More of the Learned Society's members could play a more active role and thus help the Academy achieve the targets identified in this plan. The institutes could improve their quality and in a number of cases cooperate more closely with one another and with third parties. There could also be closer coordination and cooperation between the international organisations in which the Academy has long been well represented. The Academy could further boost the impact of advisory reports – specifically, the influence of national advisory reports in the EU and the influence of international advisory reports in the Netherlands. In the years ahead, the Academy will expressly focus on involving younger researchers (PhDs and post-docs) in its activities.

The Academy wishes to advance inspirational, innovative insights and alliances in science, scholarship and art. It regards itself as an advocate of curiosity-driven research and budding creativity. Science and art are inextricably bound up with civilisation. Scientific and creative breakthroughs that make a difference can neither be predicted nor produced on command.

2 THE NETHERLANDS IN THE WORLD

In the decades ahead, science will play an increasingly prominent role world-wide in government, the business sector and civil society – a trend that has been under way for some time now. The influence of technology, and specifically ICT, will continue to rise, leading to both opportunities and dependencies. The geographical centres of gravity in research are shifting. Internationalisation will trigger more competition for talent. The countries that produce the best-qualified workers will also enjoy the greatest international success. International cooperation is essential to maintaining wellbeing and prosperity.

To deploy human and other resources strategically and sustainably in research and education, we must encourage talent and curiosity. Science is a long-term proposition that requires persistence. Society will increasingly turn to science for answers to complicated questions.

What these trends mean for the Netherlands

- To key into the global trends outlined above, the Netherlands must:
 - work on generating synergies and joining forces with others at national, European and global level;
 - work on generating synergies between the worlds of research, government, business, and civil society with a view to the future;
 - play a leading role in international efforts to resolve major scientific, socio-cultural and economic issues.

- The Dutch scientific community must inspire and challenge the next generations of Dutch and foreign students by offering them an environment of cutting-edge content and state-of-the-art facilities.
- Dutch researchers must be equipped to compete well and cooperate productively with partners in international scientific arenas. This will require a greater amount of stable, long-term funding from a variety of sources, both public and private.
- The Dutch scientific community must work towards achieving the most effective combination of monodisciplinary, interdisciplinary and transdisciplinary education and research.
- The Netherlands must work on building knowledge networks, infrastructures and centres of expertise and excellence that look beyond its borders and are accessible to all.
- The Netherlands must offer science and scientists strong and solid support (in politics, governance and society).

What these trends mean for the Academy

The Academy wishes to influence the foregoing areas, either directly or indirectly. It has identified seven aims in that connection, discussed in the subsequent sections.

3 FORUM, VOICE AND CONSCIENCE

3.1 Three societies: internal connections

AIM 1: OPTIMISE THE ACADEMY'S PERFORMANCE BY CONNECTING ITS CORE ACTIVITIES

By 2020:

- the Academy will make a larger contribution to public discourse in science and the arts;
- the Academy will have helped create a stimulating research climate in the Netherlands;
- there will be inspirational interaction between:
 - the Academy's roles as a forum and advisory body
 - the three societies and the research institutes
 - the differing generations of scientists and scholars;
- the organisation, both management and support, will reflect the fore-going aims;
- the Academy will expressly involve younger researchers (PhDs and post-docs) in its activities.

The Academy houses three societies: the Learned Society, with has more than 500 members; The Young Academy, with fifty members; and the Society of Arts, also with fifty¹ members. The members of the three societies are selected for

1 From April 2016.

their outstanding contribution to science and art, and they support the Academy as a forum and advisory body, both in form and content.

The Learned Society will be restructured in 2016. The purpose of this operation is threefold: to promote synergies between the Academy's forum and advisory roles; to strengthen the ties between the Academy Board and the members; and to streamline the organisation.²

The Academy's informal networks make it possible for new generations of scientists, scholars and artists to meet and inspire each other. The Faces of Science³ programme will offer PhD candidates and post-docs a network for knowledge-sharing and talent promotion. Another new network is Art Meets Science, which brings young researchers and artists together to collaborate on important societal and scientific themes. The members of the three societies and the directors of the Academy's research institutes nominate individuals for these networks.

Learned Society

The Learned Society, the Society of Arts and The Young Academy are responsible for fleshing out the Academy's role as a scientific forum, both separately and as a group. The meetings that they organise take different forms and have differing aims and target groups:

- Small-scale expert meetings at which members of the three societies and (depending on the topic) individuals representing Academy institutes debate senior government, business and political representatives. These meetings allow the Academy to help set societal, cultural and scientific agendas, so that the state of science figures more prominently in policymaking and decision-making.
- Small-scale expert meetings for researchers, for example to discuss new interdisciplinary and transdisciplinary research domains.
- Science conferences at which top researchers and artists consider a specific societal or scientific issue.
- Mini-symposia or theme meetings to inform a wider audience about the state of science and the arts.

The above meetings may ultimately lead to an advisory report or can be organised within the context of an advisory procedure. The Academy will be organising on-site meetings more frequently in the years ahead, for example at research institutes or universities.

² In line with the recommendations of the committee that evaluated the Academy in 2014.

³ See www.facesofscience.nl

The Young Academy and the Society of Arts draw up their own strategic agendas in line with their mandates, as explained below.

The Young Academy

The Young Academy is an independent forum of fifty young, ambitious scientists and scholars who are in the international vanguard in their fields. The selection of new members ensures that the membership remains well balanced in terms of scientific and scholarly disciplines; it also provides for gender and cultural diversity. That will remain the case in the years ahead.

The Young Academy nurtures its independent status within the Academy, which allows it every freedom to explore new activities and express its own opinions. Its working methods guarantee the active involvement of its members; because there is a regular stream of incoming and outgoing members, its plans and ideas are constantly evolving.

The Young Academy cooperates with the Learned Society when both stand to benefit, and operates independently when doing so is logical, for example owing to the nature of the relevant subject. It plans to call on researchers from the Academy's research institutes more than in the past to participate in its activities, for example by organising members' meetings at the institutes. It also intends to cooperate more with the Society of Arts by inviting the latter's members to give guest lectures and by undertaking joint projects, for example completing the matchmaking website (launched in 2015) for artists and scientists.

The Young Academy is developing a broad spectrum of activities, ranging from media appearances to educational events, and from advisory reports to meetings and theatrical performances. In the years ahead, it will focus on the following key themes: the precarious position of young scientists in the job market; diversity; the position of the (minor) humanities and theoretical natural sciences; and European science policy.

The Young Academy wishes to:

- promote exchanges and cooperation with all the Academy's sections;
- express its opinions in the media and with government and the political world;
- keep a critical eye on such developments as the implementation of the Dutch National Research Agenda and the redesign of the Netherlands Organisation for Scientific Research (NWO);
- continue to encourage discussion of research quality and the public

- relevance of science, for example by means of lectures and symposia;
- experiment with methods for encouraging children, adolescents and the general public to take an interest in and learn about science;
 - continue to generate ideas for interdisciplinary cooperation and issue an advisory report on interdisciplinarity in science education;
 - pay closer attention to internationalisation, for example through exchange programmes with other young academies and international organisations;
 - publish an 'expat guide' to help foreign researchers find their way in the Dutch world of academia.

Society of Arts

There are many similarities between the work of scientists and the work of artists. Originality, creativity, curiosity and an enquiring mind are crucial traits in both professions. Thanks to the founding of the Society of Arts in 2014, the Academy has returned to its origins by serving as the voice of science *and* the arts in the Netherlands.

The Society of Arts explores the interface between artistic and scientific imagination and encourages cross-fertilisation between them, in this way helping to restore the relationship between science and art. It also regards itself as an intermediary between the arts and government, politics and society, and in that sense differs from other organisations in the arts and culture sector. The Society of Arts advises on arts and culture policy. It also brings scientists and artists together to discuss and work on such socially relevant themes as education and enquiry-based learning, robotisation, migration and the European space, in some cases in cooperation with other cultural organisations.

Dutch artists are exceptionally active in the global arena. At international level, there has long been an awareness that cooperation between scientists and artists is not only stimulating but vitally important. The Society of Arts emulates organisations and institutes with which it intends to build closer relationships in the coming years. Cooperation between the arts and science is already proving beneficial in The Royal Society of Arts, the Akademie der Künste and other organisations.

Over the next five years, the Society of Arts will develop educational, advisory and cooperative activities and encourage public discourse. It will:

- highlight the importance of art in education;
- offer its advice on culture policy, starting (in 2017) with the status and role of expert opinions in the Dutch arts funding system;

- serve as the voice of the arts in public discourse;
- play a pivotal role in the existing artistic and cultural network by initiating and intensifying alliances between parties;
- collaborate with foreign academies and scientific and cultural institutions.

3.2 Researchers in the spotlight

AIM 2: SERVE AS AN AMBASSADOR AND PLATFORM FOR DUTCH SCIENTISTS AND SCHOLARS

By 2020:

- Dutch scientists and scholars will be more visible in the Netherlands and abroad in the media, as prize-winners, through their involvement in high-profile activities, and in other ways;
- the Academy will have updated its portfolio of scientific and scholarly prizes and funding to reflect changes in society and its own targets;
- the Academy will have tapped new sources of funding through a new policy of ‘friendraising & fundraising’.

The Academy has long been responsible for assessing and awarding prestigious prizes for excellence in science and scholarship. Its suitability for that role is undiminished. Science prizes are an important gauge of scientific and scholarly excellence and give top researchers and their teams the recognition they deserve. The Academy regularly evaluates its portfolio of science prizes and funding awards in the light of its organisational targets and changes in society. It naturally involves the relevant funding bodies in that evaluation.

The Academy will make a case within its own national and international networks for recognising outstanding Dutch researchers and offer them a platform, whether they work in the Netherlands or abroad. Standard bearers for science play an important role in generating public support. It also does justice to the nature of scientific research. After all, breakthroughs are almost always the result of teamwork, and teams are increasingly multidisciplinary in nature.

To support its activities, the Academy is developing a ‘friendraising & fundraising’ policy. Like its sister academies and other scientific institutions, the Academy intends to focus more on its status as a ‘society for public advancement’ and in that way generate extra funds for research and collections but also for initiatives that highlight the importance of scientific research.

3.3 Science communication and education

AIM 3: BOOST THE ACADEMY'S ROLE AS AN INITIATOR, SOURCE OF INSPIRATION, PARTNER AND COORDINATOR IN SCIENCE COMMUNICATION AND EDUCATION

By 2020:

- the Academy will also function as an online forum for scientists, scholars and members of the public who take an interest in science;
- policymakers and decision-makers in the world of Dutch politics and governance will find it easier to access scientific and scholarly knowledge;
- the Academy will play a pivotal role in connecting science and the public broadcasting system;
- the Academy will function as a guidepost for journalists and others who wish to seek out experts and reliable information in the scientific domain;
- the Academy will have promoted the role of enquiry-based learning and learning by design for children and adolescents.

The Academy's attempts to bolster and increase public support for science will continue unabated over the next five years. It is vital to interest people in science and research, for one thing to boost public confidence in them. A basic understanding of how science works, what it can do, and which sources of information are reliable is crucial to participating fully in a rapidly changing information society.

The members of the Learned Society and The Young Academy and the researchers affiliated with the Academy's institutes are the Academy's most important asset when it comes to science communication and education. In achieving its aims in this respect, the Academy furthermore draws as much as possible on its roles as a forum and advisory body. Examples include its mini-symposia on current topics of interest, the possibility of producing factsheets or visual material for teachers about these and similar meetings, and policy recommendations related to science and society. The activities of the three societies (listed in Section 3.1) naturally also contribute to achieving the targets identified here.

In the domain of science communication and education, the Academy cooperates closely with other organisations that operate nationwide, e.g. the Network

of European Museum Organisations (NEMO), NWO and the Association of Universities in the Netherlands (VSNU).

Online platform

The Academy also wishes to function as an online forum for scientists, scholars and members of the public who take an interest in science. The dialogue may concern the status of a specific scientific domain, policy for science or science for policy. This aim builds on the Academy's positive experience developing the Dutch National Research Agenda from the bottom up and building the Academy's online platform for discussion of the Government's *Vision for Science 2025* policy document.

Government and politics

In the next five years, the Academy will go beyond its role as a forum and advisory body by investigating how scientific expertise can play a more significant role in policymaking (science for policy). It will take on board lessons learned by science academies elsewhere.

The Parliament and Science project – a pilot that has been converted into structural collaboration pursuant to a September 2014 agreement – will be continued indefinitely by the relevant parties.⁴

Media

The Academy will work with the Dutch Public Broadcasting Organisation (NPO) to position itself as an intermediary between science and public broadcasting. It is the Academy's intention to collect and offer NPO ideas for programmes and to advise on producing them. The Academy remains a guidepost for journalists and representatives of civil society and other organisations who are seeking scientific expertise. It will optimise this role in the years ahead by mapping out the Academy's areas of expertise in a way that is useful to the media. Researchers who are interested in participating can make themselves available to the media as experts or commentators, or work behind the scenes to present another side of an argument. The Academy also finds it important to inform the media pro-actively, for example by organising master classes on current issues.

⁴ In addition to the Academy, they are The Young Academy, NWO, VSNU and the Dutch House of Representatives.

Education

As a logical extension of its activities of the past five years, the Academy will push universities to maintain and integrate the Science Nodes into their organisations.⁵ As a scientific forum, the Academy is especially interested in primary and secondary school teachers. In keeping with the Academy Education Prize, the Academy will work to encourage a scientific attitude in pupils.

3.4 Advisory role: influence in the Netherlands and Europe

AIM 4: INCREASE THE IMPACT OF SCIENCE ON DUTCH AND EUROPEAN POLICY

By 2020:

- the Academy's advisory reports ('policy for science' and 'science for policy') and foresight studies will make a major contribution to national and European policy;
- the Academy will be more closely involved in the governance of key international organisations of science academies and will have identified clear-cut priorities concerning the focus of that involvement.

The Academy is excellently positioned to serve as the voice of science in national and international forums. Its access to international networks is conducive to both the quality and relevance of its advisory reports. It is able to strike a good balance between policy for science and science for policy. In its advisory role, the Academy is able to connect science and society. It can draw inspiration for this from the Dutch National Research Agenda and the Government's top economic sectors policy.

The Academy's advisory councils and committees will maintain closer contact than in the past with alliances of science academies.⁶ In particular, the Academy will work more closely with European and worldwide alliances when advising

⁵ The Science Nodes bring together universities, teacher training programmes, primary and secondary schools and science museums to work on curricula that help raise awareness of science among teachers and pupils.

⁶ European Academies Science Advisory Council (EASAC); All European Academies (ALLEA); European Council of Academies of Applied Sciences, Technologies and Engineering (Euro-CASE); Federation of European Academies of Medicine (FEAM); Academia Europaea.

on science for policy. It will prioritise activities carried out under the banner of the European Commission's new Scientific Advice Mechanism (SAM). SAM concentrates the expertise of the various national science academies and their overarching European organisations.⁷

'Science for policy' addresses issues that key into the EU's need for advice, national research agendas and the Netherlands' strengths and priorities. Examples of advisory topics include the circular and stable economy, culture and identity, peace and security, health and nutrition, demographic issues, international law and Big Data. In the Academy's view, 'policy for science' should focus on developing and supporting a European science and innovation policy. Priorities are research quality and the need for unfettered research, including the necessary infrastructure and funding. Key themes include open access, open data and open science.

In line with its vision and mission, the Academy considers responsible data management and the prevention of research fraud key points of concern. It will make its voice heard on such matters, as an advisory body to the Dutch Government and co-founder of the National Board on Research Integrity (LOWI), but also by participating in national and international platforms, for example the World Conference on Research Integrity that will take place in Amsterdam in 2017. The Academy is developing a new code of conduct for research integrity in cooperation with NFU,⁸ NWO and VSNU. It will be published in 2017.

In the next five years, the Academy intends to devote itself explicitly to advising on university education. It will naturally coordinate its aims with other organisations and advisory bodies. The underlying principle is that the three main tasks of the university – education, research and valorisation – are interconnected. A university cannot do one without the other, and one of the most effective forms of valorisation is to supply the labour market with well-educated workers. Recent events have focused a disproportionate amount of attention on research quality. As a result, the reward systems and career prospects in research are now more highly developed than in the areas of valorisation and education. This skewed balance is detrimental to other forms of career advancement in the Dutch university system.

The Academy also wishes to devote more effort to exploring long-term trends in science, art and society. This would allow it to raise topics for scientific and

⁷ In late 2015, Academy Vice-President Pearl Dykstra was appointed to the High Level Group of Scientific Advisors, which, as part of SAM, advises the European Commission.

⁸ NFU: Netherlands Federation of University Medical Centres.

public debate that lie beyond the present-day political horizon. Foresight studies are not an obvious occupation for researchers, and that is why the Academy has joined various foresight networks in the Netherlands and abroad.

In assembling its advisory committees, the Academy consistently seeks out researchers at its institutes, members of The Young Academy and – on an incidental basis – the Society of Arts. Each time an advisory report is scheduled, a communication plan is also drawn up indicating how the Academy intends to build and maintain bridges to the parties addressed in the report. The Academy is naturally concerned to involve these parties as early as possible in the process, without compromising the report's impartiality.

The Academy intends to look more closely at the influence of international advisory reports in the Netherlands, and at the international component of advisory reports for the Dutch Government. When advisory reports are drafted in conjunction with alliances of European science academies, Dutch experts from within and outside the Academy are involved to ensure follow-up at national level. Key English-language advisory reports are translated into Dutch (at least in part) and distributed, where necessary accompanied by an explanation.

Given the growing importance of science worldwide, the Academy would do well to bring more focus to its international policy and to improve coordination in that respect. The Academy has chosen to be an active member of a small number of European and global academy alliances.

4 RESEARCH ORGANISATION

AIM 5: IMPROVE AND POSITION THE ACADEMY'S RESEARCH INSTITUTES AS DYNAMIC NATIONAL ORGANISATIONS THAT COMPLEMENT DUTCH UNIVERSITIES.

By 2020:

- all the institutes will be acknowledged top research organisations in their fields;
- the Academy's research institutes will serve as incubators and magnets for top Dutch and foreign researchers, with (partly as a result) diversity and flexibility as the hallmarks of its staff;
- the institutes will play a pivotal role in exploring important current and new subjects in consortia with other research institutions, including university research groups active in the Netherlands and abroad;
- the institutes will initiate broad alliances and serve as nodes in infrastructures;
- all the institutes will actively pursue valorisation in the broadest sense of the word, i.e. creating value for society;
- access to the institutes' collections will be optimised.

The Academy is responsible for 15 research institutes (listed in Appendix 1). Academy institutes derive their *raison d'être* not only from being international leaders in their fields, but also because they complement university research

groups in the Netherlands. Academy institutes are both agile and stable. They can quickly key into new trends, but can also set up research programmes that focus on the longer term. Their open collections (including data collections) and research facilities – along with their ability to maintain them in the long term – allow Academy institutes to make a significant contribution to the Dutch research infrastructure. In view of the growing importance of research infrastructures, the Academy intends to devote more effort to this over the next five years.

The Academy regularly subjects its portfolio of institutes to a critical examination. It looks not only at quality, but also at any necessary response to changes in the outside world. Its examination often leads to change. In recent years, the Academy has removed some institutes from its portfolio, merged others, and added or founded yet others. As announced in the Government's *Vision for Science 2025*, the Academy will re-examine its portfolio in the years ahead. The aim is to determine to what extent its institutes still have unique value in the Dutch research landscape.

The Academy will ensure that its institutes and the three societies are more mutually reinforcing. Together they constitute a network of knowledge, creativity and brainpower. The societies function as a 'quality panel' for the institutes, for example because their members are involved in the institutes' Scientific Committees. The institutes, in turn, bring their expertise and facilities to bear in the Academy's role as a forum, leading to new initiatives and generating fresh alliances.

4.1 Quality

The Academy wants its institutes to be acknowledged top research organisations in their fields. Every six years, each institute undergoes an evaluation by an independent international committee, which bases its work on the Standard Evaluation Protocol 2015-2021 (SEP). Three years after this external evaluation, the Academy conducts a mid-term review in which it examines what action the institute has taken on the evaluation committee's recommendations, and what the institute should be focusing on in the years ahead.

Starting in 2016, progress will be assessed on an annual basis in accordance with agreements concluded with each of the institutes. These agreements will cover both organisational targets (for example the targets defined in the present Strategic Agenda) and institute-specific targets, where possible taking the form of key performance indicators. A portion of the institutes' basic funding will depend on whether or not they have achieved the agreed targets.

4.2 Career policy and diversity

As an employer, the Academy bears some responsibility for researcher talent development, whether they are senior researchers, fellows, post-docs or PhD candidates. The institutes must become even more appealing to talented researchers, who should regard an affiliation with an Academy institute as a boost to their careers. The Academy aims to help its researchers acquire competencies relevant to careers in research, in business, or in the public or semi-public sector. At the heart of this policy is personalised talent development, i.e. helping each individual utilise and develop their specific talents.

The Academy will emphasise its role as a training ground for PhD candidates, with PhD training being regarded as the third stage of an academic education. The Academy considers its PhD candidates and post-docs as social capital in which it invests as a responsible public-sector organisation. After their time at the Academy, young researchers go on to pursue their careers within or outside academia. The Academy therefore feels responsible for contributing to their professional growth in terms of both content and competences.

One important issue is the sustainable career development of all Academy staff. Sustainable career development encompasses long-term employment participation within or beyond the organisation, with benefits for all concerned and regardless of age. It involves promoting healthy, safe, motivating, productive and instructive work, at every stage of a person's career and with an eye for diversity.

4.3 Cooperation

Successful research depends increasingly on large-scale alliances. That is why the Academy's institutes will be cooperating more closely with universities. The institutes will be doing more to initiate national alliances and seek out innovative approaches in promising interdisciplinary or transdisciplinary fields. Their cooperation will also extend to other knowledge-based institutions, civil society organisations, government agencies and businesses, in line with both the Dutch National Research Agenda and the Dutch Government's top economic sectors policy.

CASE STUDY: REVAMPING THE HUMANITIES

The institutes in the Academy's Humanities cluster will be joining forces in 2016. Interdisciplinary cooperation will lead to innovative research, which will naturally also benefit the Academy institutes outside the cluster. Young, talented researchers will be given the tools necessary to conduct ground-breaking basic research in the humanities for several years.

The digital humanities will be a priority within this alliance. Taking and staying in the lead in this area will require cooperation, coordination and synchronisation within and between disciplines. The cluster of humanities institutes in Amsterdam aim to develop into an international centre of expertise for digital data, digital research tools and infrastructure. To support them in their ambitions, the Academy is developing a national network of eight universities and innovative companies that will be called the Centre for Humanities and Technology Nederland (CHAT.NL).

The Academy encourages and facilitates public-private partnerships and has developed policies and rules in that regard for fresh spin-off activities. To support this aim, it will be grouping and coordinating its institutes' technology transfer activities and setting up a holding company. In addition, the Academy will work on setting up national, theme-based technology transfer offices to engage with the commercial market at supra-organisational level.

CASE STUDY: HUB

The Hubrecht Organoid Technology Foundation (HUB) was set up in 2013. The foundation uses the new organoid technology to develop 'personalised' drugs to treat cancer and other diseases, i.e. drugs tailored to the individual patient's specific situation. HUB is building on research conducted at the Hubrecht Institute in cooperation with UMC Utrecht, where researchers have succeeded in cultivating organoids from stem cells.

The Academy supports policy meant to reinforce the ties between science, government and business. Some of the research carried out at its life sciences institutes (and to a lesser extent its humanities and social sciences institutes) parallels issues being addressed by the designated top economic sectors. The Academy sees this as an opportunity to seek alliances in the top sectors Life Sciences & Health and Creative Industry.

4.4 Publications and data management

The Academy supports the Dutch Government's open access policy and the basic principle that public access to the results of publicly funded research should be unrestricted. At the same time, it is aware of the highly complex role that publication (especially in leading journals) plays in talent development and career planning. Citation scores still play a very significant role in the life sciences, for example. The Academy encourages open access by offering researchers two routes: the 'golden route' (researchers publish their results in open access journals using publishers' platforms) or the 'green route' (after mainstream publication, researchers upload a version of their article to a repository). By 2020, at least 80% of the publications originating in Academy institutes should be open access, published via one of these routes.

Collections of data obtained in publicly funded research are also considered a public good; the data are collected in the public interest and should therefore be accessible to all. The basic idea is to offer full open access. Access can be restricted only when dictated by considerations of privacy, public safety, intellectual property rights or other statutory rules. Research data and the relevant software are stored safely and sustainably in trusted digital repositories.

The Academy wishes to spearhead efforts to achieve the aims of the Dutch government concerning open access, open science and digital heritage. It does this by:

- ensuring sustainable open access to the research results and research data of its own institutes;
- joining NWO, TNO, VSNU and SURF (the collaborative ICT organisation for Dutch higher education and research) in exploring methods that provide affordable, secure open access to the growing volume of digital research data in the Netherlands;
- making a strong case for open access and open data with national and international bodies and on Dutch and international platforms;
- supporting initiatives to remove barriers to open access and open data.

In its National Strategy for Digital Heritage, the Ministry of Education, Culture and Science has chosen the Academy to serve as a node for the science sector. The Academy sees its task as that of contributing up-to-date scientific and scholarly knowledge, specifically concerning the digital humanities and research infrastructures. Wherever possible, the Academy will link its institutes' infrastructures and collections to infrastructures and heritage collections in other sectors.

4.5 Research networks and infrastructures

AIM 6: HELP REINFORCE NATIONAL AND INTERNATIONAL NETWORKS AND RESEARCH INFRASTRUCTURES

By 2020:

- the Academy will function as a catalyst for new networks and infrastructures;
- the Academy's institutes will act as the guardians of national and international infrastructures;
- the Academy will support its researchers as much as possible in applying for EU funding;
- the Academy will have contributed to developing and utilising the national and international research infrastructure (NWO and ESFRI respectively);
- scientific cooperation with China and Indonesia will be underpinned by the expertise and activities of the Academy institutes, where possible in line with EU policy.

Like economic production, scientific or scholarly production is a function of labour and capital. In science and scholarship, the point is to find smart ways of connecting people and resources. 'Resources' refers to money, but more importantly to the research infrastructure – laboratories, collections, and 'big science' equipment, including wind tunnels, MRI scanners, particle accelerators and genome banks. Beyond 'hard' infrastructure, networks – alliances of knowledge-based institutions, businesses and civil society organisations (depending on the subject) – are also important.

The Academy sees itself playing a role in this domain as an incubator and catalyst, as it is home to many collaborative projects. Using methods similar to those of the Large-scale Research Facilities Committee (2015), the Academy challenges scientists and scholars in its own ranks to work together to develop ideas for new research domains, networks and facilities, specifically involving interdisciplinary and transdisciplinary research. As an independent organisation, the Academy can propose and develop new and innovative research themes and then cooperate with NWO to build the necessary infrastructure. Its role as a forum and advisory body will support this aim where relevant.

European funding of Academy research

The Netherlands is one of the Member States that have benefitted most from the EU's research programmes. The Academy's research institutes are also increasingly turning to the European Research Council and the EU's Framework Programmes for external funding. The Academy will provide its researchers with better and more all-round support to maximise their chance of obtaining funding.

CASE STUDY: CLARIAH

In 2013, a consortium of organisations received 12 million euros from NWO for the CLARIAH project (Common Lab Research Infrastructure for the Arts and Humanities). The aim of CLARIAH is to interlink digital sources and data in the humanities and make the resulting infrastructure accessible. The Academy institutes played a leading role in setting up the consortium and continue to take the lead in the programme implementation phase. CLARIAH has now been incorporated into the DARIAH and CLARIN European research infrastructures. The CLARIAH consortium consists of more than forty parties. In addition to all the Dutch humanities research organisations, its members include university libraries, heritage institutions, public-sector organisations and businesses.

Collections and collections policy

Several of the Academy institutes have unique, world-renowned collections. They include the International Institute of Social History (IISG), the Meertens Institute and NIOD Institute for War, Holocaust and Genocide Studies in the humanities, and both the Fungal Biodiversity Centre (CBS) and the Netherlands Institute for Neuroscience in the life sciences. The datasets managed by Data Archiving and Networked Services (DANS) are also regarded as a collection. All these collections constitute a national and international research infrastructure that serves the needs not just of the institutes that house them but also of external researchers. Some parts of the collections have national or international heritage value. As has been the case in many libraries and archives, funding in recent decades has not kept pace with inflation, even though the institutes have had to invest heavily in technology. That is beginning to lead to difficulties in several cases. In the next five years, the institutes that manage collections expect to see a major increase in the amount of digital material and datasets. They will consequently be facing enormous challenges with regard to digital preservation, access and availability. Strategic personnel policy is important in

this respect, but a suitable financing model must also be identified with scope for investment. The Academy wants to ensure that the institutes managing collections more than measure up to Dutch university libraries and large-scale archives in terms of their expertise, management capacity and technology.

CASE STUDY: THE COLLECTION HELD BY THE FUNGAL BIODIVERSITY CENTRE (CBS)

The Fungal Biodiversity Centre manages the largest collection of living yeasts and fungi in the world. That collection permits innovative research and serves as an international standard for microbiologists, ecologists and geneticists. In addition to their scientific value, both the collection and the associated research are increasingly valuable to society and the economy, thanks to applications in medicine, agriculture, nutrition and other fields. One example is the use of enzymes to improve biofuels.

China and Indonesia

The Academy has played a pivotal role in recent decades in the Netherlands' scientific cooperation with China and Indonesia. In 2013, the Minister of Education, Culture and Science decided to suspend the relevant funding. Various Academy institutes will continue to cooperate with these countries on theme-driven research, where possible under the banner of the EU's Framework Programmes. The expertise, contacts and networks that have been developed down through the years will prove very useful in that regard.

4.6 Dutch National Research Agenda

AIM 7: UTILISE THE POTENTIAL OF THE DUTCH NATIONAL RESEARCH AGENDA (NRA) IN COOPERATION WITH THE KNOWLEDGE COALITION PARTNERS

By 2020:

- the Academy institutes will be involved in implementing the NRA;
- the Academy will be helping to disseminate the knowledge generated by the NRA's questions and routes;
- the Academy will play a prominent role in bringing partners together and elaborating a number of collectively defined priorities, while acknowledging the importance of unfettered research across the board.

In the course of 2015, the Academy devoted a lot of time and effort to developing the Dutch National Research Agenda. In the years ahead, it will encourage its institutes to incorporate and work on the NRA themes that parallel their own research while bearing in mind its role as an ambassador of unfettered research in the broadest sense. Where the Agenda builds on existing research programmes, such incorporation will be seamless, offering opportunities to reinforce existing and create new connections. The Agenda may also act as an important impetus for new research programmes.

The successful cooperation within the Knowledge Coalition⁹ will continue. The Academy will remain the linchpin of this group, in particular with regard to achieving the aims of the Dutch National Research Agenda. In 2016, the Coalition will work on the investment agenda needed to exploit the full potential of the NRA and to move closer to attaining the other goals identified in *Vision for Science 2025*, i.e. outstanding research, talent development, and relevance to society. In line with the Academy's advisory report *Ruimte voor ongebonden onderzoek* [Scope for unfettered research, July 2015], it is important for government to invest in curiosity-driven research, especially research initiatives undertaken by young research groups that could lead to new developments.

⁹ The Knowledge Coalition consists of NFWO (see footnote 9), Netherlands Organisation for Scientific Research (NWO), Netherlands Organisation for Applied Scientific Research (TNO) (also acting on behalf of the institutes for applied research, TO2), the Association of Universities of Applied Sciences, employers' federation VNO-NCW (also acting on behalf of MKB Nederland) and the Association of Universities in the Netherlands (VSNU).

5 FOLLOW-UP STEPS

The aims and targets defined in this Strategic Agenda will be embedded in policy over the next few months, and where relevant spelled out more specifically in agreements. A policy document will elaborate on the aims related to two of the Academy's three key roles, i.e. its roles as a forum and as an advisory body. That document will look specifically at how to adapt the Academy's Learned Society and at its administrative structure. It will also consider the issue of internationalisation and how to boost the Academy's advisory role. In addition, it will discuss the aims of The Young Academy and the Society of Arts. The Academy will draw up agreements with the institutes laying down the arrangements made with each one individually. The arrangements will address the Academy's organisational targets and the institute's targets.

To achieve the aims defined in this Strategic Agenda, changes will also be made to the Academy Bureau in order to promote closer relationships between the various departments. Quality and operational efficiency improvements will be introduced across the board, i.e. within the Bureau and at the institutes. The financial resources that are freed up as a result will be used to support and improve the primary processes.

APPENDIX 1:

LIST OF ACADEMY INSTITUTES

Humanities and Social Sciences

- Data Archiving & Networked Services (DANS)
- Fryske Academy (FA)
- Huygens ING
- International Institute of Social History (IISG)
- Royal Netherlands Institute of Southeast Asian and Caribbean Studies (KITLV)
- Meertens Institute
- NIOD Institute for War, Holocaust and Genocide Studies
- Netherlands Interdisciplinary Demographic Institute (NIDI)
- Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS)

Life Sciences

- Fungal Biodiversity Centre (CBS)
- Hubrecht Institute for Developmental Biology and Stem Cell Research
- Netherlands Institute for Neuroscience
- Netherlands Institute of Ecology (NIOO)
- Spinoza Centre for Neuroimaging

Public debate

- Rathenau Institute