



Ethics assessment and guidance in different types of organisations

National Science Academies and Academic & Professional Organisations

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Annex 3.d

Ethical Assessment of Research and Innovation: A Comparative Analysis of Practices and Institutions in the EU and selected other countries

Deliverable 1.1

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1 Introduction

The aim of this report is to analyse and compare how ethics assessment and ethical guidance of research and innovation is performed by national science academies and academic and professional organisations in the European Union, the United States and China. The report is based on online and offline documentation, previous published reports, and interviews with representatives of organisations in ten different countries and at the EU and global international level. Eight representative European countries were singled out for in-depth study, including seven EU members and one candidate for EU membership: Austria, France, Germany, the Netherlands, Poland, Serbia (EU candidate country), Spain and the United Kingdom. This report investigates how national science academies and academic and professional organisations are organised in these countries, in China, the US and, if applicable, at the EU and global international level. It considers the situation in other EU member states and candidate and studies how organisations of this type are institutionally embedded, how they perform ethics assessment and guidance and with what aims, and what are the perceived strengths and weaknesses of their participation in ethics assessment and guidance.

Ethics assessment, in the context of this report, is any kind of assessment, evaluation, review, appraisal or valuation of research or innovation that makes use of ethical principles and criteria. Ethical principles are criteria that aim to determine whether certain actions or developments are right or wrong. They define individual rights such as the rights to freedom and privacy, and include principles of justice and principles that say that harms to individuals and society should be avoided and benefits for them should be promoted. Ethical guidance is different from ethics assessment in that it does not concern an evaluation of practices and products of research and innovation that have already occurred, but rather presents rules, codes, and recommendations to which future scientific practices, innovation practices, and developments in science and technology are expected or recommended to adhere.

The traditional aims of science academies have been discussing scientific values and promoting a positive role of science in society, which makes them well placed to address the questions of research ethics. Because of their representative and influential position within the scientific and wider community the academies are most suited for an advisory and standard-setting role. Academic and professional organisations have a similar representative role that allows them to independently design ethical guidelines for their members.

This report will explore the aims and values promoted by science academies and other academic organisations, as well as their institutional structures and general contribution to the practices of ethics assessment. This report begins with brief description of institutional characteristics of national science academies and academic and professional organisations. Section 3 discusses the aims of ethics assessment and ethical guidance, Sections 4 and 5 present institutional setups and procedures for ethics assessment, and Section 6 discusses ethical principles upheld and ethical issues addressed by national science academies and academic and professional organisations. The final section gives an account of problems faced by ethics assessors at national science academies and academic and professional organisations and possible future developments. The Annex provides detailed information on specific surveyed institutions.

2 National Science Academies and Academic and Professional Organisations: Basic Characteristics and Distribution

2.1 National Science Academies

Scientific academies are associations of culturally, scientifically or politically influential people, founded as platforms for debate on socially important questions. European Academies Science Advisory Council lists as its members the 27 national science academies and 2 European academies¹. Scientific academies carry different roles. While some academies were created to preserve the national language and culture, others were designed to support science (e.g. the different roles of Académie Française² and the Académie des sciences³ in France).

Science academies – associations of distinguished scholars or scientist – were established for the purposes of tackling general questions of scientific endeavour and promoting scientific values within society. They function as learned societies, uniting the most distinguished scientists from different disciplines. New members are generally elected on the basis of scientific excellence. The scope of an academy can be defined geo-politically or according to the range of scientific fields it represents. Thus, academies are either:

- Regional or national: e.g., among several regional academies in Germany (in Göttingen, Hamburg, Heidelberg etc.), Leopoldina⁴ was appointed as the German National Academy of Sciences in 2008;
- Field-specific or general: e.g., in United Kingdom, there are the Royal Society⁵ (all areas of sciences), the British Academy for the Humanities and Social Sciences⁶, the Royal Academy of Arts⁷, the Royal Academy of Engineering⁸ and the Academy of Medical Sciences⁹, while in Slovenia, there is the joint Slovenian Academy of Sciences and Arts¹⁰.

Most science academies suggest their primary aim is the advancement of science combined with its integration in society. They seek to promote domestic scientific research by shaping or influencing national research policies, providing a forum for interdisciplinary scientific debates, publishing research results and conferring awards for outstanding achievements. In many countries, national academies include research institutes (e.g. the Netherlands, Austria, Czech Republic, Poland) or distribute research grants and scholarships. Leopoldina's "Mission Statement" states:

- It is dedicated to the advancement of science for the benefit of humankind and to the goal of shaping a better future.

¹ <http://www.easac.eu/home/member-academies.html>

² www.academie-francaise.fr

³ www.academie-sciences.fr/

⁴ <http://www.leopoldina.org/>

⁵ <https://royalsociety.org>

⁶ www.britac.ac.uk/

⁷ <https://www.royalacademy.org.uk>

⁸ www.raeng.org.uk

⁹ www.acmedsci.ac.uk

¹⁰ www.sazu.si

- it represents the German scientific community in international committees and speaks out on social and political questions, providing a nonpartisan, factual framework for discussion
- Under the auspices of the Leopoldina, interdisciplinary groups of experts publish policy-guiding statements on issues of current interest.
- It promotes scientific and public debate, supports young scientists, confers awards for scientific achievements, conducts research projects, and campaigns for the human rights of persecuted scientists.¹¹

As representatives of the scientific and intellectual community in society, academies may take on an advisory role for governments, providing independent expertise on science-related issues to decision makers. Academies often intervene in public debates by releasing statements on current issues¹². However, their main focus is on initiating discussions on the role of science in society (e.g. freedom and responsibility of science), and advocating that the advancement of science is beneficial to the future of humanity. Internally, for the scientific community, they seek to achieve this goal by raising awareness of social and ethical responsibility of science. Externally, their efforts are directed at promoting a positive public image of science and popularising its achievements. For example, The Rathenau Institute of the Royal Netherlands Academy of Arts and Sciences (KNAW)¹³ studies developments in science and technology, analyses their potential impact on society and policy, and promotes a dialogue on issues and dilemmas in science and technology. Its mission is:

1. Studying the social impact of science and technology:

This part of the Institute's activity focuses on Technology Assessment (TA), therefore on analysis of technological and scientific developments (new emerging technologies, as well as well-established technologies) and their impact on individuals and society, including new opportunities, risks, all kinds of possible societal implications (e.g. ethical, religious, social, economic, legal).¹⁴

2. Describing the Dutch science system:

Describing the Dutch science system:

The second part of the Institute's activity is Science System Assessment (SciSA) which focuses on the dynamics of science and technology and the organization of the science system.¹⁵

Acting as representatives of national research in the wider scientific community, the national academies also have an important role to play in international scientific cooperation. To this end, national academies have formed international associations, such as InterAcademy Panel: The Global Network of Science Academies (IAP)¹⁶, InterAcademy Council (IAC)¹⁷, European Academies Science Advisory Council (EASAC)¹⁸, All European Academies (ALLEA)¹⁹ and

¹¹ <http://www.leopoldina.org/en/about-us/about-the-leopoldina/leopoldina-mission-statement/>

¹² Emerging issues, such as synthetic biology, nanotechnology, robotics, etc.

¹³ <https://www.knaw.nl/en/about-us>

¹⁴ www.rathenau.nl/en/who-we-are/mission/technology-assessment.html

¹⁵ www.rathenau.nl/en/who-we-are/mission/science-system-assessment.html

¹⁶ www.interacademies.net

¹⁷ www.interacademycouncil.net

¹⁸ <http://www.easac.eu>

the Federation of European Academies of Medicine (FEAM)²⁰, among others. These organisations allow the academies to collaborate on common agendas, and pursue their aims by providing advice and influencing policy-makers at the international level. The European Academies Science Advisory Council (EASAC) website states that “the academies work together to provide independent, expert, evidence-based advice about the scientific aspects of public policy to those who make or influence policy within the European institutions.”²¹

Unlike national science academies in EU, which are independent public institutions, the U.S. National Academies²² (NA) of the U.S. do not receive direct appropriations from the federal government, but do receive funding for individual activities. The National Academy of Science²³, the National Academy of Engineering²⁴, and the Institute of Medicine and the National Research Council²⁵, who serve collectively as the scientific National Academies (NA), also receive funding from other sources, including the states, industry and foundations.²⁶

2.2 Academic and Professional Organisations

Academic organisations are voluntary and non-profit organisations, open to researchers working in a specific discipline. The aim of such associations is first and foremost to advance and promote a specific discipline while also seeking to put their discipline in the service of the public good. Professional associations (or professional bodies or professional organisations) have similar aims while also concentrating on the professional interests and working conditions of its members.

Most professional associations and societies connect with others through national and international bodies, forming a larger international body (such as the IEEE - The Institute of Electrical and Electronics Engineers²⁷, ACM - Association for Computing Machinery²⁸, or the EPBS - European Association for Professions in Biomedical Science²⁹). These umbrella organisations define common goals, steer professional initiatives, regulate fields and propose common codes of conduct or ethical guidelines. EU/international associations provide a voice to a large part of academic research and teaching community in Europe and beyond. As large professional bodies, they also have a say in matters of national, regional and international policies. They promote, encourage and support various research areas in a variety of ways, with an emphasis on various programmes of scientific exchange and cooperation between scientists working in different countries, and on promotion of the training of early-career scientists.

¹⁹ www.allea.org

²⁰ www.feam-site.eu

²¹ <http://www.easac.eu/about-easac/what-is-easac.html>

²² <http://www.nationalacademies.org>

²³ www.nasonline.org

²⁴ www.nae.edu

²⁵ www.nationalacademies.org/nrc

²⁶ <http://www.nationalacademies.org/about/whoweare/index.html>

²⁷ www.ieee.org

²⁸ www.acm.org

²⁹ www.epbs.net

The World Medical Association states its mission is “to serve humanity by endeavoring to achieve the highest international standards in Medical Education, Medical Science, Medical Art and Medical Ethics, and Health Care for all people in the world”³⁰.

The German Sociological Association (GSA) is

... a non-profit organisation, which has as its aims the articulation of sociological problems, the furtherance of scholarly communication amongst its members, and the participation in the dissemination and deepening of sociological knowledge. The [GSA] participates in the clarification of questions, having to do with sociology as a discipline, as well as with the study of this discipline. [...] The members have formulated for themselves a code of ethics. This code provides guidelines for more integrity within the sociological profession.³¹

The European Society for Paediatric Endocrinology (ESPE) is

... a non-profit international organisation aiming to promote the highest levels of knowledge, research, education and clinical practice of paediatric endocrinology and metabolism throughout the world. ... The Society is dedicated to serve its members and the international scientific community. It is also actively involved in promoting the interests of the general public and in advising on European health policy in the area of paediatric endocrinology. ESPE is committed to welcoming and supporting colleagues and young paediatric endocrinologists from around the world, as well as establishing close relationships with other Scientific Societies.³²

Verein Deutscher Ingenieure (VDI; Association of German Engineers), one of the largest technical and scientific associations in Europe, provides the following statement of responsibilities and aims:

- Continued development of electrotechnology, electronics, information technology and technologies based on these;
- Support of the use of electrotechnology and electronics in mechanical engineering, in manufacturing and process automation, transport and medical technology, etc;
- Promotion of the national and international transfer of technical knowledge;
- Further education and career development by a varied programme of congresses, technical symposia and seminars;
- Participation in political decision-making on education and research;
- Promotion of scientific knowledge and training.³³

The goals of academic and professional organisations are achieved by a variety of activities, aimed at:

- Developing the discipline:
 - Organising conferences and congresses
 - Publishing scientific journals
 - Establishing technological standards
 - Awarding prizes in recognition of scientific distinction

³⁰ <http://www.wma.net/en/60about/index.html>

³¹ <http://www.soziologie.de/en/gsa/about-the-gsa.html>

³² <http://www.eurospe.org>

³³ <http://www.vdi.de>

- Providing scientific exchange and support for career development, networking, education and training
- Facilitating communication and education across various fields
- Securing conditions for the development of the discipline:
 - Advocating for research funding
 - Advising policy-makers
 - Supporting science in disadvantaged economies and action on women in science
 - Enhancing national scientific meetings
- Setting high professional standards:
 - Promoting best practices and research ethics
 - Practice control or oversight of the legitimate practice of particular profession,
 - Act as controlling/regulating body issuing standards, qualifications, certifications and licenses
- Protecting interests of its members:
 - Providing networking and mobility opportunities
 - Employment search services
 - Career consulting
 - Training programmes
 - Aiding participation of early-career scientists at these events (through travel grants)
 - Providing various types of Fellowships for pre-and post-doctoral scientists to facilitate research, training and mobility
 - Providing updates, news, and events and job listings, etc.

3 Ethics Assessment by National Science Academies and Academic and Professional Organisations: Prevalence and Aims

3.1 National Science Academies

In many countries, e.g. in the Netherlands and UK, national science academies play an influential role in designing national science policies and research programmes³⁴. Their advisory work (on their own initiative or by request from other stakeholders) also includes statements on current scientific developments, special reports on specific issues and foresight studies on new technologies. Science academies' commitment to ethical orientation of scientific advancement, its social and environmental responsibility and its contribution to sustainable development are reflected in all of these activities. Furthermore, academies also promote ethically responsible science by providing a platform for professional and public debate on the ethical aspects of research (see below and Sections 4.1 and 5.1).

Another dimension of ethics assessment by science academies concerns the problems of scientific integrity and misconduct of researchers, which is addressed by the academies' codes of conduct and good practice guidelines (Sections 4.1 and 5.1). Academies that include

³⁴ Additional details on individual countries' science-policy making are also provided by the European Commission's ERAWATCH <http://erawatch.jrc.ec.europa.eu/erawatch/opencms/index.html>

research institutes use these documents for assessment of their own employees. However, it is common for academies and especially so for their international associations to promote scientific integrity on a wider, national or international scale.

While academies are not usually involved in ethics assessment of individual research projects (apart from ensuring compliance with standards and regulations in cases where academies include research institutes), in some cases they handle cases of research misconduct (e.g. National Board for Research Integrity (LOWI)³⁵ in the Netherlands).

The current emphasis on research ethics coincides with the traditional aim of science academies to correlate the advancement of science with the prosperity of society. Their specific goals concerning ethical issues in research include:

- Initiating debate and providing a platform for reflection on ethical assessment in science;
- Using their advisory role and influence on governments and research institutions to raise awareness on these issues, providing advice and coordinating solutions;
- Addressing current ethical dilemmas in science;
- Implementing ethical guidelines in research policies;
- Providing ethics codes for researchers;
- Modelling procedures for ethics assessment and dealing with cases of misconduct.

The European Science Foundation's (ESF) policy briefing "Good scientific practice in research and scholarship" recommends national academies should

- Draw up national codes of good scientific practice in research and scholarship;
- Initiate discussions on the most appropriate national approach to procedures for investigating allegations of scientific misconduct.³⁶

Implementation of high ethical standards is also high on ALLEA's agenda. One such example is ALLEA's *Memorandum on Scientific Integrity*³⁷. Its Permanent Working Group on Science and Ethics (PWGSE) issues annual reports. In "ALLEA Annual Report" for 2003, Pieter J. D. Drenth states that the role of international associations of academies is to:

- Place the issue of misconduct on the agenda;
- Provide individual national academies with information and advice,
- Co-ordinate national activities internationally with a view to alignment around common principles (although not disregarding differences of opinions and legal traditions between states), and
- Deal with misconduct in international research projects.³⁸

³⁵ <https://www.knaw.nl/en/topics/ethiek/landelijk-orgaan-wetenschappelijke-integriteit-lowi>.

³⁶ European Science Foundation, *Good scientific practice in research and scholarship: ESF Policy Briefing*, December 2000

³⁷ ALLEA, *Memorandum on Scientific Integrity*, 2003.

³⁸ Drenth, Pieter J. D., "Scientific Integrity and Social Responsibility: The Role of Academies of Sciences", *ALLEA Annual Report*, ALLEA, Amsterdam, 2003, pp. 17-28 [p. 18].

3.2 Academic and Professional Organisations

The aim of ethics-related activities of academic and professional organisations is to consolidate ethical standards within a discipline at the national or the international level and to put them into effect as widely as possible. This is specially the case for the international umbrella organisations that have played a major role in establishing the fundamental ethical guidelines that served as the basis for the development of ethics assessment procedures as well as legislation. Significant example is the World Medical Associations' Declaration of Helsinki, which remains the cornerstone of research ethics in biomedical sciences.³⁹

In fields where ethics assessment is already institutionalised to a significant degree, the role of associations is to review their guidelines according to the latest scientific developments and motivate their member institutions to update their assessment procedures and regulations.⁴⁰ In order to do so, associations encourage professional and public debate on ethical topics. For example, European Countries Biology Association (ECBA) states:

ECBA needs to adapt to a changing environment; it will do so by creating a vision of how it sees Biology in Europe, its mission and role(s) and its forward action plans.

Declaration subscribing biologists agree to abide by the European Professional Biologist Code of Conduct and ethics that, in order to serve European society and to promote its values, they shall:

- Conduct honourably so as to uphold the dignity and reputation of the biological profession;
- Keep their knowledge up to date, so that they are competent to practise as a professional biologist;
- Apply the highest scientific principles to their professional activities, and take into account the long term effect of those activities on the environment;
- Value and respect all living organisms and systems.⁴¹

An example of smaller associations aligning codes of ethics (COE) along the lines of more prominent professional organisations, such as the Association for Computing Machinery (ACM), is SI – The Swiss Informatics Society:

The "Ethics" working group has analysed the ethical guidelines and professional guidelines of numerous computer science organisations and, starting from the "Code of Ethics and Professional Conduct" of the ACM, drafted a proposal adapted to Swiss conditions. [...] For over thirty years ethics standards for computer professionals have been discussed and drawn up in many countries. It has become apparent that there cannot be a globally standardised code of ethics owing to cultural differences and local situations. The basic precepts of the Swiss Informatics society (SI) are modelled on the Code of Ethics and Professional Conduct of the

³⁹ <http://www.wma.net/en/30publications/10policies/b3/>

⁴⁰ ICT Professional Societies in Europe. Role and Impact of Professional and Scientific Societies in ICT Research, Education and Innovation (SMART 2009/0061).

http://ec.europa.eu/information_society/newsroom/cf/itemdetail.cfm?item_id=7222

⁴¹ <http://www.ecba.org>

Association for Computing Machinery) (ACM) approved in 1992. We have expanded on them taking into account the Swiss point of view.⁴²

In other fields, where ethics assessment is less institutionalised, e.g. social sciences, scientific associations have a big role to play in standard setting and guidance. International federations, such as the International Sociological Association (ISA)⁴³, propose their codes of conduct and state that “membership [...] commits members to adhere to it”.⁴⁴ The European Federation of Psychologists’ Associations (EFPA) proposed “a meta-code on ethics, a common framework for the ethical codes in the member-countries”.⁴⁵ National organisations can also have a major international impact: the UK’s Social Research Association (SRA) was one of the key partners in European Commission’s RESPECT project⁴⁶ and consequentially in the development of the European “Code of Practice for Socio-Economic Research”.⁴⁷

The SRA suggests “good ethical practice in social research is vital to:

- Protect research subjects,
- Ensure high quality research,
- Reassure funders,
- Help to maintain the good reputation of our sector, and
- Comply with legislation.⁴⁸

Academic and professional organisations also play an important role in controversial areas where consensus on good practice is not yet achieved. Research on health risks and nutritional assessment studies of genetically modified food is currently one such area. There is no uniform agreement in science due to limited research trials (the independent research has been hindered until recently due to the industry’s restrictive end-user agreements on the use of seeds⁴⁹), nor is there an international agreement on policies and regulations regarding genetically modified food,⁵⁰ not even between the countries within EU. Furthermore, a recent study on the conflicts of interest between research and the corporate sphere on this issue has shown strong correlation between an researcher’s affiliation to industry and the outcome of research study.⁵¹ In such cases, international associations and societies can play an important role by engaging in the discussion on particular issues from a professional or scientific

⁴² http://www.s-i.ch/fileadmin/daten/si/SI_Code_of_Ethik_V1.pdf

⁴³ <http://www.isa-sociology.org/>

⁴⁴ http://www.isa-sociology.org/about/isa_code_of_ethics.htm

⁴⁵ <http://ethics.efpa.eu/board-of-ethics/history/>

⁴⁶ <http://www.respectproject.org/partners/index.php>

⁴⁷ http://www.respectproject.org/code/respect_code.pdf

⁴⁸ <http://the-sra.org.uk/research-ethics/ethics-guidelines/>

⁴⁹ See, for example, Waltz, Emily, “Monsanto relaxes restrictions on sharing seeds for research”, *Nature Biotechnology*, Vol. 28, No. 10, October 2010, p. 996; Nicolina A., et al. “An overview of the last 10 years of genetically engineered crop safety research”, *Critical Reviews in Biotechnology*, Early Online, September 2013, pp. 1-12.

⁵⁰ See Gaskell G., et al. *Europeans and Biotechnology in 2010: Winds of change?* A report to the European Commission’s Directorate-General for Research European Commission Directorate-General for Research 2010 Science in Society and Food, Agriculture & Fisheries, & Biotechnology, EUR 24537 EN, October 2010.

⁵¹ See Diels, Johan; Mário Cunha, Célia Manaia, Bernardo Sabugosa-Madeira, Margarida Silva, “Association of financial or professional conflict of interest to research outcomes on health risks or nutritional assessment studies of genetically modified products”, *Food Policy*, Vol.36, No. 2, 2011, pp. 197–203.

perspective. Such a perspective might not align with national (or regional) policies, as these are sometimes politically biased, and under pressure from corporations.

The British Medical Association's (BMA) urge for a moratorium on GM crops is a good example of associations' roles in general discussion and contributions to policy making.

The BMA "believes that any conclusion upon the safety of introducing genetically modified materials into the UK is premature as there is insufficient evidence to inform the decision making process at present".⁵²

The main contribution of academic and professional organisations to the process of ethics assessment is establishing fundamental values, principles and guidelines. Their role is similar to those of science academies, although the scope of their concern is generally limited to a specific discipline. The organisations may:

- Issue declarations, ethical codes, guidelines and best practices,
- Issue statements in response to new scientific developments,
- Comment on new regulations and legislations proposals,
- Include acceptance of ethical codes in terms of membership and consider ethical aspects when defining and approving operating procedures or providing peer-reviews, accreditations or licenses,
- Provide consultancy and guidance on ethical issues to members.

4 Institutional Setup of Ethics Assessment

4.1 National Science Academies

National academies are mostly state-funded and governed according to the law, or their own statutes. New members are recruited by nominations from current members. The governing body (a senate, council or board) and the director are elected from amongst the members. Committees are formed to address specific tasks.

To address ethical issues in science, academies typically form special committees or working groups, such as Permanent Working Group on Science and Ethics (PWGSE) at ALLEA⁵³ or IAP-IAC Committee on Research Integrity⁵⁴. Members of such committees or working groups may be elected academy members and may also include invited representatives of other relevant stakeholders (e.g. universities, research institutions, funding agencies). These bodies are generally designed to: promote ethics in science by initiating professional and public debate, raising awareness etc.; address, form opinions and issue statements on ethical issues related to research and innovation; and, inform and advise research institutions and policy makers on ethical issues regarding science. Following are some examples.

The Science and Ethics Commission at Leopoldina, Germany:

⁵² <http://foodsafety.k-state.edu/en/news-details.php?a=3&c=29&sc=220&id=36021>; <http://bma.org.uk/>

⁵³ <http://www.allea.org/Pages/ALL/19/228.bGFuZz1FTkc.html>

⁵⁴ <http://www.interacademies.net/file.aspx?id=19789>

Just like any other kind of human activity, the way scientists conduct research raises ethical questions. These pertain to the standards of good scientific practice and to the opportunities and risks that arise from the public dissemination and technical application of new research findings. The commission uses its expertise to inform the way it addresses urgent questions concerning scientific activities.⁵⁵

The Advisory Committee on Integrity, Policy and Trust in Science at KNAW (Netherlands):

As the conscience of science and scholarship in the Netherlands, the Academy is deeply concerned about the ethical aspects of research. It expresses that concern by offering advice, organising meetings and participating in public debates.⁵⁶

The Scientific Integrity Commission at Swiss Academies of Arts and Sciences:

[...] follows national and international developments and takes position on general questions related to scientific integrity. The commission advises research institutions, research promoting institutions and political authorities on fundamental questions.⁵⁷

The Commission for Research Integrity at the Austrian Academy of Sciences (ÖAW) states:

By founding this commission the ÖAW seeks to contribute to the promotion of the culture of ethics in science. The Commission for Research Integrity shall review and evaluate scientific questions susceptible to arise both inside and outside the ÖAW and shall formulate its opinion on these issues.⁵⁸

Some science academies have more than an advisory role. For example, the French Academy of Medicine (l'Académie de Médecine)⁵⁹ is a research association with legal standing under public law, with special status placed under the protection of the President of the Republic. Its mission is to respond, on a non-profit basis, to the requests of the Government on any matter relating to public health and take care of all study and research subjects that can contribute to advances in the field. The National Academy of Medicine is independent from the government and its decisions take effect without prior authorisation. The French Academy of Medicine has several permanent commissions and several working groups. Among these permanent commissions, the Academy has the Commission "Ethique et Droit"⁶⁰ (Ethics and Law Commission) which is composed of about 20 permanent members, several corresponding members and a couple of invited members. It carries out the reflection on the issues of ethics, law and health practices and research. The reports and the opinions of the French National Academy of Medicine are submitted to the President of the Republic, the French Government, as well as are made available for the public.

The National Committee for Bioethics, part of the Serbian Academy of Science and Arts (Srpska akademija nauka i umetnosti-SANU)⁶¹, was founded as a result of cooperation

⁵⁵ <http://www.leopoldina.org/en/policy-advice/standing-committees/science-and-ethics/>

⁵⁶ <https://www.knaw.nl/en/topics/ethiek/wetenschappelijke-integriteit>

⁵⁷ <http://swiss-academies.ch/en/index/Schwerpunktthemen/Wissenschaftliche-Integritaet.html>

⁵⁸ <http://www.oeaw.ac.at/english/about/beratungsgremien/kommission-fuer-wissenschaftsethik.html>

⁵⁹ www.academie-medecine.fr

⁶⁰ www.academie-medecine.fr/commissions

⁶¹ <https://www.sanu.ac.rs/English/Index.aspx>

between SANU and Commission for Cooperation with the UNESCO of the Ministry of Foreign Affairs of Serbia in 2003. The Committee is performing its function independently with respect to government authorities, scientific research organisations, researchers, medical officers and other individuals and institutions, in accordance with the UNESCO Charter and the present Rules of Order⁶². The composition and competence of the Committee are determined in accordance with the regulations, conventions and international declarations. The Committee supports all activities focused on enhancing general level of public awareness and general and private type of decisions related to bioethics. It cooperates with international organisations in the area of bioethics, as well as national and regional bioethics associations and committees.

The institutional setup of Chinese science academies and academic and professional organisations is somewhat different compared to their European counterparts, particularly in terms of their independence. Chinese public institutions are directly affiliated with the government and almost all Chinese higher education institutions are under the central or local government. Thus, Chinese government plays a very important role in the area of public research and innovation. The Science Ethics Committee⁶³ of the Chinese Academy of Sciences⁶⁴ (CAS), established in 1996, is responsible for supervising and administering the academic ethics of researchers and scientists, by which it works on building research ethics in China's science community.⁶⁵ In the past years, it has hosted or sponsored some research programs on the moral and ethical principles regarding research. The Committee drafted the *Guiding Principles Concerning the Research and Development of Transgenic and Nano Technologies*⁶⁶. Similarly, the Science Ethics Committee⁶⁷ of the Chinese Academy of Engineering⁶⁸ (CAE), established in 1997, guides local committees of CAE departments in dealing with science and academic issues concerning ethics, investigating cases of ethical problems and giving opinions, and so forth. The Committee has issued two regulations conducting the science ethics of academicians and scholars in 1998 and 2012.⁶⁹ Both academies operate under the State Council of Chinese government.

The member U.S. National Academies (NA), the National Academy of Engineering (NAE) is a private, independent, non-profit institution that provides engineering leadership in service to the nation. The mission of the National Academy of Engineering is to advance the well-being of the nation by promoting a vibrant engineering profession and by marshalling the expertise and insights of eminent engineers to provide independent advice to the federal government on matters involving engineering and technology.⁷⁰

⁶² <http://www.sanu.ac.rs/English/Bioethics/Bioethics.aspx>

⁶³ 学部科学道德建设委员会

⁶⁴ 中国科学院

⁶⁵ <http://www.casad.cas.cn/channel.action?chnlid=221>

⁶⁶ 转基因和纳米技术研发行为准则, <http://www.casad.cas.cn/document.action?docid=7267>

⁶⁷ 科学道德建设委员会

⁶⁸ 中国工程院

⁶⁹ 中国工程院院科学道德行为准则；中国工程院院科学道德守则,

http://www.cae.cn/cae/html/main/col15/2012-02/24/20120224094527266159538_1.html

⁷⁰ <https://www.nae.edu/About.aspx>

The Center for Engineering Ethics and Society (CEES) at the U.S. National Academy of Engineering (NAE) addresses the social responsibilities of engineering in the face of increasing complexity and accelerating environmental and societal change and innovation⁷¹. CEES has four employees and draws upon the resources of NAE, and is also financially supported by The National Science Foundation⁷² and Innovyze⁷³ (a private company). NAE and CEES type funding from private and public sector is not characteristic for European national science academies and their committees.

In some cases, academies establish or co-establish (with other relevant stakeholders such as universities, research institutions, research-funding councils etc.) committees that investigate allegations of scientific misconduct. For example, ALLEA advises its members to consider the Netherlands model of establishing the National Board for Research Integrity (LOWI)⁷⁴. LOWI was founded by Royal Netherlands Academy of Arts and Sciences (KNAW), together with the Netherlands Organisation for Scientific Research (NWO) and the Netherlands' Association of Universities (VSNU), as an independent advisory body and as a science court of appeal (in the cases when a complaint is filed about preliminary decisions of other institutions). LOWI consists of six members, appointed by the boards of KNAW, NWO and VSNU. All members of LOWI are also members of KNAW. Since LOWI deals with complaints, special attention is paid to prevent conflict of interest.

LOWI is a member of the European Network of Research Integrity Offices (ENRIO)⁷⁵. Several other academies or bodies are also members or observers of ENRIO, e.g. Austrian Agency for Research Integrity (OeAWI), Royal Flemish Academy of Belgium for Science and the Arts, Academy of Sciences of the Czech Republic, Royal Irish Academy, Polish Academy of Sciences, Swiss Academies of Arts and Sciences.⁷⁶

The LOWI model had been adopted by the Flemish Commission for Scientific Integrity (VCWI), which was established in 2013 by the Royal Flemish Academy together with the national funding body and several universities. In Poland, the Commission on Ethics in Science at the Polish Academy of Sciences has a similar role.⁷⁷ Austria's OeAWI, founded by the Austrian Academy of Sciences together with universities and research-funding institutions, is also very similar to LOWI in aims and structure (although it was established in 2002, a year before LOWI).

Academies that also include research institutes typically handle their own cases of misconduct, such as the Committee for Scientific Integrity at the Academy of Sciences of the Czech Republic⁷⁸ or the Institute for Ethics and Values for research in ethics⁷⁹ of the

⁷¹ <http://www.nae.edu/Projects/CEES/106421.aspx>

⁷² www.nsf.gov

⁷³ www.innovyze.com

⁷⁴ <https://www.know.nl/en/topics/ethiek/landelijk-orgaan-wetenschappelijke-integriteit-lowi>.

⁷⁵ <http://www.enrio.eu/>

⁷⁶ <http://www.enrio.eu/organisation-3/member-organisations>

⁷⁷ <http://www.instytucja.pan.pl/index.php/komisja-do-spraw-etyki-w-nauce>

⁷⁸ See “Code of Ethics for Researchers of the Academy of Sciences of the Czech Republic”.

http://www.cas.cz/o_avcr/zakladni_informace/dokumenty/eticky_kodex.html.

⁷⁹ <http://www.iev.si/en/>

Slovenian Academy of Sciences and Arts. In some countries (e.g. Switzerland, Ireland⁸⁰), where the responsibility of handling cases of scientific misconduct rests solely with the particular research institutions, national academies have drawn up recommendations on how to organise appropriate procedures.

4.2 Academic and Professional Organisations

Most professional and scientific associations and societies are non-profit organisations, open to professionals or professional bodies working in the field. A membership fee is usually charged. Organisational structures vary greatly, depending on the professional scope and activities of the organisation. Larger organisations include regional branches and specialised societies. The members of the governing bodies are elected by the members and are in charge of managing the institution, appointing special committees or working groups and drafting the association's policy statements.

Apart from scientific and technical committees, larger associations usually establish special interest working groups that cover a particular area of scientific, professional or technical activities. Specialised working groups are sometimes formed to tackle ethical issues and propose guidelines. For example, the European Society of Human Reproduction and Embryology founded a Special Interest Group Ethics and Law that draws up statements on ethical issues in its field.⁸¹ The European Federation of Psychologists' Associations has established the Board of Ethics, responsible for ethical guidelines.⁸²

Some associations establish forums that allow their members to get advice on ethical issues in their everyday work. For example, the Ethics consultancy forum of the Social Research Association offers informal, confidential forum to support researchers.⁸³ The China Association for Science and Technology⁸⁴ (CAST) is the largest national non-governmental organisation of scientific and technological workers in China. Due to its 201 member societies and nationwide local branches, CAST maintains close ties with millions of Chinese scientists, engineers and other people working in the fields of science and technology. The major aim of CAST is to improve the development and understanding of S&T in the whole China and to conduct science popularisation and S&T consulting.⁸⁵ CAST has a Special Committee on the Ethics and Rights of Science and Technology Workers⁸⁶, which conducts the development and supervision of the R&D integrity of Chinese S&T scholars and also improves the scientific ethics through institutions and regulations.⁸⁷

⁸⁰ See Swiss Academies of Arts and Sciences, *Integrity in scientific research: Principles and procedures*, 2008, pp. 21-27 (<http://www.akademien-schweiz.ch/en/index/Portrait/Kommissionen-AG/Wissenschaftliche-Integritaet.html>) and "Draft Policy Statement on Ensuring Research Integrity in Ireland", pp. 12-15 (<http://www.iaa.ie/wp-content/uploads/2013/01/Ireland-Research-Integrity-statement-Draft-2-03.pdf>)

⁸¹ <http://www.eshre.eu/Specialty-groups/Task-forces/TF-Ethics-and-Law/Documents-of-the-Task-Force-Ethics-Law.aspx>

⁸² <http://ethics.efpa.eu/board-of-ethics/history/>

⁸³ <http://the-sra.org.uk/research-ethics/ethics-consultancy-forum/>

⁸⁴ 中国科学技术协会

⁸⁵ <http://english.cast.org.cn/n1181872/n1257426/16297382.html>

⁸⁶ 科技工作者道德与权益专门委员会

⁸⁷ <http://zt.cast.org.cn/n435777/n435799/n13518146/n13518511/13522275.html>

The Chinese Society of Medical Ethics of the Chinese Medical Association⁸⁸, established in 1988, works on expediting the development of the life science ethics systems in China. It has the Committee on Medical Ethics Regulation⁸⁹, which works on exploring and raising medical ethics norms. Under the work of the Society of Medical Ethics, local medical ethics committees are also set up in provinces and big cities. The norms and regulations drafted and issued by the Society of Medical Ethics include: the Declaration of the Chinese Society of Medical Ethics of the Chinese Medical Association⁹⁰ (1998), the Organisational Rules of Hospital Ethics Committees⁹¹ (due to which the ethics committees were built up in many hospitals), the Regulation for high-tech using ethics in medical uses⁹².

5 Procedures for Ethics Assessment

National science academies and academic and professional organisations issue opinions, recommendations and guidelines, as well as initiate discussions among their peers, policy makers and public. Typically, they conduct ethics assessment and/or provide guidance in-house. With the exception of member institutions, which are required to follow CoEs, internal rules and scientific integrity standards, academies' assessments are generally non-binding and in majority of cases there is no systematic monitoring of compliance with their recommendations.

5.1 National Scientific Academies

There are two ways in which science academies engage in ethics assessment a) indirectly, through standard-setting and advisory work, or b) directly by dealing with cases of scientific misconduct. Academies regularly issue advisory reports or statements, concerning science policies or science-related issues, intended for governmental consideration or as interventions in public debates. In many countries, academies also design research ethics/integrity guidelines. Several academies throughout Europe have founded or co-founded scientific integrity committees that investigate alleged cases of scientific misconduct upon request. Their mission is a) to design protocols of dealing with research misconduct to be suggested to other institutions (e.g. Working Group on Research Integrity at Royal Irish Academy⁹³) and b) to provide an independent investigation on cases of scientific misconduct upon request, usually when there has been a complaint regarding decisions of internal investigations at other institutions (e.g. LOWI⁹⁴, Flemish Commission for Scientific Integrity at Royal Flemish Academy of Belgium for Science and the Arts).

The (revised) Standardised evaluation protocol (SEP) for research assessments in the Netherlands⁹⁵ (VSNU, NWO and KNAW, 2014) describes the methods used to assess

⁸⁸ 中华医学会医学伦理学分会

⁸⁹ 医学伦理学会伦理法规委员会

⁹⁰ 中国医学会医学伦理学会宣言

⁹¹ 医院伦理委员会组织规则

⁹² 医学（用）高技术道德规范

⁹³ <http://www.ria.ie/about/our-work/policy/research-integrity.aspx>

⁹⁴ <https://www.know.nl/en/topics/ethiek/landelijk-orgaan-wetenschappelijke-integriteit-lowi>

⁹⁵ <https://www.know.nl/en/news/publications/standard-evaluation-protocol-2015-2013-2021>

research conducted at Dutch universities, NWO and Academy institutes every six years, as well as the aims of such assessments. The primary aim of the SEP is to reveal and confirm the quality of the research and its relevance to society and to improve these where necessary. SEP assessments thus focus on the strategic choices and future prospects of research groups, and it is important for the assessment committees to tailor their recommendations accordingly. In the view of the research units, institutions and assessment committees, assessments of the quality and relevance of research fulfil a duty of accountability towards government and society. The assessment committee assesses the research unit on the three assessment criteria, which are applied with a view to international standards.

In respect to the methods, the Rathenau Institute of KNAW does not have a single framework of shared values, principles, methods, tools and practices. In respect to the ethics assessment procedure, the Institute works on individual cases, either on its own initiative or at the request of stakeholders, on a three-step basis: 1) analysis of the issues at stake, 2) selection of the type of expertise needed to tackle the issue, and 3) decision on the methods and tools to be used for the assessment.⁹⁶ Institute adjusts regular Technology Assessment methods and tools (case studies, interviews, public surveys, focus groups, expert meetings, stakeholder dialogues) adapting them to the specificities of the case at stake, as each case is different. The Board of the Institute defines the programme of work reflecting current developments in science and technology giving the voice to the stakeholders and the public, with particular attention given to public controversy. The Institute's recommendations are advisory, not binding, with the Institute's reports publically available online⁹⁷.

Similarly, the German National Academy of Science and Engineering *acatech*⁹⁸ has no specific set of values defined in the mission statement of the Academy, or a specific code of conduct. The Academy and its members adhere to principles of good scientific conduct defined by German Research Foundation (DFG)⁹⁹. As far as policy advice is concerned there are internal procedures with respect to quality assurance and peer review that integrate different perspectives, mostly from the members of the academy, and in some cases also external experts who are either scientists or representatives of the industry¹⁰⁰. The results of *acatech* projects are in the form of recommendations presented to "*policy makers, the business sector and the interested public in scientific series, symposia, fora and discussion panel*"¹⁰¹.

The Polish Academy of Sciences Ethics in Science Commission (ESC) issues opinions on matters concerning breaches of ethical principles in science by employees of universities, scientific units of the Academy and research institutions in cases that have been referred to it. Opinions are binding and the Commission can on its own initiative refer matters regarding such breaches to competent disciplinary committees, which proceed with the assessment.

⁹⁶ See Appendix, interview table on the Rathenau Institute

⁹⁷ www.rathenau.nl/en/publications.html

⁹⁸ www.acatech.de

⁹⁹ For more information:

http://www.dfg.de/download/pdf/dfg_im_profil/reden_stellungnahmen/download/empfehlung_wiss_praxis_1310.pdf (English version starts on page 61)

¹⁰⁰ www.acatech.de

¹⁰¹ Ibid.

The U.S., which puts a lot of emphasis on ethical aspects of human subjects research, is one of the few developed countries that do not have a standing independent bioethics commission¹⁰². Instead, the Presidential Commission for the Study of Bioethical Issues (the Bioethics Commission) is

an advisory panel of the nation's leaders in medicine, science, ethics, religion, law, and engineering. The Bioethics Commission advises the President on bioethical issues arising from advances in biomedicine and related areas of science and technology. The Bioethics Commission seeks to identify and promote policies and practices that ensure scientific research, health care delivery, and technological innovation are conducted in a socially and ethically responsible manner.¹⁰³

The Centre for Engineering Ethics and Society (CEES) at the National Academy of Engineering (U.S.) offers ethics guidance and usually gets project requests by an agency or organisation (public or private) on a topic of public concern¹⁰⁴. Almost all requests are accepted, but may be altered by the CEES through negotiation with the requester of the project. For every project, a committee either advises CEES or in the case of consensus committee actually produces the resulting report. CEES also conducts topical workshops and manages Online Ethics Centre (OEC), offering access to cases and scenarios, ethical codes and guidelines, teaching tools, annotated bibliographies, evaluation tools and education resources¹⁰⁵. OEC's Content Editorial Boards review and guide the content collection. The participants of the Boards are volunteers and typically members of the NAE with a background in engineering, science and technology studies or from the ethics communities. From workshops CEES will often produce summaries, which states suggestions from individual speakers, but are not recommendations from NAE. For CEES to make formal recommendations they have to work with a consensus committee of experts, where a report has to go through a review process. The review is external and is up to twenty people and their staff. The committee reviews the report and has to respond to criticism before the report can be published and recommendations made.

5.2 Academic and Professional Organisations

Academic and professional organisations develop discipline-specific guidelines and provide advice and training on research ethics. Ethics-related activities are carried out through delegated bodies within the association, such as working groups or committees on professional ethics. Associations try to encourage the use of their guidelines among their members by:

- Organising forums for discussions on ethical issues within the discipline;
- Organising research ethics training courses. An example is the Research Ethics Course – TRREE by the World Medical Association:

The primary goal of TRREE training modules is to provide training and resources to those who ensure the protection of the rights and interests of individuals and

¹⁰² http://en.wikipedia.org/wiki/The_President's_Council_on_Bioethics#Expiration_and_replacement

¹⁰³ <http://bioethics.gov/about>

¹⁰⁴ <https://www.nae.edu/Projects/CEES>

¹⁰⁵ <http://onlineethics.org>

communities serving as participants in health research. The training material is designed for all those involved in collaborative research involving humans including physician-investigators and other researchers, students, research ethics committees and regulatory agencies.¹⁰⁶

- Reviewing ethical codes of member institutions. One of the important on-going tasks of the European Federation of Psychologists Associations Board, “is the development of the reviews of Member Associations Codes. Codes have been evaluated in terms of their compatibility with the EFPA Metacode. This strategy was adopted as part of the approach to empower member associations to take full responsibility and ownership of their own ethical systems, taking into account their local laws and regulations”.¹⁰⁷

In many cases, professional associations engage in implicit ethical assessment through standardisation, licensing and accreditation policies, which represent both good practice and a basic requirement for professional activity in many fields of engineering, IT/technology and medicine. Such regulations expand onto other areas of scientific and professional pursuit and are closely related with academic, professional and career-oriented issues within particular field. For example, OVE - Österreichischer Verband für Elektrotechnik (Austrian Electrotechnical Association),

... published the first safety regulations for electrical engineering already in 1889, being one of the first institutions for electrical standardisation worldwide. Within the next decades electrotechnology was prospering – the association paved the way for technological advance, its members contributed notably to technological innovations. Today, more than 125 years after its founding, the primary objectives of the association are still the same. [...] Electrotechnical standardisation and certification ensure safety as well as technological and subsequently economic advance. OVE supports the economy in the global market and guarantees the compliance with national as well as international standards and guidelines in an objective and independent manner. [...] The OVE Academy offers professional training and provides experts, producers and operators with a platform for knowledge exchange in close cooperation with universities and technical colleges.¹⁰⁸

6 Principles and Issues for Ethics Assessment

6.1 National Science Academies

The general values and principles, traditionally promoted by national science academies can be divided into several groups, according to the aims of these organisations:

- The advancement of science:
 - Freedom and autonomy,
 - Universality,
 - Excellence.
- Scientific integrity & social responsibility:

¹⁰⁶ <http://www.wma.net/en/70education/10onlinecourses/70tree/index.html>

¹⁰⁷ <http://ethics.efpa.eu/board-of-ethics/work-plan/>

¹⁰⁸ www.ove.at

- “The European Code of Conduct for Research Integrity” by ALLEA and the European Science Foundation (ESF) lists the following principles:
 - Honesty in communication,
 - Reliability in performing research,
 - Objectivity,
 - Impartiality and independence,
 - Openness and accessibility,
 - Duty of care,
 - Fairness in providing references and giving credit,
 - Responsibility for the scientists and researchers of the future.¹⁰⁹
- A very similar set of values can be found in the IAP/IAC’s report “Responsible Conduct in the Global Research Enterprise”:
 - Honesty,
 - Fairness,
 - Objectivity,
 - Reliability,
 - Scepticism,
 - Accountability,
 - Openness.¹¹⁰
 - Prevention of harm:
 - Human dignity,
 - Informed consent,
 - Regard for vulnerable groups,
 - Privacy and confidentiality etc.

Different sets of values are not always easily reconcilable. At the most general level, there is an on-going debate on the dilemma between the freedom and autonomy of scientific pursuit on one hand and its social responsibility on the other.¹¹¹

The Committee of Bioethics at the Presidium of the Polish Academy of Sciences covers topics of human subjects research, human dignity, non-discrimination, autonomy and justice and issues statements concerning:

- The ethical problems of reproductive medicine and the genetics, and the need to introduce necessary laws concerning these issues;¹¹²
- Pre-implantation genetic diagnosis;¹¹³
- Direct-to-consumer genetic tests;¹¹⁴
- The “conscience clause”.¹¹⁵

¹⁰⁹ European Science Foundation and ALLEA, *The European Code of Conduct for Research Integrity*, March 2011. http://www.esf.org/fileadmin/Public_documents/Publications/Code_Conduct_ResearchIntegrity.pdf, p. 5.

¹¹⁰ InterAcademy Council and IAP – the global network of science academies, *Responsible Conduct in the Global Research Enterprise*, Policy Report, September 2012, p. 7.

¹¹¹ Drenth, P.J.D., J.E. Fenstad and J.D. Schiereck (eds.), *European Science and Scientists between Freedom and Responsibility*, Office for Official Publications of the European Communities, Luxembourg, 1997.

¹¹² <http://www.bioetyka.pan.pl/images/stories/Pliki/stanowisko%20kb%20nr%201-2012.pdf>

¹¹³ <http://www.bioetyka.pan.pl/images/stories/Pliki/stanowisk%20kb%20nr%202-2012.pdf>

¹¹⁴ <http://www.bioetyka.pan.pl/images/stories/Pliki/stanowisko%20kb%20nr%203-2013.pdf>

The main ethical issue of concern for the Royal Netherlands Academy of Arts and Sciences (KNAW) is scientific integrity. KNAW has played a principal role in the development of the code of conduct, developed in consultation with the Association of Universities in the Netherlands (VSNU). KNAW's 2013 report resulted in the inclusion of the sixth principle 'responsibility' in the Netherlands Code of Conduct for Academic Practice¹¹⁶. In Code's Principles of good academic teaching and research, responsibility is defined thus, "[a]cademic practitioners are cognisant of the fact that they receive funds and facilities to conduct academic research and that they are free to make their own research choices, which they explain to the best of their ability"¹¹⁷. It is further elaborated as follows:

- Researchers are willing and able to justify their choice of research themes both in advance and in retrospect. Researchers provide a clear and full account of how research funds were used and which choices this involved.
- Academic practitioners allow themselves to be judged on the quality of their output in an honest and loyal fashion, and they cooperate in internal and external assessments of their research (VSNU, 2014).¹¹⁸

The French Academy of Medicine (l'Académie de Médecine)¹¹⁹ is directly involved in research and innovation, including in the areas of their ethical, social and environmental consequences. The issues which are in the centre of public debates and public policies related with research in life sciences, such as genetics, end of life, personal autonomy, ethical issues related to medically-assisted reproductive technologies, emotional and sexual life of people with disabilities, etc., constitute the areas of work of the Academy.

With regards to ethics assessment, the primary role of the U.S. National Academies (NA) seems to be agenda and standard setting. Examples of this are presented in the following publications:

- *Integrity in Scientific Research: Creating an Environment That Promotes Responsible Conduct*¹²⁰ (2002) is a report that focuses on fostering a research environment that promotes integrity. The book "identifies practices that characterise integrity in such areas as peer review and research on human subjects and weighs the strengths and limitations of self-evaluation efforts by these institutions."¹²¹

¹¹⁵ <http://www.bioetyka.pan.pl/images/stories/Pliki/Stanowisko%20KB%20nr%204-2013.pdf>

¹¹⁶

[http://www.vsnu.nl/files/documenten/Domeinen/Onderzoek/The%20Netherlands%20Code%20of%20Conduct%20for%20Academic%20Practice%202004%20\(version%202014\).pdf](http://www.vsnu.nl/files/documenten/Domeinen/Onderzoek/The%20Netherlands%20Code%20of%20Conduct%20for%20Academic%20Practice%202004%20(version%202014).pdf)

¹¹⁷ Ibid., p. 11

¹¹⁸ For additional information, refer to the table on KNAW in the Annex.

¹¹⁹ www.academie-medecine.fr

¹²⁰ Rubenstein, Arthur H. et al. *Integrity in Scientific Research: Creating an Environment that Promotes Responsible Conduct*. The National Academic Press, Washington. 2002.

<http://iao.sinica.edu.tw/RI/doc/Educational/Integrity.pdf>

¹²¹ <http://www.nap.edu/catalog/10430/integrity-in-scientific-research-creating-an-environment-that-promotes-responsible>

- *On Being a Scientist: A Guide to Responsible Conduct in Science* (first edition in 1989, third in 2009) “describes the ethical foundations of scientific practices and some of the personal and professional issues that researchers encounter in their work.”¹²²
- *Ethical Considerations for Research Involving Prisoners* (2006) presents how prisoners can be protected when conducting research.¹²³ The publication discusses ethical issues and aims to “expand the definition of “prisoner”; ensure universally and consistently applied standards of protection; shift from a category-based to a risk-benefit approach to research review; update the ethical framework to include collaborative responsibility; and enhance systematic oversight of research involving prisoners.”¹²⁴

The Centre for Engineering Ethics and Society (CEES) at the U.S. National Academy of Engineering (NAE) addresses

Ethically significant issues that arise in engineering and scientific research, education, and practice. These issues arise for individual engineers and scientists as well as for social organisations and institutions. CEES projects engage a wide audience to help improve ethics education and enhance social responsibility in engineering and science.¹²⁵

The primary beneficiaries of CEES activities are engineering and science students, educators and researchers. Projects might also address the public or policymakers. CEES’ Online Ethics Centre (OEC)¹²⁶ covers ethical topics on:

- Environment, Safety & Sustainability which also includes focused collections on Climate Change, Engineered Systems and Society and Energy Ethics
- Professional Practice that covers a range of engineering disciplines including civil, electrical and biomedical
- Employment and Legal Issues that focus on the ethical issues for employees, managers, and organisations
- Responsible Research that includes issues of research integrity, treatment of research subjects, and social responsibility
- Emerging Technologies that focus generally as well as specifically on Synthetic Biology and Genetic Engineering and Nanoscience and Nanotechnology and Computers and Information Technology
- Diversity Issues that cover both issues in the workplace and in academia for under-represented groups.¹²⁷

The Science Ethics Committee¹²⁸ of the Chinese Academy of Sciences hosts or sponsors annual research forums on the moral and ethical principles regarding research. For example, in 2011, based on the seminar on ethics of transgenic technology and ethics of nano technology,

¹²² Bertozzi, Carolyn et al. *On Being a Scientist: A Guide to Responsible Conduct in Research*. Third edition. The National Academic Press, Washington. 2009. http://biblioteca.ucv.cl/site/colecciones/manuales_u/12192.pdf

¹²³ Gostin, Lawrence, et al. *Ethical considerations for research involving prisoners*. National Academies Press (US), 2007. <http://www.ncbi.nlm.nih.gov/books/NBK19882/?report=reader#!po=25.0000>

¹²⁴ <http://www.nap.edu/catalog/11692/ethical-considerations-for-research-involving-prisoners>

¹²⁵ <http://www.nae.edu/26187.aspx>

¹²⁶ <http://onlineethics.org>

¹²⁷ <http://onlineethics.org>

¹²⁸ 学部科学道德建设委员会

the Committee drafted the Guiding Principles Concerning the Research and Development of Transgenic and Nano Technologies¹²⁹. In 2012, the topic was about the ethical issues and social responsibilities of scientists in the research and application of stem cells, in 2013 on the ethical issues in the development of Internet technology, and in 2014, the topic was ecological environmental ethics and sustainable development.

6.2 Academic and Professional Organisations

Academic and professional organisations and societies cover two aspects of ethical values and principles:

- General, i.e. those that apply to scientific and research community as a whole,
- Specific, i.e. those that are needed within particular discipline or field.

The general ethical values and principles are similar to ethical values and principles of other organisations within sciences, but more practically oriented. They aim to:

- Motivate professional conduct (e.g. research praxis, publishing of scientific results), competency and responsibility towards profession and society,
- Foster respect for life and human dignity (without discrimination based on age, race, religion, nationality, social situation or political ideology),
- Consolidate the efforts of members and to facilitate creation of suitable environment for creative and professional development and progress,
- Enhance and expand international contacts and to develop mutually feasible collaboration with similar organisations abroad, and
- Enhance scientific and professional conduct through qualifications of members

The Social Research Association (UK) summarises its core principles into four categories:

1. Obligations to society

Social researchers must conduct their work responsibly and in light of the moral and legal order of the society in which they practice. They have a responsibility to maintain high scientific standards in the methods employed in the collection and analysis of data and the impartial assessment and dissemination of findings.

2. Obligations to funders and employer

Researchers' relationship with and commitments to funders and/or employers should be clear and balanced. These should not compromise a commitment to morality and to the law and to the maintenance of standards commensurate with professional integrity.

3. Obligations to colleagues

Social research depends upon the maintenance of standards and of appropriate professional behaviour that is shared amongst the professional research community. Without compromising obligations to funders/employers, subjects or society at large, this requires methods, procedures and findings to be open to collegial review. It also requires concern for the safety and security of colleagues when conducting field research.

¹²⁹转基因和纳米技术研发行为准则, <http://www.casad.cas.cn/document.action?docid=7267>

4. Obligations to subjects

Social researchers must strive to protect subjects from undue harm arising as a consequence of their participation in research. This requires that subjects' participation should be voluntary and as fully informed as possible and no group should be disadvantaged by routinely being excluded from consideration.¹³⁰

Specific ethical values and principles depend on the characteristics of particular field, and are generally deontological in nature. For example, across engineering, IT and technology, there is a range of public policy issues in the following areas, such as accessibility, digital government, education, innovation, intellectual property, security and privacy, voting.

The Royal Dutch Society of Engineers (KIVI)¹³¹ represents all engineering disciplines and is, with 20,000 members, the largest engineering association in the Netherlands. KIVI is not engaged in ethics assessment, but facilitates discussions on ethical issues and ethical behaviour among its members. The key issues of KIVI are:

- Education – quality of higher technical education;
- Politics and technology – Solicit attention to technical aspects of topics that get/deserve public attention;
- International – international recognition of Dutch professional education and certificates;
- Technology-pact – structural attention to technology in primary education;
- Technology promotion among the youth.¹³²

European College of Neuropsychopharmacology's Code of Conduct includes the following article on research:

Research should be conducted to the highest standards possible, with moral integrity and respect for human dignity and animal welfare. This implies adherence to accepted guidelines of ethical practice, the relevant European regulations and national recommendations, and the appropriate scientific and ethical study approval.

- Members should commit themselves to uphold the health and wellbeing of patients and research subjects as the first priority at all times.
- Consideration should always be given to scrutiny of risks and benefits and clinical best practice where applicable.
- All research findings should be reported or made available in a timely fashion, fully and honestly, both in the professional literature and in presentations at scientific meetings.
- When appropriate and possible, members should engage the public, including patient advocate bodies, to promote an informed understanding of mental health mental disorders and disorders of the brain more broadly.
- Informed consent should always be obtained for any clinical research, according to the highest possible standards, with the responsibility for ensuring that communication of information is well understood.¹³³

¹³⁰ Social Research Association, *Ethical Guidelines*, December 2003, pp. 13-14. <http://the-sra.org.uk/wp-content/uploads/ethics03.pdf>

¹³¹ <https://www.kivi.nl/>

¹³² Ibid.

¹³³ <http://www.ecnp.eu/about-ecnp/Code-of-Conduct.aspx>

The Association for Computing Machinery's COE gives the following discipline-specific ethical values and principles:

- Respect the privacy of others,
- Honour confidentiality,
- Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks,
- Improve public understanding of computing and its consequences,
- Access computing and communication resources only when authorised to do so,
- Acknowledge and support proper and authorised uses of an organisation's computing and communication resources,
- Ensure that users and those who will be affected by a system have their needs clearly articulated during the assessment and design of requirements; later the system must be validated to meet requirements,
- Articulate and support policies that protect the dignity of users and others affected by a computing system.¹³⁴

European Federation of Psychologists Associations (EFPA) Board of Ethics¹³⁵ principles and issues cover scientific and professional integrity, human subject research, human dignity, non-discrimination, autonomy, implications for civil rights, privacy health and quality of life, social responsibility, fairness and social impacts.

The Chinese Society of Medical Ethics of the Chinese Medical Association¹³⁶ focuses on the life science ethics and works on expediting the development of life science ethics systems in China. In 1998, the Society issued its first ethics code for medical scientists and workers in China, namely the *Declaration of the Chinese Society of Medical Ethics of the Chinese Medical Association*, reflecting general principles of Hippocratic Oath, focusing on clinical ethics, moral life, population ethics and environmental ethics, and emphasising the need to carry out medical ethics education in all medical institutions, medical and health departments. At the same time, the members “adhere to raise the moral quality of the medical staff, to strengthen the moral convictions of medical personnel, regulate doctor-patient relationships, correct behaviour ...”¹³⁷

7 Problems and Developments

As majority of science academies and academic and professional organisations generally conduct ethics assessment and guidance with results that are non-binding, there is in the majority of cases no systematic monitoring of compliance with their recommendations. Thus, the German government is currently considering the establishment of an evaluation system of both national academies, acatech and Leopoldina, that would include the evaluation of what has been done with recommendations, compliance with them etc.

¹³⁴ <http://www.acm.org/about/code-of-ethics>

¹³⁵ www.efpa.eu/ethics

¹³⁶ 中华医学会医学伦理学分会

¹³⁷ 中国医学会医学伦理学会宣言

While there is no single coordinated approach to ethics assessment in UK, it has a very well developed system of ethics assessment with a wide variety of organisations engaging in ethics assessment or ethics guidance. National associations for R&D professions play part in upholding and promoting ethical standards in the UK.

The U.S. generally has a reactive approach to the ethical issues in science and technology. This attitude seems to be a cultural characteristic of the U.S. where there is a strong belief in leaving science and technology develop autonomously. For example, the U.S. puts a lot of emphasis on ethical aspects of human subjects research. However, the U.S. is one of the few developed countries, which does not have a standing bioethics commissions. The intertwined nature of governmental bioethics assessment with political developments is also a defining characteristic of ethics assessment in the U.S. Also, unlike European national science academies, the activities of the U.S. National Academies are financed both by public and private sectors.

Germany has similar situation in medicine, and the fact there is no national ethics committee for medical research has brought heterogeneity among federal states. There is continuous effort to improve this; the same holds for the maintenance of independence of the RECs and regulations concerning the scope of topics for RECs. Ethics training for researchers is widely lacking (except for the training offered by the *Arbeitskreis Medizinischer Ethik-Kommissionen in der Bundesrepublik Deutschland* for members of RECs), and capacity building is desirable.

Some interviewees expressed concerns about policy-makers' stance on the advice and guidelines given by academic organisations, notably in Serbia and Poland. Too often, the decision-makers do not accept/follow recommendations established by academic committees or see the need to conduct ethics assessment, and try to avoid difficult topics. Other pressing challenge is the lack of necessary resources (administrative staff, budget) that would facilitate the work of academic committees. In both cases, in Serbia and Poland, the political systems and ethics assessment committees are relatively young. In Serbia, the process of accession negotiations with EU accelerated the harmonisation with EU legislative on ethics assessment. The growing importance of ethics issues globally also resulted in rising awareness about the importance of ethics assessment of R&I compared with situation ten years ago. This is also the consequence of significantly improved legislative framework related to ethics assessment during last decade.

The challenge to connect to policy makers is considerable even for established institutions. The Dutch Rathenau Institute is perceived as influential opinion-making organisation, active in the media and in the parliament. The parliament is the Institute's main stakeholder, however, according to the interviewee, the relationship is "loose" and the Institute has to put a lot of effort in order to connect the parliament's and the Institute's agendas. The Rathenau Institute has developed a monitoring system of the impact of their assessment. The information specialist at the department of Communication monitors how many times the Institute is mentioned in the media and in the parliamentary debate.

More than any other reviewed country, the Netherlands has a tradition of political decision-making in which CSOs play an important role in political discussions. In part as a result of this tradition, the government sometimes organises broad consultations with CSOs and the public when important decisions are to be made regarding the social desirability and ethical

permissibility of major advances in research and innovation, or major infrastructural projects. In our interviews of Dutch organisations with a role in the performance, governance or coordination of R&I in the public and private sector, and those that are stakeholders in R&I, it was found that many favour some form of ethics assessment, and that participatory, consensus-based approaches to ethics assessment are often favoured¹³⁸. On the other hand, one of the challenges in ethical assessment in Spain is the limited participation of civil society. It would be necessary to find ways to increase participation of the public and CSOs in ethics committees and increase the public debate in ethical issues. Similar holds for Poland and Serbia.

In China, medical ethical research, regulations and practices are very recent. In bioethics, for example, there has been little ethical review until 2007, when China's Ministry of Health finally approved first general regulations on ethical review of biomedical research involving human subjects. One of the challenges was to “fit ethical review within the country's own laws and regulations while also abiding by international bioethical principles”¹³⁹. Another, general challenge in China is independence. Chinese public institutions are directly affiliated with the government and almost all Chinese higher education institutions are under the central or local government. Thus, Chinese government plays a very important role in the area of public research and innovation.

In general, there is still not enough knowledge about good scientific practice and research integrity, even among established researchers. The implementation of guidelines can be different from country to country due to legal and cultural differences. But no matter the amount of regulations, codes, sanctions or punishments, it is the individual conscience of the scientist or the researcher that is of the final importance. The scientific/moral conscience should be developed within students and younger researchers by training, education, discussions, as well as by setting an example. Therefore more positive role models would be needed to teach younger generation in this regard.

¹³⁸ The focus of ethics assessment practices among interviewed organisations is on patient welfare and public health, sustainable development, and scientific integrity.

¹³⁹ Qiu Renzong, “China taking the right steps in bioethics”, <http://www.scidev.net/global/health/opinion/china-taking-the-right-steps-in-bioethics.html>. (Qiu Renzong, honorary director of the Centre for Applied Ethics at the Chinese Academy of Social Sciences in Beijing, China.)

8 Annex: Ethics Assessment and Guidance in Specific Science Academies and Academic and Professional Organisations

This Annex contains 12 reports on particular surveyed science academies and academic and professional organisations (see Table 1). For each academy and academic and professional organisation that was surveyed, basic data is provided about the organisation, its mission, structure, and role in ethics assessment and/or ethical guidance, and its procedures for assessment and guidance. Altogether, four academies of science were interviewed (two reports from Poland's PAS and one from United States interviewed representatives of respective academy's ethics committee – these are counted under the academy), and six academic and professional organisations. Overall, this report is based on findings from 23 interviews with representatives from academies and academic and professional organisations, with the selection of abovementioned 11 interview reports presented below.

The following organisations were surveyed:

Country/Region	Name in English	Organisation type
Austria	Austrian Agency for Research Integrity (Österreichische Agentur für wissenschaftliche Integrität)	Academic association
China	China Association for Science and Technology (CAST)	Academic/professional organisation
European	All European Academies (ALLEA)	Association of Academies of sciences
European	European Federation of Psychologists Associations (EFPA)	Academic/professional organisation
Germany	acatech – National Academy of Science and Engineering (Deutsche Akademie der Technikwissenschaften)	National academy of science
Germany	Research Ombudsman	Academic association
Poland	Polish Academy of Sciences (PAS): The Ethics in Science Commission (ESC)	National academy of science/ National ethics committee
Poland	Committee of Bioethics at the Presidium of the Polish Academy of Sciences	National academy of science/ National ethics committee
The Netherlands	The Royal Netherlands Academy of Arts and Sciences (KNAW)	National academy of science
The Netherlands	The Rathenau Institute	Academic/professional organisation (part of KNAW)
The Netherlands	Royal Dutch Society of Engineers (KIVI)	Academic/professional organisation
United Kingdom	British Psychological Society (BPS)	Academic/professional organisation
United States	Centre for Engineering Ethics and Society (CEES) at the National Academy of Engineering (NAE)	National academy of science/ National research ethics committee

Table 1: List of the surveyed organisations

Name of organisation	Austrian Agency for Research Integrity (Österreichische Agentur für wissenschaftliche Integrität)
Type of organisation	Civil society organisation
Country	Austria
Website address	<i>General:</i> http://www.oeawi.at/en/ <i>Main page(s) on ethics assessment:</i>
Basic description (organisation and mission)	The Austrian Agency for Research Integrity is an association consisting of 36 members (public universities, funding organisations, Christian Doppler Research Association and other Research Institutions such as the Institute of Science and Technology Austria, the Joanneum Research or the Austrian Academy of Science). The Agency was established as an association in accordance with the Austrian Associations Act and founded by 12 Austrian Universities as well as the Austrian Academy of Sciences, the Vienna Science and Technology Fund, the IST Austria and the Austrian Science Fund.
Interest in research and innovation	The Agency is responsible for investigating alleged cases of scientific misconduct in Austria in a professional manner, evaluating the severity of each violation and proposing consequential measures.
Ethics assessment and/or guidance	Assessment <input checked="" type="checkbox"/> Guidance <input checked="" type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> Commentary: If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> Other <input type="checkbox"/>
Terminology for ethics assessment / guidance	Ethics assessment and guidance.
Name and description of ethics unit(s)	
Aims and motivation for ethics assessment	The Agency was founded due to acute pressure, after a clinical trial at the University of Innsbruck was conducted so inappropriately that it must be considered entirely invalid (case Hannes Strasser, which was reported in <i>Nature</i> : “Something seems rotten in the state of Austria”). The Agency aims to prevent research misconduct and to raise awareness by offering courses and workshops on research integrity and good scientific practice lectures to its member institutions. The main focus lies on the education and support of

	<p>PhD students and young researchers. The Agency also plans to publish recommendations of what should be regarded as misconduct and how to detect and prevent it. The Agency tries to act as an independent third party and to eliminate possible conflicts of interest, which is regarded as the actual added value in the system. Although universities also have committees on good scientific practice, internal investigations might not be accepted as impartial due to possible informal connections between members of the committee and a party in a conflict.</p>
Objects and scope of assessment	<p>The Agency is responsible for cases of research integrity in its member institutions as well as for the promotion of good scientific practice and research integrity. The approach taken is a procedural one. In practice there are about 10-20 cases which are reported to the Agency per year. The actual number which is followed up is between 5-10 cases a year.</p>
Beneficiaries of assessment	<p>Members of the Austrian Agency for Research Integrity.</p>
Ethics assessment unit: appointment process	<p>The members of the Austrian Agency for Research Integrity are classified as full (those who participate fully in the work of the association), special (those who promote the association's activities in other ways) and honorary (those who are appointed as such due to extraordinary achievements in connection with the association) members. All physical and legal persons as well as organisations with legal personality are eligible to become members. The General Assembly of the association decides on the induction of full and special members by a two-thirds majority. Honorary members are appointed by the General Assembly on the basis of nominations by the board of the association.</p>
Procedure for ethics assessment: before	<p>The Agency investigates all cases which are reported by a member institution, but can also investigate in cases which are reported to the Agency by individuals. In the latter case, the Agency is obligated to take up the case. The Agency has neither an arbitrary nor an adjudicative function, but offers a neutral and factual platform for investigating thoroughly and impartially (alleged) cases of scientific misconduct. As regards authorship quarrels, the Agency acts as a kind of arbitration board.</p>
Procedure for ethics assessment: during	
Procedure for ethics assessment: after	<p>The "judgment" of the Agency in the case of proceedings is non-binding. This does however not reduce its impact.</p>
Principles and issues in assessment / guidance	<p> <input checked="" type="checkbox"/> scientific integrity <input type="checkbox"/> justice / fairness <input type="checkbox"/> professional integrity <input type="checkbox"/> implications for health and/or safety <input type="checkbox"/> human subjects research <input type="checkbox"/> implications for quality of life </p>

	<input type="checkbox"/> treatment of animals in R&I <input type="checkbox"/> environmental impacts <input type="checkbox"/> human dignity <input type="checkbox"/> social impacts <input type="checkbox"/> equality / non-discrimination <input type="checkbox"/> outsourcing of R&I to developing <input type="checkbox"/> autonomy / freedom countries with lower ethics standards <input type="checkbox"/> implications for civil rights <input type="checkbox"/> dual use (possible military uses) <input type="checkbox"/> implications for privacy <input type="checkbox"/> other, specify: <input type="checkbox"/> social responsibility <p>Commentary: Most cases relate to falsification of data (in science) or to plagiarism (in the social sciences and the humanities). Others relate to authorship questions. The Agency does not deal with the question of possible responsibility of research towards society.</p>
Self-assessments, strengths and weaknesses	<p>Especially among established researchers there is still very little knowledge about good scientific practice and research integrity. Therefore more positive role models would be needed who teach younger generation in this regard. In the humanities there is quite some awareness for e.g. citation practices, whereas in the natural sciences, citation practices are not being taught. As regards the promotion of research integrity, creating awareness was extremely difficult in Austria, as there did not even exist a term for research misconduct or integrity. The concept has to be explained and formed.</p>
Other	

Name of organisation	China Association for Science and Technology (中国科学技术协会)
Type of organisation	National non-governmental organisation of scientific and technological workers
Country	China
Website address	General: http://english.cast.org.cn/ Main page(s) on ethics committee: http://www.cast.org.cn/n35081/n11114910/n11574863/index.html
Basic description (organisation and	China Association for Science and Technology (中国科学技术协会) (CAST) is the largest national non-governmental organisation of scientific and technological

mission)	workers in China, which was founded in 1958. Due to its 201 member societies and nationwide local branches, CAST maintains close ties with millions of Chinese scientists, engineers and other people working in the fields of science and technology. It also liaises with its local affiliates through a network formed by local associations of science and technology in various provinces, autonomous regions and municipalities down to the county level. The major aim of CAST is to improve the development and understanding of S&T in the whole China and to conduct science popularisation and S&T consulting.
Interest in research and innovation	In 2011, the two topics of the seminar were ethics of transgenic technology and ethics of Nano technology. According to the discussion in this seminar, the committee drafted the Guiding Principles Concerning the Research and Development of Transgenic and Nano Technologies. In 2012, the topic was about the ethical issues and social responsibilities of scientists in the research and application of stem cells. The topic in 2013 was the ethical issues in the development of Internet technology. And in 2014 the topic was ecological environmental ethics and sustainable development.
Ethics assessment and/or guidance	Assessment <input type="checkbox"/> Guidance <input checked="" type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> If guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> None <input type="checkbox"/> Other <input type="checkbox"/>
Terminology for ethics assessment / guidance	CAST focuses on the work of scientific integrity. Regarding to this terminology, there are three main tasks of science integration: First, broadcasting the spirit of science. Second, advocating all the research organisations to establish relevant moral norms and principles on this scientific integrity. Third, protecting the rights of all scientific researchers.
Name and description of ethics unit(s)	National Scientific Ethic Promotion Team (NSEPT) 全国科学道德和学风建设宣讲教育领导小组 It was established in 2011, the team members came from five organisations, namely are, Chinese Ministry of Education, China Association for Science and Technology, Chinese Academic of Science, Chinese Academic of Social Science and Chinese Academic of Engineering.
Aims and motivation for ethics assessment	NSEPT is not responsible for scientific ethics assessment, only providing guidance on the scientific ethics and integrity. The aim of establishing the promotion team is to accelerate the construction of an innovative country, to strengthen scientific ethics and integrity, and improve the education quality.
Objects and scope of assessment	The objects and scope of guidance are: Guide students and researchers in university and research organisations to comply with academic standards, adhere to scientific integrity, to become an excellent practitioner on scientific ethics, to avoid misconduct in doing research, to promote the development of science and enhance independent innovation capability.

Beneficiaries of assessment	The beneficiaries are the students and researchers in universities and research organisation.
Ethics assessment unit: appointment process	<p>At the beginning of every year, NSPET makes year planning.</p> <p>Every year there is a national level scientific ethic promotion report in the National Meeting Hall in Beijing. The lectures during the report have been given by famous, the highest level scientists in China.</p> <p>NSPET arranges the timeline and contacts the research organisations and universities on the activities of scientific ethic promotion.</p>
Procedure for ethics assessment: before	The booklet of scientific ethic promotion guideline was edited by the experts from the five board organisations. The content of booklet is the basic definitions on scientific ethic (e.g. science spirit, plagiarism) and case study, etc.
Procedure for ethics assessment: during	<p>The focus is on education and training of graduate student at the University and scientific researchers who have just step into their research. The focus in teaching differs depending on the subject and the university. But our role is to promote also other aspects, not only science integrity but also general principles.</p> <p>There are two types of courses:</p> <ul style="list-style-type: none"> • General course (collective seminars, lectures for all students, spirit of science on a general level), • Specific departments, issues, views (different departments, e.g. life science, environment, engineering; specialised courses).
Procedure for ethics assessment: after	The three practical tasks of scientific ethic promotion activities are full coverage, professionalised and pragmatic. In 2015, NSEPT will conduct the evaluation on the effectiveness of promotion activities in the last few years.
Principles and issues in assessment / guidance	<p> <input checked="" type="checkbox"/> scientific integrity <input checked="" type="checkbox"/> justice / fairness <input checked="" type="checkbox"/> professional integrity <input checked="" type="checkbox"/> implications for health and/or safety <input type="checkbox"/> human subjects research <input checked="" type="checkbox"/> implications for quality of life <input type="checkbox"/> treatment of animals in R&I <input checked="" type="checkbox"/> environmental impacts <input checked="" type="checkbox"/> human dignity <input checked="" type="checkbox"/> social impacts <input checked="" type="checkbox"/> equality / non-discrimination <input type="checkbox"/> outsourcing of R&I to developing <input checked="" type="checkbox"/> autonomy / freedom countries with lower ethics standards <input checked="" type="checkbox"/> implications for civil rights <input type="checkbox"/> dual use (possible military uses) <input checked="" type="checkbox"/> implications for privacy <input type="checkbox"/> other </p>

	<input checked="" type="checkbox"/> social responsibility Commentary: NSEPT is situated in the human resource department in CAST. Working staffs who work on the area of human resource, some of them also work for the NSEPT. There was not so much attention on the scientific ethic issue until recent years, so attention and administration on the issue of scientific ethic in China is growing.
Self-assessments, strengths and weaknesses	
Other	

Name of organisation	All European Academies (ALLEA)
Type of organisation	Association of Academies of sciences
Country	European Union
Website address	<i>General:</i> http://www.allea.org/ <i>Main page(s) on ethics assessment:</i> http://www.allea.org/Pages/ALL/19/228.bGFuZz1FTkc.html
Basic description (organisation and mission)	ALLEA was founded in 1994 and currently brings together 58 Academies in more than 40 countries from the Council of Europe region. Members of ALLEA are representatives of national academies of science in individual countries. Independent from political, commercial and ideological interests, ALLEA's policy work seeks to contribute to improving the framework conditions under which science and scholarship can excel. Jointly with its Member Academies, ALLEA is in a position to address the full range of structural and policy issues facing Europe in science, research and innovation. In doing so, it is guided by a common understanding of Europe bound together by historical, social and political factors as well as for scientific and economic reasons. ALLEA works on ethical issues in science, policy for science, science for policy and quality assessments in research.
Interest in research and innovation	Representing European academies of sciences and humanities and imparting their positions to the relevant European authorities, ALLEA works on science policy to contribute to the improvement of the framework conditions under which science and scholarship can flourish in Europe and beyond.
Ethics assessment	Assessment [] Guidance [x] Other [] None [] Commentary:

and/or guidance	If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> Other <input type="checkbox"/>
Terminology for ethics assessment / guidance	ALLEA uses the phrase “ethics in science” and tackles a wide range of ethical issues in research and innovation.
Name and description of ethics unit(s)	Permanent Working Group Science and Ethics (PWGSE). The Working Group is composed by representatives of member academies. It meets at least twice a year and also convenes thematic meetings in wider settings, typically in partnerships with other relevant organisations such as European Science Foundation, the European Commission, UNESCO.
Aims and motivation for ethics assessment	ALLEA strives for excellence in science and scholarship and for high ethical standards in the conduct of research. The association believes ethical considerations have been an essential component in the consolidation of the new Europe. Preventing misconduct is very important for maintaining trust in science and therefore its function as a basis for national and global policy. ALLEA promotes exchange of experiences between member academies; its ethical guidelines, developed by international cooperation in PWGSE, therefore have an impact throughout Europe.
Objects and scope of assessment	The objects of ethical guidance are research practices and general developments in science. PWGSE is concerned with a wide range of problems, 'internal' (within the scientific community) and 'external' (relations between science and society). Some of the issues recently addressed include: scientific integrity and research misconduct, research on human embryos, quantitative evaluation of research, ethical aspects of risk, education in ethics.
Beneficiaries of assessment	Guidance is addressed to universities, academies and other research-performing organisations with the responsibility of educating and employing researchers, as well to the governments and other funders who have to ensure that their funds are used by beneficiaries who show full respect for the principles of responsible conduct of research.
Ethics assessment unit: appointment process	Members of PWGSE are representatives of member academies.
Procedure for ethics assessment: before	PWGSE has regular meetings, where topics are selected and discussed; positions and statements drafted. Programs of meetings are available on the website.
Procedure for ethics assessment: during	See above.
Procedure for ethics	See above.

assessment: after	
Principles and issues in assessment / guidance	<p>[x] scientific integrity [x] justice / fairness</p> <p>[x] professional integrity [x] implications for health and/or safety</p> <p>[x] human subjects research [] implications for quality of life</p> <p>[x] treatment of animals in R&I [x] environmental impacts</p> <p>[x] human dignity [x] social impacts</p> <p>[x] equality / non-discrimination [] outsourcing of R&I to developing</p> <p>[x] autonomy / freedom countries with lower ethics standards</p> <p>[x] implications for civil rights [x] dual use (possible military uses)</p> <p>[x] implications for privacy</p> <p>[x] social responsibility</p> <p>[x] other, specify:</p> <ul style="list-style-type: none"> • Freedom and autonomy of research • Ethics education and training • Ethics of scientific policy advice
Self-assessments, strengths and weaknesses	<p>Academies have their autonomy, but all member academies have accepted the European Code of Conduct for Research Integrity, co-developed by ALLEA. The implementation of guidelines can be different from country to country due to legal and cultural differences. No matter the amount of regulations, codes, sanctions or punishments, it is the individual conscience of the scientist or the researcher that is of the final importance. The scientific/moral conscience should be developed within students and younger researchers by training, education, discussions, as well as by setting an example.</p>
Other	n/a

Name of organisation	European Federation of Psychologists Associations (EFPA)
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Type of organisation	Professional association
Country	International organisation
Website address	<i>General:</i> http://efpa.eu/ <i>Main page(s) on ethics assessment:</i> http://ethics.efpa.eu/
Basic description (organisation and mission)	<p>EFPA is the leading Federation of National Psychology Associations. It provides a forum for European cooperation in a wide range of fields of academic training, psychology practice and research. There are 36 member associations of EFPA representing about 300,000 psychologists. The member organisations of EFPA are concerned with promoting and improving psychology as a profession and as a discipline, particularly, though not exclusively, in applied settings and with emphasis on the training and research associated with such practice. The psychologists in the member associations include practitioners as well as academic and research psychologists. The Federation has as one of its goals the integration of practice with research and the promotion of an integrated discipline of psychology.</p>
Interest in research and innovation	Psychological research.
Ethics assessment and/or guidance	Assessment [] Guidance [x] Other [] None [] Commentary: If assessment/guidance is undertaken: In-house [x] Outsourced [] Other []
Terminology for ethics assessment / guidance	EFPA uses ethical terminology.
Name and description of ethics unit(s)	<p>The Board of Ethics.</p> <p>The current EFPA Board of Ethics consists of 27 members, representatives of national associations.</p>
Aims and motivation for ethics assessment	The aim of EFPA is to unify and harmonise ethics in different European countries.
Objects and scope of assessment	<p>Developing general ethical guidelines and special guidelines on specific issues. EFPA closely follows new developments and emerging issues. To help psychologists throughout Europe to respond, EFPA publishes guidelines and recommendations for teaching ethics, for media communications, internet and telephone psychological services, forensic work etc.</p>

Beneficiaries of assessment	EFPA members and other psychologists.
Ethics assessment unit: appointment process	Representatives of member national associations.
Procedure for ethics assessment: before	The Board has regular meetings, where ethical topics are discussed and guidelines developed.
Procedure for ethics assessment: during	EFPA developed the Meta-Code of Ethics in 1995. At the moment, EFPA is working on the Model Code of Ethics with the view to further unify psychology ethics throughout European countries. The Meta-Code lists fundamental principles, while the Model Code will go beyond that to offer advice on how to establish an ethics committee, assessment procedures etc., with the view to establish a common European ethics framework for psychology.
Procedure for ethics assessment: after	Publishing guidelines and striving for their implementation.
Principles and issues in assessment / guidance	<input checked="" type="checkbox"/> scientific integrity <input checked="" type="checkbox"/> justice / fairness <input checked="" type="checkbox"/> professional integrity <input checked="" type="checkbox"/> implications for health and/or safety <input checked="" type="checkbox"/> human subjects research <input checked="" type="checkbox"/> implications for quality of life <input type="checkbox"/> treatment of animals in R&I <input type="checkbox"/> environmental impacts <input checked="" type="checkbox"/> human dignity <input checked="" type="checkbox"/> social impacts <input checked="" type="checkbox"/> equality / non-discrimination <input type="checkbox"/> outsourcing of R&I to developing <input checked="" type="checkbox"/> autonomy / freedom countries with lower ethics standards <input checked="" type="checkbox"/> implications for civil rights <input type="checkbox"/> dual use (possible military uses) <input checked="" type="checkbox"/> implications for privacy <input type="checkbox"/> other, specify: <input checked="" type="checkbox"/> social responsibility
Self-assessments, strengths and weaknesses	There is room for more research on ethics in the discipline. EFPA is planning to do more research on the topic and compare the state of affairs in different countries.
Other	n/a

Name of organisation	acatech – National Academy of Science and Engineering <i>(Deutsche Akademie der Technikwissenschaften)</i>
Country	Germany
Website address	<i>General:</i> http://www.acatech.de/uk <i>Main page(s) on ethics assessment:</i> N/A
Basic description (organisation and mission)	acatech is an independent and non-profit organisation, that aims at supporting both policy-makers and the society through technical evaluations and recommendations. Furthermore, it also supports the knowledge transfer between science and industry. It focuses on the following fields: scientific recommendations, transfer of expertise, promotion of young scientists and engineers, representation of scientists and engineers. acatech consists of three organs: the General Assembly, the Senate and the Executive Board ¹⁴⁰ . acatech, together with Leopoldina and the Union of the German Academies of Sciences and Humanities constitute the National Academy of Science and cooperate with each other on specific terms.
Interest in research and innovation	Issues that acatech deals with centre around the word “innovation”. Many themes from the field of engineering science are taken up by acatech with the aim of enabling the creation of innovation. The goal of these projects is to facilitate the transfer and bridge the gap between engineering sciences and the companies who create innovation, in order to add value to knowledge.
Ethics assessment and/or guidance	Assessment <input type="checkbox"/> Guidance <input type="checkbox"/> Other <input checked="" type="checkbox"/> None <input type="checkbox"/> Commentary: Policy advice ¹⁴¹ If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> Other <input type="checkbox"/>
Terminology for ethics assessment / guidance	The academy does not perform specifically ethics assessment. There is no procedure for that. What acatech does is, according to its mandate, providing policy advice. It has been among the main tasks of acatech since it has been created.
Name and description of ethics unit(s)	Within the academy there are topic networks. Speakers of the networks can decide who will become members of project groups.

¹⁴⁰ <http://www.acatech.de/uk/home-uk/profile.html>

¹⁴¹ For more information see point “Procedure for ethics assessment: during” below

Aims and motivation for ethics assessment	acatech strives toward promoting sustainable growth through innovation ¹⁴² .
Objects and scope of assessment	<p>The academy focuses on many issues concerning current social, political and economic developments. Some of its most recent publications concern communication between the scientific community, the public and the media; Ebola virus epidemic and Internet privacy¹⁴³. Topic networks of the Academy include: biotechnology, energy, nanotechnology, healthcare technologies, safety and security and others¹⁴⁴.</p> <p>Currently, a study is being prepared on the relation between the objectives of energy transition (Energiewende) and the measures applied so far. It is a review of what has been done until now. It is a separate project (“Energiesysteme der Zukunft”) and in this case acatech will not come up with recommendations but options at the end of the study. In all other acatech projects, however, there are usually recommendations.</p>
Beneficiaries of assessment	Policy makers, business sector, interested public ¹⁴⁵ .
Ethics assessment unit: appointment process	<p>Project groups usually consist of 5-15 members depending on the case. The group prepares policy advice on a particular topic. In the course of the review process additional 5-10 members or external experts may become involved.</p> <p>In each project group there is usually a philosopher and/or an ethicist who brings in the ethical arguments.</p>
Procedure for ethics assessment: before	N/A
Procedure for ethics assessment: during	<p>As far as policy advice is concerned, there are internal procedures with respect to quality assurance and peer review. Different perspectives are taken mostly from the members of the academy and in some cases also external experts who are either scientists or representatives of the industry.</p> <p>Although the question of ethics is rarely addressed directly, there is an increased awareness of ethical issues among engineers and the industry. If a proposal to be more explicit about ethics and ethics assessment was formulated, there would probably be an open discussion on that topic.</p> <p>The results of acatech projects are in the form of recommendations presented to “policy makers, the business sector and the interested public in</p>

¹⁴² Ibid.

¹⁴³ <http://www.acatech.de/uk/home-uk/work-and-results.html>

¹⁴⁴ <http://www.acatech.de/uk/home-uk/work-and-results/topic-networks.html>

¹⁴⁵ <http://www.acatech.de/uk/home-uk/work-and-results.html>

	scientific series, symposia, fora and discussion panel ¹⁴⁶ .
Procedure for ethics assessment: after	<p>Members of acatech are uncertain whether the recommendations are followed and about their exact impact. It is, however, a more general problem of assessing impact when numerous factors have to be taken into account.</p> <p>There is no systematic monitoring of compliance with the acatech recommendations.</p> <p>The Ministry currently considers the establishment of an evaluation system of both academies – acatech and Leopoldina that would include the evaluation of what has been done with recommendations, compliance with them etc.</p>
Principles and issues in assessment / guidance	<p><input type="checkbox"/> scientific integrity <input type="checkbox"/> justice / fairness</p> <p><input type="checkbox"/> professional integrity <input type="checkbox"/> implications for health and/or safety</p> <p><input type="checkbox"/> human subjects research <input type="checkbox"/> implications for quality of life</p> <p><input type="checkbox"/> treatment of animals in R&I <input type="checkbox"/> environmental impacts</p> <p><input type="checkbox"/> human dignity <input type="checkbox"/> social impacts</p> <p><input type="checkbox"/> equality / non-discrimination <input type="checkbox"/> outsourcing of R&I to developing</p> <p><input type="checkbox"/> autonomy / freedom countries with lower ethics standards</p> <p><input type="checkbox"/> implications for civil rights <input type="checkbox"/> dual use (possible military uses)</p> <p><input type="checkbox"/> implications for privacy <input checked="" type="checkbox"/> other, specify: principles of good scientific conduct</p> <p><input type="checkbox"/> social responsibility</p> <p>Commentary: There is no specific set of values defined in the mission statement of the academy, there is also no specific code of conduct. The academy and its members adhere to principles of good scientific conduct defined by German Research Foundation (DFG)¹⁴⁷.</p>
Self-assessments, strengths and	On one hand the government wants to determine the themes, the agenda and the objectives of policy advice provided by acatech. This, however, contradicts what many members of acatech expect from their academy.

¹⁴⁶ Ibid.

¹⁴⁷ For more information:

http://www.dfg.de/download/pdf/dfg_im_profil/reden_stellungnahmen/download/empfehlung_wiss_praxis_1310.pdf (English version starts on page 61)

weaknesses	<p>Scientists believe that scientific autonomy of the academy should include defining on its own the relevant themes for policy advice. Currently a debate on this issue is taking place within the academy.</p> <p>Industry has a strong position in acatech and its bodies, and some people are suspicious whether acatech is really an independent academy of sciences without an industry bias.</p>
Other	

Name of organisation	<p>Polish Academy of Sciences (PAS) (Polska Akademia Nauk)</p> <p>The Ethics in Science Commission (ESC) (Komisja do spraw etyki w nauce)</p>
Type of organisation	National academy of sciences
Country	Poland
Website address	<p><i>General:</i> http://www.pan.pl/</p> <p><i>Main page(s) on ethics assessment:</i> http://www.instytucja.pan.pl/index.php/komisja-do-spraw-etyki-w-nauce</p>
Basic description (organisation and mission)	<p>PAS is a state scientific institution. It was founded in 1952. It is a society of distinguished national and foreign scholars. The number of national members is set at no more than 350. As a research center PAS is comprised of 79 research establishments and auxiliary scientific units.¹⁴⁸ Research is financed mainly from the state budget. Within the Academy there are committees. They can be either scientific committees affiliated with divisions or problem committees affiliated with the Presidium</p> <p>The Ethics in Science Commission (ESC, <i>komisja do spraw etyki w nauce</i>) has been established on the basis of Article 39 of the act of 30 April 2010 on the Polish Academy of Sciences¹⁴⁹. It issues opinions on matters concerning breaches of ethical principles in science by employees of universities, scientific units of the Academy and research institutions. The Commission can on its own initiative refer matters regarding such breaches to competent</p>

¹⁴⁸ http://www.english.pan.pl/index.php?option=com_content&view=article&id=57&Itemid=39

¹⁴⁹ Act of 30 April 2010 on the Polish Academy of Sciences (Ustawa z dnia 30 kwietnia 2010 r. o Polskiej Akademii Nauk), 30.04.2010.

<http://isap.sejm.gov.pl/DetailsServlet?id=WDU20100960619>

	disciplinary committees. Its task was also to draw up The Ethical Code of a Researcher and to disseminate the standards of scientific integrity.
Interest in research and innovation	<p>PAS is the Polish academy of sciences. It is a society of distinguished national and foreign scholars.</p> <p>ESC issues opinions on matters concerning breaches of ethical principles in science and published The Ethical Code of a Researcher.</p>
Ethics assessment and/or guidance	<p>Assessment <input checked="" type="checkbox"/> Guidance <input checked="" type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> Commentary:</p> <p>If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> Other <input type="checkbox"/></p> <p>Commentary:</p>
Terminology for ethics assessment / guidance	Scientific integrity, disciplinary proceedings
Name and description of ethics unit(s)	The Ethics in Science Commission (<i>komisja do spraw etyki w nauce</i>).
Aims and motivation for ethics assessment	The role of the Commission is established by the relevant law (see above).
Objects and scope of assessment	The ESC mainly deals with cases referred to it that concern the alleged infringements of the rules of scientific integrity. Most cases concern accusations of plagiarism or violations of intellectual property rights. Other cases may concern fabrication of data or appropriation of authorship. After receiving a case ECS issues an opinion. It was also tasked with drawing up The Ethical Code of a Researcher.
Beneficiaries of assessment	Individual scientists, scientific community in general
Ethics assessment unit: appointment process	The Commission consists of no more than 9 members representing scientific and higher education community. The Executive Act of the Minister of Science and Higher Education of 28 October 2010 on the procedure of selecting members of the Commission on Ethics in Science ¹⁵⁰ lays down rules on the mode of its operation and the manner in which the Commission's binding opinions shall be used as well as on how it is funded. Members of the Commission are chosen from the candidates proposed by: Committee on

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http://www.instytucja.pan.pl/images/2013/Komisja_Etyki/rozporz%C4%85dzenie_Ministra_Nauki_i_Szkolnictwa.pdf

	Scientific Policy (<i>Komitet Polityki Naukowej</i>); Conference of Rectors of Academic Schools in Poland (<i>Konferencja Rektorów Akademickich Szkół Polskich</i>); Conference of Rectors of Vocational Schools in Poland (<i>Konferencja Rektorów Zawodowych Szkół Polskich</i>); Presidium of the Academy (<i>Prezydium Akademii</i>); Main Council of the Research Institutes (<i>Rada Główna Instytutów Badawczych</i>); General Council of Higher Education (<i>Rada Główna Szkolnictwa Wyższego</i>); other institutions representing scientific and higher education community. The Commission is elected by General Assembly and its term is four years. According to § 15 of the executive act in the event that a member dies or resigns a new member shall be appointed to take his or her place. Pursuant to § 17 of the executive act the Commission is funded from the government budget.
Procedure for ethics assessment: before	ESC issues opinions on matters concerning breaches of ethical principles in science by employees of universities, scientific units of the Academy and research institutions in cases that have been referred to it. The opinions are binding. The Commission can on its own initiative refer matters regarding such breaches to competent disciplinary committees.
Procedure for ethics assessment: during	Opinions are issued by panels of three members of the Commission.
Procedure for ethics assessment: after	The opinions issued by ESC are binding in the course of disciplinary proceedings conducted by disciplinary committees at institutions of higher educations.
Principles and issues in assessment / guidance	<p> <input type="checkbox"/> scientific integrity <input type="checkbox"/> justice / fairness <input type="checkbox"/> professional integrity <input type="checkbox"/> implications for health and/or safety <input type="checkbox"/> human subjects research <input type="checkbox"/> implications for quality of life <input type="checkbox"/> treatment of animals in R&I <input type="checkbox"/> environmental impacts <input type="checkbox"/> human dignity <input type="checkbox"/> social impacts <input type="checkbox"/> equality / non-discrimination <input type="checkbox"/> outsourcing of R&I to developing <input type="checkbox"/> autonomy / freedom countries with lower ethics standards <input type="checkbox"/> implications for civil rights <input type="checkbox"/> dual use (possible military uses) <input type="checkbox"/> implications for privacy <input checked="" type="checkbox"/> other, specify: see commentary <input type="checkbox"/> social responsibility </p> <p> Commentary: The following values are listed in the Ethical Code of a Researcher: conscientiousness (<i>sumienność</i>), credibility (<i>wiarygodność</i>), objectivism (<i>obiektywizm</i>), impartiality (<i>bezstronność</i>), independence (<i>niezależność</i>), openness (<i>otwartość</i>), transparency (<i>przejrzystość</i>), </p>

	responsibility (odpowiedzialność), reliability (rzetelność), care for future generations of scientists (troska o przyszłe pokolenia naukowców), courage (odwaga)
Self-assessments, strengths and weaknesses	There are some differences in opinion between members on what the actual role of the Commission should be. Some prominent members believe the Commission should deal with general matters rather than analyse individual cases and determine whether misconduct has occurred. Others, on the other hand, are of the opinion it should also focus on individual cases, since these were the expectations and hopes of the scientific community when the Commission was set up.
Other	-

Name of organisation	Committee of Bioethics at the Presidium of the Polish Academy of Sciences (Komitet Bioetyki przy Prezydium PAN)
Type of organisation	quasi-National ethics committee ¹⁵¹ (academy of sciences)
Country	Poland
Website address	<i>General:</i> www.bioetyka.pan.pl <i>Main page(s) on ethics assessment:</i> Same as the main address
Basic description (organisation and mission)	The Committee was established in 2011. It is an advisory body. Its main task is to identify and analyse ethical problems resulting from the development of the sciences, especially the biomedical sciences, and their impact on the social, political and legal spheres.
Interest in research and innovation	The Committee puts particular emphasis on the consequences of scientific progress for the development of the country, as well as the cases of negligence in the practice of scientific and social life. ¹⁵² The Committee focuses on ethical implications of technological progress in medicine and biology. It does not deal with environmental issues or the question of animal

¹⁵¹ In Poland there is no National Ethics Committee. The Committee of Bioethics at Polish Academy of Sciences performs, to some extent, the function of such a committee.

(http://www.bioetyka.pan.pl/images/stories/Pliki/KOMITET_BIOETYKI_-_program.pdf)

¹⁵² <http://www.bioetyka.pan.pl/>

	rights. It concentrates on ethical questions it finds to be most important in the present situation in Poland. For this reason the moral issues in medicine and health care polity are the main focus of the Committee.
Ethics assessment and/or guidance	Assessment <input checked="" type="checkbox"/> Guidance <input checked="" type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> Commentary: If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> Other <input type="checkbox"/>
Terminology for ethics assessment / guidance	Bioethics, ethics, advice
Name and description of ethics unit(s)	The Committee is composed of experts from the field of medicine (1/3), lawyers (1/3) and philosophers/ethicists (1/3). The members of the Committee represent different worldviews.
Aims and motivation for ethics assessment	The Committee was planned as an advisory body for decision makers.
Objects and scope of assessment	Ethical implications of technological progress in medicine and biology.
Beneficiaries of assessment	The assessment is intended for politicians. They do not, however, seek the advice of the Committee.
Ethics assessment unit: appointment process	Every member of the Polish Academy of Sciences can participate in the work of the Committee. ¹⁵³
Procedure for ethics assessment: before	The Committee acts on its own initiative – it reacts to practices it finds unsettling or picks up issues it finds particularly pressing. It functions as a system of “early warning”.
Procedure for ethics assessment: during	The Committee adopts statements, organises plenary meetings and conferences. In the case of some specific topics, the Committee may invite experts to participate in its work. The Committee issued statements concerning: <ul style="list-style-type: none"> • The ethical problems of reproductive medicine and the genetics, and the need to introduce necessary laws concerning these issues;¹⁵⁴ • Pre-implantation genetic diagnosis;¹⁵⁵ • Direct-to-consumer genetic tests;¹⁵⁶

¹⁵³ The details on the functioning of committees is described at <http://www.instytucja.pan.pl/index.php/komitet>

¹⁵⁴ <http://www.bioetyka.pan.pl/images/stories/Pliki/stanowisko%20kb%20nr%201-2012.pdf>

¹⁵⁵ <http://www.bioetyka.pan.pl/images/stories/Pliki/stanowisk%20kb%20nr%202-2012.pdf>

¹⁵⁶ <http://www.bioetyka.pan.pl/images/stories/Pliki/stanowisko%20kb%20nr%203-2013.pdf>

	<ul style="list-style-type: none"> • The “conscience clause”.¹⁵⁷ <p>Currently the Committee is focusing on issues related the right to good death, and the meaning of the increasing number of patients with dementia for the society in general.</p> <p>There is no institutional cooperation with other organisations that perform ethics assessment. There has been some interaction (exchange of letters) between the Committee of Bioethics and the Panel of Experts on Bioethics of the Polish Bishops’ Conference (<i>Zespół Ekspertów KEP ds. Bioetycznych</i>) regarding the “conscience clause”.¹⁵⁸</p>
Procedure for ethics assessment: after	<p>The Committee is well-recognised by members of the Polish Academy of Sciences. It has gained considerable authority and a significant place in the public sphere. However, this is primarily a media and not a political success. In fact the Committee is ignored by the people in power. No government institution has asked the Committee for an opinion. Although the Committee has prepared a series of recommendations and suggestions, they have not provoked any reaction from the government officials. Politicians do not understand the meaning or the role of the Committee.</p>
Principles and issues in assessment / guidance	<p><input type="checkbox"/> scientific integrity <input checked="" type="checkbox"/> justice / fairness</p> <p><input type="checkbox"/> professional integrity <input type="checkbox"/> implications for health and/or safety</p> <p><input checked="" type="checkbox"/> human subjects research <input type="checkbox"/> implications for quality of life</p> <p><input type="checkbox"/> treatment of animals in R&I <input type="checkbox"/> environmental impacts</p> <p><input checked="" type="checkbox"/> human dignity <input type="checkbox"/> social impacts</p> <p><input checked="" type="checkbox"/> equality / non-discrimination <input type="checkbox"/> outsourcing of R&I to developing</p> <p><input checked="" type="checkbox"/> autonomy / freedom countries with lower ethics standards</p> <p><input checked="" type="checkbox"/> implications for civil rights <input type="checkbox"/> dual use (possible military uses)</p> <p><input checked="" type="checkbox"/> implications for privacy <input checked="" type="checkbox"/> other, specify: see commentary</p> <p><input type="checkbox"/> social responsibility</p> <p>Commentary: The values and principles used in ethics assessment are not codified. They are, however, easy to list and include, among others, dignity, autonomy, freedom, solidarity, respect for the human being, trust. General principles often, however, become unclear when they are applied to a concrete problem</p>
Self-assessments,	<p>In general decision-makers do not follow recommendations established by</p>

¹⁵⁷ <http://www.bioetyka.pan.pl/images/stories/Pliki/Stanowisko%20KB%20nr%204-2013.pdf>

¹⁵⁸ <http://www.bioetyka.pan.pl/images/stories/Pliki/opinia%20kb%20nr%201-2014.pdf>

strengths and weaknesses	<p>the Committee.</p> <p>Decision makers in Poland do not feel the need to conduct ethics assessment. They seem to be afraid of approaching difficult topics.</p> <p>One category of challenges is the lack of necessary resources (administrative staff, budget) that would facilitate the work of the Committee.</p>
Other	

Name of organisation	<p>Royal academy of art and sciences (KNAW)</p> <p><i>Koninklijke Nederlandse Akademie voor Wetenschappen</i></p>
Type of organisation	Assessor
Country	Netherlands
Website address	<p><i>General:</i> www.knaw.nl</p> <p><i>Main page(s) on ethics assessment:</i> https://www.knaw.nl/en/topics/ethiek/wetenschappelijke-integriteit/overzicht?set_language=en</p>
Basic description (organisation and mission)	<p>KNAW: For science and scholarship</p> <p>The Royal Netherlands Academy of Arts and Sciences was founded in 1808 as an advisory body to the Dutch Government – a role that it continues to play today. The Academy derives its authority from the quality of its members, who represent the full spectrum of scientific and scholarly endeavour and are selected on the basis of their achievements. It is also responsible for sixteen internationally renowned institutes whose research and collections put them in the vanguard of Dutch science and scholarship.</p> <p>As the forum, conscience, and voice of the arts and sciences in the Netherlands, the Academy promotes quality in science and scholarship and strives to ensure that Dutch scholars and scientists contribute to cultural, social and economic progress. As a research organisation, the Academy is responsible for a group of outstanding national research institutes. It promotes innovation and knowledge valorisation within these institutes and encourages them to cooperate with one another and with university research groups.</p>
Interest in research and innovation	The Academy regularly issues advisory reports on a wide variety of subjects. In some cases, it is asked to do so by the authorities or universities; in other

	<p>cases, it does so on its own initiative.</p> <p>The subjects are extremely varied, but in general the advisory reports fall into two categories:</p> <ul style="list-style-type: none"> • Advice on science policy, for example research training programs; • Advice on a range of issues in which science has something important to say, whether its message is intended for government or civil-society organisations – for example climate policy. <p>The Academy's advice can take different forms:</p> <ul style="list-style-type: none"> • Advisory reports, which offer specific recommendations based on solid evidence; • Advisory memorandums, which offer a quick response to a topical issue; • Foresight studies, which explore a new facet of research and make recommendations based on the outcomes. <p>Agenda points for the Academy's role as an organisation for national research institutes, 2010-2015:</p> <ul style="list-style-type: none"> • Promote the role of the Academy as an organisation for national research institutes • Take a leading role in drafting the national (and international) research agenda in the various fields of research • Encourage cooperation with university research groups • Promote methodological innovation in the humanities • Encourage the neurosciences • Optimise the availability and accessibility of the collections • Promote knowledge utilisation • Achieve open access to research data and publications.
Ethics assessment and/or guidance	<p>Assessment <input checked="" type="checkbox"/> Guidance <input checked="" type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> Commentary:</p> <p>If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> Other <input type="checkbox"/></p> <p>Commentary: KNAW evaluates research in the Netherlands.</p>
Terminology for ethics assessment / guidance	<p>Honesty and scrupulousness: Scientific activities are performed scrupulously, unaffected by mounting pressure to achieve;</p> <p>Reliability: Science's reputation of reliability is confirmed and enhanced through the conduct of every scientific practitioner. A scientific practitioner is reliable in the performance of his research and in the reporting, and equally in the transfer of knowledge through teaching and publication;</p> <p>Verifiability: Presented information is verifiable. Whenever research results are publicised, it is made clear what the data and the conclusions are based on, where they were derived from and how they can be verified</p>

	<p>Impartiality: In his scientific activities, the scientific practitioner heeds no other interest than the scientific interest. In this respect, he is always prepared to account for his actions;</p> <p>Independence: Scientific practitioners operate in a context of academic liberty and independence. Insofar as restrictions of that liberty are inevitable, these are clearly stated.</p> <p>Responsibility: Academic practitioners acknowledge their responsibility for the societal implications of their work. They are willing to discuss and explain their choice of research themes.</p> <p>The VSNU code of conduct provides best practices for each of the principles.</p>
<p>Name and description of ethics unit(s)</p>	<p>The Academy has five advisory councils¹⁵⁹ that are responsible for its advisory work;</p> <ul style="list-style-type: none"> • Council for earth and life sciences • Council for the humanities • Council for medical sciences • Council for technical sciences, mathematical sciences and informatics, physics and astronomy and chemistry • Social sciences council <p>The council members are experienced experts who represent the scientific community. They suggest subjects for the Academy's advisory reports and foresight studies and supervise the advisory process, specifically by keeping a close eye on the quality of the content.</p>
<p>Aims and motivation for ethics assessment</p>	<p>The main ethical issue of concern for KNAW is integrity. KNAW has played a principal role in the development of the code of conduct, developed in consultation with the Association of Universities in the Netherlands (VSNU).</p> <p>The VSNU has developed a code of conduct for science practice. Since 1 January 2005 the Dutch Code of conduct for scientific practice has become effective at all Dutch universities. The Code of Conduct was updated in 2012 (VSNU Association of Universities the Netherlands, 2012). The code of conduct presents the principles of good scientific teaching and research. The 2013 report (KNAW, 2013) resulted in the uptake in 2014 of the sixth principle 'responsibility' in the code of conduct, in consultation with KNAW.</p> <p>The Netherlands code (VSNU Association of Universities the Netherlands, 2014) provides the principles and the best practices, on the following six principles:</p> <ul style="list-style-type: none"> • Honesty and scrupulousness: Scientific activities are performed scrupulously, unaffected by mounting pressure to achieve; • Reliability: Science's reputation of reliability is confirmed and enhanced through the conduct of every scientific practitioner. A

¹⁵⁹ <http://www.knaw.nl/en/advisory-work/advisory-councils-and-committees/overzicht>

	<p>scientific practitioner is reliable in the performance of his research and in the reporting, and equally in the transfer of knowledge through teaching and publication;</p> <ul style="list-style-type: none"> • Verifiability: Presented information is verifiable. Whenever research results are publicised, it is made clear what the data and the conclusions are based on, where they were derived from and how they can be verified • Impartiality: In his scientific activities, the scientific practitioner heeds no other interest than the scientific interest. In this respect, he is always prepared to account for his actions; • Independence: Scientific practitioners operate in a context of academic liberty and independence. Insofar as restrictions of that liberty are inevitable, these are clearly stated. • Responsibility: Academic practitioners acknowledge their responsibility for the societal implications of their work. They are willing to discuss and explain their choice of research themes. <p>The last point is particularly relevant for the ethics impact assessment framework. Responsibility is defined as “Academic practitioners are cognisant of the fact that they receive funds and facilities to conduct academic research and that they are free to make their own research choices, which they explain to the best of their ability”, and can be elaborated as follows:</p> <ul style="list-style-type: none"> • Researchers are willing and able to justify their choice of research themes both in advance and in retrospect. Researchers provide a clear and full account of how research funds were used and which choices this involved. • Academic practitioners allow themselves to be judged on the quality of their output in an honest and loyal fashion, and they cooperate in internal and external assessments of their research (VSNU, 2014).
Objects and scope of assessment	<p>The (revised) Standardised evaluation protocol (SEP) for research assessments in the Netherlands (VSNU, NWO and KNAW, 2014) (https://www.know.nl/en/news/publications/standard-evaluation-protocol-2015-2013-2021) describes the methods used to assess research conducted at Dutch universities and NWO and Academy institutes every six years, as well as the aims of such assessments.</p> <p>Focus</p> <p>The primary aim of the SEP is to reveal and confirm the quality of the research and its relevance to society and to improve these where necessary. SEP assessments thus focus on the strategic choices and future prospects of research groups, and it is important for the assessment committees to tailor their recommendations accordingly. In the view of the research units, institutions and assessment committees, assessments of the quality and relevance of research fulfil a duty of accountability towards government and society.</p>

	<p>Assessment criteria</p> <p>The assessment committee assesses the research unit on the three assessment criteria. It ensures that the qualitative assessment (text) and the quantitative assessment (assigned category 1-4) are in agreement. It is important for the committee to relate these criteria to the research unit's strategic targets. The three criteria are applied with a view to international standards.</p> <ul style="list-style-type: none"> • Research quality. The committee assesses the quality of the unit's research and the contribution that research makes to the body of scientific knowledge. The committee also assesses the scale of the unit's research results (scientific publications, instruments and infrastructure developed by the unit, and other contributions to science). • Relevance to society. The committee assesses the quality, scale and relevance of contributions targeting specific economic, social or cultural target groups, of advisory reports for policy, of contributions to public debates, and so on. The point is to assess contributions in areas that the research unit has itself designated as target areas. • Viability. The committee assesses the strategy that the research unit intends to pursue in the years ahead and the extent to which it is capable of meeting its targets in research and society during this period. It also considers the governance and leadership skills of the research unit's management.
<p>Beneficiaries of assessment</p>	<p>Universities and University departments, researchers, heads of research groups, policy officers, members of boards, or members of assessment committees.</p> <p>PhD programs and research integrity</p> <p>In addition to the criteria above, every assessment also considers at least two further aspects: PhD programs and research integrity.</p> <p>Research integrity</p> <p>The assessment committee considers the research unit's policy on research integrity and the way in which violations of such integrity are prevented. It is interested in how the unit deals with research data, data management and integrity, and in the extent to which an independent and critical pursuit of science is made possible within the unit. The assessment committee bases its assessment on how the research unit itself describes its internal research culture. The research unit undergoing assessment responds to a number of questions in the self-assessment, described in the format provided in Appendix D. The unit should use these questions to reflect on its own data management practices, the level of internal research integrity, and the transparency of its research culture. The assessment committee discusses these points during the site visit, comments on this in its report, and makes recommendations for improvement (VSNU, NWO and KNAW, 2014).</p> <p>The research integrity section (VSNU, NWO and KNAW, 2014) mentions ethical issues:</p>

	<p><i>Research integrity:</i></p> <p>General reflection covering the following aspects:</p> <ul style="list-style-type: none"> • The degree of attention given to integrity, ethics, and self-reflection on actions (including in the supervision of PhD candidates) • The prevailing research culture and manner of interaction • How the unit deals with and stores raw and processed data • The unit’s policy on research results that deviate flagrantly from the prevailing scientific context • Any dilemmas (for example of an ethical nature) that have arisen and how the unit has dealt with them
<p>Ethics assessment unit: appointment process</p>	<p>The Academy, including the ethics unit, derives its authority from the quality of its members, who represent the full spectrum of scientific and scholarly endeavour and are selected on the basis of their achievements.</p>
<p>Procedure for ethics assessment: before</p>	<p>PRIOR to the site visit</p> <p>1. Scheduling the assessments</p> <p>The board is responsible for overall scheduling and for the transparency of the assessment within its institution and decides when each research unit will be assessed. The board sets up a schedule for this purpose and publishes it on the institution’s website. The board informs the research units of the individual assessments well in advance.</p> <p>The board is also responsible for scheduling individual assessments and for dealing with the related practical aspects (for example booking the assessment committee’s flights, hotel rooms and dinners). The board lets all those involved know what is expected of them during the assessment process and when. The board also monitors the schedule.</p> <p>When preparing an assessment, the board defines the Terms of Reference (ToR) and appoints the assessment committee. These two subjects are discussed in the sections below.</p> <p>2. Terms of Reference, ToR</p> <p>The board specifies the Terms of Reference (ToR) for the assessment committee for each separate assessment.</p> <p>The Terms of Reference contain specific information about the research unit to be assessed and/or about elements that the assessment committee must consider. This information may be related to a) strategic questions or b) a research unit’s specific tasks.</p> <p>If the assessment covers a discipline, the assessment committee may be asked to make strategic recommendations for the entire discipline at national level.</p> <p><i>Conditions for the composition of an assessment committee</i></p>

	<p>Ultimately, the assessment committee must assess the results of the research unit's various activities according to the three criteria and two additional aspects of the SEP. This means that a number of conditions must be met in the composition of this committee, listed below in points a. to h. The point is to ensure that the committee as a whole satisfies all the conditions, so that it can arrive at a satisfactory assessment of the various aspects. It is therefore not necessary for each individual committee member to satisfy all conditions.</p> <p>An international assessment committee:</p> <p>a. should be familiar with recent trends and developments in the relevant research fields and be capable of assessing the research in its current international context;</p> <ul style="list-style-type: none"> • Should be capable of assessing the applicability of the research unit's research and its relevance to society; • Should have a strategic understanding of the relevant research field; • Should be capable of assessing the research unit's management; • Should have a good knowledge of and experience working with the Dutch research system, including the funding mechanisms; • Should be capable of commenting on the PhD programmes and the research integrity policy; • Should be impartial and maintain confidentiality; • Should have the assistance of an independent secretary who is not associated with the research unit's wider institution and who is experienced in assessment processes within the context of scientific research in the Netherlands. <p>3. Statement of impartiality and confidentiality</p> <p>Prior to the site visit, the members of the assessment committee sign a statement of impartiality. They are then officially installed by a representative of the institution.</p> <p>For each indicator, the unit must provide evidence pertaining to the past six years. The evidence may be qualitative in nature (in the form of a narrative, see below) and/or, where possible and useful, quantitative (in the form of figures, in a table).</p> <p>Narrative/case study: the research unit may specifically choose to provide the evidence in the form of a narrative (a case study) for the indicators in cells 4, 5 and 6. Instructions for composing a narrative can be found in Appendix D2.</p> <p>Research units draft a general text to accompany the completed table and evidence provided. The text should reflect on the results of the past six years that the unit has indicated in the completed table.</p> <p>Note: Appendixes in https://www.knaw.nl/en/news/publications/standard-evaluation-protocol-2015-2013-2021</p>
Procedure for ethics	SITE VISIT

assessment: during	<p><i>The assessment committee pays a site visit to the research unit. If the assessment involves multiple units, the site visit may take place at a single central location.</i></p> <p>1 Prior to the site visit</p> <p>The assessment committee receives the self-assessment and other relevant documentation one or two months prior to the site visit. If the committee requires additional information, it may ask the research unit to supply it.</p> <p>The assessment committee, the research unit and the board finalise the programme for the site visit.</p> <p>2 During the site visit</p> <p>Below is a description of what happens during the site visit.</p> <p><i>Private kick-off meeting</i></p> <p>The site visit commences with a private kickoff meeting of the assessment committee. This meeting should not be attended by board members or other individuals working at the institution. The meeting has two purposes:</p> <ol style="list-style-type: none"> 1. to allow the committee members to discuss the assessment procedure, the Terms of Reference and the procedure of writing the assessment report; 2. to allow the committee members to discuss their findings based on the material that they received prior to the site visit (self-assessment, other documents). <p><i>Interviews</i></p> <p>During the site visit, the assessment committee conducts interviews with delegates from the research unit involved. The purpose of these interviews is to verify and supplement the information provided in the self-assessment so that the committee can make an informed qualitative and quantitative assessment. The assessment committee interviews the following persons/bodies:</p> <ul style="list-style-type: none"> • The director/management of the research unit; • The head/heads of the research groups in the unit; • A number of staff members (tenured and non-tenured); a number of PhD students; • The boards responsible for the relevant graduate schools/research schools; • Delegates from the scientific advisory council (if the research unit has a scientific advisory council); • If necessary, delegates from the board of the institution. <p>Time is reserved in the site visit programme for a private interim meeting of the assessment committee.</p> <p><i>Private final meeting</i></p>
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	<p>After interviewing the delegates from the research unit, the assessment committee meets once again in private. At this final meeting, it discusses its Findings and the related arguments and arrives at a provisional judgement on the research unit with respect to the three criteria.</p> <p>If the committee is assessing multiple research units, or if multiple institutions are participating in the assessment, the committee convenes a private kick-off and a private final meeting for each relevant research unit. These meetings are listed in the programme; it is important for the committee to have enough time to discuss its assessment internally and to reach agreement concerning the qualitative and quantitative assessments.</p> <p><i>Presentation of provisional findings</i></p> <p>At the end of the site visit, the chairperson of the assessment committee presents a brief, general summary of the committee’s findings to the research unit. The presentation is a first impression, and the findings are not final. The research unit or institution should therefore not publicise the provisional findings.</p>
<p>Procedure for ethics assessment: after</p>	<p>Assessment report</p> <p><i>This section describes the procedure and timeframe for the assessment report and that report’s contents.</i></p> <p>1 Procedure</p> <p>After the site visit, the assessment committee writes the draft assessment report. This draft version is sent to the directors/managers of the research unit. The research unit checks the draft report for factual inaccuracies. If such inaccuracies are detected, the assessment committee sees that they are corrected.</p> <p>The assessment committee then sends the assessment report to the board. The board comments on the contents of the report. After the board has determined its position, the assessment report and the board’s position document are published on the institution’s website. In its annual report, the board indicates which research units have been assessed, what the most important conclusions and recommendations were, and what follow-up action has been taken on the recommendations.</p> <p>2 Timeframe</p> <p>A table indicates the timeframe for writing the assessment report for a single research unit.</p> <p>Public accountability and follow up</p> <p><i>This section explains the board’s responsibilities in terms of public accountability and following up on assessments.</i></p>

	<p>1 Public accountability</p> <p>The assessment reports are published in order to make performances visible and account for the way in which funding is spent. The boards are responsible for taking action in this regard in the following ways:</p> <ol style="list-style-type: none"> 1. The board ensures that the assessment report and its position document are published on the website within six months of the site visit. 2. In its annual report, the board indicates which of the institution's research units have been assessed according to the SEP, what the most important conclusions and recommendations were, and what follow-up action (broadly speaking) has been taken on the recommendations. The board also reports which research units will be assessed in the year ahead. <p>2 Follow-up</p> <p>The boards of the universities, the Academy and NWO monitor follow-up actions on assessment committee recommendations at regular intervals.</p> <p>The institutions decide for themselves how to proceed in this regard. For example, they can discuss this subject during annual meetings between the board and the research units and in this way incorporate it into their regular academic planning and control cycle. They can also require their research units to conduct a (limited) mid-term assessment after three years. This protocol does not prescribe how the follow-up is to proceed; the only instructions that the protocol gives is for the follow-up to be compatible with the institution's internal procedures.</p> <p>Note: full protocol in https://www.knaw.nl/en/news/publications/standard-evaluation-protocol-2015-2013-2021</p>
<p>Principles and issues in assessment / guidance</p>	<p>[x] scientific integrity [X] justice / fairness</p> <p>[x] professional integrity [X] implications for health and/or safety</p> <p>[] human subjects research [X] implications for quality of life</p> <p>[] treatment of animals in R&I [X] environmental impacts</p> <p>[X] human dignity [X] social impacts</p> <p>[X] equality / non-discrimination [X] outsourcing of R&I to developing</p> <p>[X] autonomy / freedom countries with lower ethics standards</p> <p>[X] implications for civil rights [X] dual use (possible military uses)</p> <p>[X] implications for privacy [X] other, specify: ANYTHING</p> <p>[X] social responsibility [X] accessibility of research results</p>

	<p>Commentary: No (ethics) assessment framework is used and no ethical principles are specified. It is up to the researchers to convince the assessors that the 3 criteria; quality of research, relevance to society and viability are met.</p>
<p>Self-assessments, strengths and weaknesses</p>	<p>Self-assessment</p> <p>1 Documents furnished by the research unit</p> <p>The research unit provides the required documents for the assessment committee. The documents include at least the following:</p> <ul style="list-style-type: none"> • The conclusions and recommendations of the previous assessment; • The research unit’s self-assessment; • The required appendices to the self-assessment • The assessment committee bases its assessment largely on the information contained in these documents and the interviews it conducts during the site visit. • The assessment committee also receives the following documents: <ul style="list-style-type: none"> • The SEP; • The Terms of Reference; • Any additional documents that are used internally by the institution (for example manuals or explanatory notes to the SEP). <p>The board is responsible for making these documents available to the assessment committee well in advance, for example by placing them on a separate website that can only be accessed by the committee members. Depending on the size of the research unit that is assessed, they should be available no later than a month or two before the site visit.</p> <p>2 Contents of the self-assessment</p> <p>The research unit writes a self-assessment. In that self-assessment, it describes as accurately as possible its efforts and results over the past six years and its plans for the coming six years.</p> <p>It discusses its strategy and specific targets, its research results and societal relevance of the past period, and its strategy (or changes it has made to its strategy) going forward. The unit conducts a SWOT analysis in this context and indicates a benchmark (preferably an international one). It also considers its PhD programmes and its research integrity.</p> <p>The research unit attaches a number of appendices to the self-assessment.</p> <p><i>Appendix with output indicators</i></p> <p>One of the appendices to the self-assessment is the table of output indicators, which the research unit fills in as follows.</p> <p>The research unit selects one or more indicators per cell that correspond with its profile and strategic decisions and that are compatible with the existing agreements (see below).</p>

	<p>The indicators given in the table in Appendix D1 of the Protocol (see link below) are only examples; the research unit may choose other indicators. However, in selecting the indicators, the definitions and the measurement and registration methods, the research unit must adhere to the internal agreements made within its institution and/or within the research field. This means the following:</p> <ul style="list-style-type: none"> • University units adhere to the internal agreements at their university (and within their research field). • Academy and NWO institutes adhere to the internal agreements at the Royal Academy and NWO respectively (and within their research field). • Research units must complete all cells unless certain cells are not relevant. In that case, the unit must explain why. <p>Note: Standard Evaluation Protocol 2015 – 2021 is available at: https://www.knaw.nl/en/news/publications/standard-evaluation-protocol-2015-2013-2021</p>
Other	Document WP1_NL_report on KNAW provides the references.

Name of organization	The Rathenau Institute (Het Rathenau Instituut)
Type of organization	Impact and/or technology assessment organization
Country	The Netherlands
Website address	<p>General: www.rathenau.nl/en.html</p> <p>Main page(s) on ethics assessment:</p> <ul style="list-style-type: none"> • Technology Assessment: www.rathenau.nl/en/who-we-are/mission/technology-assessment.html • Science System Assessment: www.rathenau.nl/en/who-we-are/mission/science-system-assessment.html
Basic description (organization and mission)	<p>The Rathenau Institute (Rathenau Instituut) is part of the Royal Dutch Academy of Sciences (KNAW). Its core aim is to study developments in science and technology, analyze their potential impact on society and to promote the formation of political and public opinion on issues and dilemmas in science and technology.</p> <p>The Rathenau Institute's mission focuses on two tasks:</p> <ol style="list-style-type: none"> 1. Studying the social impact of science and technology: This part of the Institute's activity focuses on Technology Assessment (TA), therefore on analysis of technological and scientific developments (new emerging technologies, as well as well-established technologies) and their impact on individuals and society, including new opportunities, risks, all kinds of possible societal implications (e.g. ethical, religious, social, economic, legal). 2. Describing the Dutch science system:

	<p>The second part of the Institute’s activity is Science System Assessment (SciSA) which focuses on the dynamics of science and technology and the organization of the science system.</p> <p>The Rathenau Institute was established in 1986 by the Ministry of Education, Culture and Science, which also provides funding for the functioning of the Institute. The Rathenau Institute is independent as regards the substance of its work, as it is the Institute that decides on the programme of work.</p>
Interest in research and innovation	<p>The department of Technology Assessment (TA) assesses developments in science, technology and innovation through Technology Assessment methods. This may be perceived as engaged in ethics assessment, although the focus is on the societal (ethical, cultural, social, economic, legal) effects of new developments in science and technology. With respect to the area of interests, the TA department works with a broad scope of topics. Some of the topics that the division works with include: synthetic biology, biomedical developments, the future of energy systems, the city – smart cities, smart farming, agriculture, animal welfare, ICT, privacy, security.</p>
Ethics assessment and/or guidance	<p>Assessment <input checked="" type="checkbox"/> Guidance <input type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> Commentary: The work is mostly ethics assessment and ethical analysis and awareness raising.</p> <p>If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> None <input type="checkbox"/> Other <input type="checkbox"/></p> <p>Commentary: The Institute assesses potential impacts of developments in science and technology on society and policy. Sometimes this includes explorations of ethical issues surrounding science and technology.</p>
Terminology for ethics assessment / guidance	<p>Societal assessment, technology assessment. These are assessment activities that sometimes include ethics assessment. A member of the Institute’s Technology Assessment division was interviewed who clearly stated that whenever SATORI uses the term “ethical assessment”, the interviewee refers to societal assessment or technology assessment, particularly to the societal aspects of technology assessment.</p>
Name and description of ethics unit(s)	<p>The Institute’s Technology Assessment department may be perceived as engaged in ethics assessment, although the focus is on the social and societal effects of new developments in science and technology.</p>
Aims and motivation for ethics assessment	<p>Science and technology developments play crucial role for the Netherlands innovation strategy. These developments have also a great impact on people’s lives. The Institute contributes to political opinion-forming and decision-making on this issue giving the voice to stakeholders and the public. These developments may bring both opportunities and risks, therefore the Institute works on ‘technological developments that require new frames of reference, spark public controversy or about which no facts and figures are available’¹⁶⁰.</p>
Objects and scope of assessment	<p>The Rathenau Institute assesses general developments in science and innovation through Technology Assessment methods employed by the Institute. The Board of the Institute defines the programme of work reflecting current developments in science and technology giving the voice to the</p>

¹⁶⁰ The Rathenau Institute, Mission: <http://www.rathenau.nl/en/who-we-are/about-the-institute.html>

	<p>stakeholders and the public. Particular attention is given to public controversy. There are no limitations regarding the objects of assessment. Nevertheless, the main goal is to identify and analyze the potential social and societal impact (ethical, religious, social, economic, legal) of these developments. The Institute acts either on its own initiative or at the request of stakeholders.</p>
Beneficiaries of assessment	<p>The institute's mission is to support those who have to take decisions on science and technology at the national level such as MPs, the government, policymakers, but also at the European level mostly the European Parliament. The Institute has also a broader circle of stakeholders that includes companies, academic institutions, civil-society organisations and the public at large.</p>
Ethics assessment unit: appointment process	<p>The Rathenau Institute's programme of work is defined by the Board of the Institute. The Chair and members of the Board are formally appointed by Ministry of Education, Culture and Science. The Royal Netherlands Academy of Arts and Sciences (KNAW) and the Scientific Council for Government Policy (WRR) are consulted in this process. The Institute consists of multidisciplinary team of academics and communication experts which includes physicists, biologists, social scientists, public administration experts and philosophers (in total approx. 50 employees). The Institutes uses also external expertise, e.g. engaging universities. The experts in a specific field are addressed through the institute's network.</p>
Procedure for ethics assessment: before	<p>The Institute works either on its own initiative or at the request of stakeholders (parliament, ministries). In practice, it means that the object of the assessment is related to one of the fields covered in the Rathenau Institute's programme of work.</p>
Procedure for ethics assessment: during	<p>In respect to the methods, the Rathenau Institute does not have one framework of shared values, principles, methods, tools and practices. The Institute works on individual cases on a three step basis. Firstly, they analyze what issue is really at stake. Secondly, the Institute decides on what type of expertise they need. Thirdly, they decide on the methods and tools to be used for the assessment. The interviewee emphasized that the Institute adjusts regular TA-methods and tools (case studies, interviews, public surveys, focus groups, expert meetings, stakeholder dialogues) adapting them to the specificities of the case at stake, as each case is different.</p> <p>The Rathenau Institute puts a lot of effort in order to connect with stakeholders and the public in order to address their needs and concerns. Therefore, they organize workshops, experts meetings, stakeholders dialogue, public consultations (by focus groups or by questionnaire e.g. on internet). The Rathenau Institute is also active in the media.</p> <p>The Institute's recommendations are not binding. They perceive their role as the advisory position and setting the agenda. The Institute wants to prepare politicians and policy-makers for the upcoming developments.</p> <p>The Rathenau Institute cooperates with a wide range of organisations, such as universities, other knowledge institutes (e.g. TNO), the institute's sister organisations in other European countries, public research organisations, business, NGOs, policy-makers, politicians.</p>

Procedure for ethics assessment: after	<p>In most of the cases, the assessment is followed with a report including policy recommendations. Each report consists of introduction chapter, a number of content chapters and conclusion chapter. When the Institute engaged external experts, the external experts are mostly responsible for the content chapters, while the Institute prepares introduction chapter, the conclusions and recommendations. The interviewee emphasized that the reports do not have a character of an academic publication, because the main goal of a report is to reach politicians, policy-makers and the public. In order to achieve this most of the Rathenau Institute's reports are publically available online.</p>																				
Principles and issues in assessment / guidance	<table border="0"> <tr> <td><input type="checkbox"/> scientific integrity</td> <td><input checked="" type="checkbox"/> justice / fairness</td> </tr> <tr> <td><input type="checkbox"/> professional integrity</td> <td><input checked="" type="checkbox"/> implications for health and/or safety</td> </tr> <tr> <td><input type="checkbox"/> human subjects research</td> <td><input checked="" type="checkbox"/> implications for quality of life</td> </tr> <tr> <td><input type="checkbox"/> treatment of animals in R&I</td> <td><input checked="" type="checkbox"/> environmental impacts</td> </tr> <tr> <td><input checked="" type="checkbox"/> human dignity</td> <td><input checked="" type="checkbox"/> social impacts</td> </tr> <tr> <td><input checked="" type="checkbox"/> equality / non-discrimination</td> <td><input type="checkbox"/> outsourcing of R&I to developing countries with lower ethics standards</td> </tr> <tr> <td><input checked="" type="checkbox"/> autonomy / freedom</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> implications for civil rights</td> <td><input checked="" type="checkbox"/> dual use (possible military uses)</td> </tr> <tr> <td><input checked="" type="checkbox"/> implications for privacy</td> <td><input type="checkbox"/> other</td> </tr> <tr> <td><input checked="" type="checkbox"/> social responsibility</td> <td></td> </tr> </table> <p>Commentary: Most of the principles and issues mentioned above might be relevant for the Rathenau Institute, particularly when carrying out Technology Assessment. This depends on the topic of research. Scientific integrity and professional integrity are the principles that the Rathenau Institute is currently working on through creating a quality protocol.</p>	<input type="checkbox"/> scientific integrity	<input checked="" type="checkbox"/> justice / fairness	<input type="checkbox"/> professional integrity	<input checked="" type="checkbox"/> implications for health and/or safety	<input type="checkbox"/> human subjects research	<input checked="" type="checkbox"/> implications for quality of life	<input type="checkbox"/> treatment of animals in R&I	<input checked="" type="checkbox"/> environmental impacts	<input checked="" type="checkbox"/> human dignity	<input checked="" type="checkbox"/> social impacts	<input checked="" type="checkbox"/> equality / non-discrimination	<input type="checkbox"/> outsourcing of R&I to developing countries with lower ethics standards	<input checked="" type="checkbox"/> autonomy / freedom		<input checked="" type="checkbox"/> implications for civil rights	<input checked="" type="checkbox"/> dual use (possible military uses)	<input checked="" type="checkbox"/> implications for privacy	<input type="checkbox"/> other	<input checked="" type="checkbox"/> social responsibility	
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<input checked="" type="checkbox"/> social responsibility																					
Self-assessments, strengths and weaknesses	<p>The Rathenau Institute has developed a monitoring system of the impact of their assessment. The information specialist at the department of Communication monitors how many times the Institute is mentioned in the media and in the parliamentary debate.</p> <p>With respect to the strengths of the Rathenau Institute, experience, a multidisciplinary team of academics and communication experts and diversity of expertise are particularly important. Furthermore, the interviewee emphasized the flexibility in using the assessment methods and adapting them to each situation.</p> <p>The Rathenau Institute is perceived as influential opinion-making organization active in the media and in the parliament. The interviewee considers, however, the amount of political impact as a continuous challenge for the Institute. In his opinion, the Institute can always strengthen its impact in the political sphere. The parliament is the Institute's main stakeholder, however the relationship is "loose". Therefore, the Rathenau Institute has to</p>																				

	put a lot of effort in order to connect the parliament's and the Institute's agendas. The challenge is to connect to politicians.
Other	-
Name of organisation	The Rathenau Institute (Het Rathenau Instituut)
Type of organisation	Impact and/or technology assessment organisation
Country	The Netherlands
Website address	General: www.rathenau.nl/en.html Main page(s) on ethics assessment: <ul style="list-style-type: none"> • Technology Assessment: www.rathenau.nl/en/who-we-are/mission/technology-assessment.html • Science System Assessment: www.rathenau.nl/en/who-we-are/mission/science-system-assessment.html
Basic description (organisation and mission)	<p>The Rathenau Institute is an institute of the Royal Dutch Academy of Sciences (KNAW). Its core aim is to study developments in science and technology, analyse their potential impact on society and policy, and to promote a dialogue on issues and dilemmas in science and technology.</p> <p>The Rathenau Institute's mission focuses on two tasks:</p> <ul style="list-style-type: none"> • Stimulating public debate and the formation of political judgments: • This part of the Institute's activity focuses on Technology Assessment (TA), therefore on analysis of technological and scientific developments (new emerging technologies, as well as well-established technologies) and their impact on individuals and society, including new opportunities, risks. • Describing the Dutch science system: <p>The second part of the Institute's activity is Science System Assessment (SciSA) which focuses on the dynamics of science and technology and the organisation of the science system.</p> <p>The Rathenau Institute was established in 1986 by the Ministry of Education, Culture and Science, which also provides funding for the functioning of the Institute. The Rathenau Institute is independent as regards the substance of its work, as it is the Institute that decides on the programme of work.</p>
Interest in research and innovation	The Rathenau Institute studies developments in science and technology. The Technology Assessment division focuses on the societal aspects of technology assessment, the impact on individuals and the society, both

	<p>opportunities and risks. The Institute’s working programme covers a variety of topics e.g. nanotechnology, synthetic biology, the information society, sustainable energy and food systems, cities (smart cities), nature and agriculture (smart farming), the infrastructure of knowledge.</p>
Ethics assessment and/or guidance	<p>Assessment <input checked="" type="checkbox"/> Guidance <input type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> Commentary: The work is mostly ethics assessment and ethical analysis and awareness raising.</p> <p>If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> None <input type="checkbox"/> Other <input type="checkbox"/></p> <p>Commentary: The Institute assesses potential impacts of developments in science and technology on society and policy. Sometimes this includes explorations of ethical issues surrounding science and technology.</p>
Terminology for ethics assessment / guidance	<p>Societal assessment, technology assessment. These are assessment activities that sometimes include ethics assessment. The interviewed member of the Institute’s Technology Assessment division stated that whenever SATORI uses the term “ethical assessment”, the interviewee refers to societal assessment or technology assessment, particularly to the societal aspects of technology assessment.</p>
Name and description of ethics unit(s)	<p>The Institute’s Technology Assessment division may be perceived as engaged in ethics assessment, although the focus is on the social and societal effects of new developments in science and technology.</p>
Aims and motivation for ethics assessment	<p>Science and technology developments play crucial role for the Netherlands innovation strategy. These developments have also a great impact on people’s lives. The Institute contributes to political opinion-forming and decision-making on this issue giving the voice to stakeholders and the public. These developments may bring both opportunities and risks, therefore the Institute works on “technological developments that require new frames of reference, spark public controversy or about which no facts and figures are available”¹⁶¹.</p>
Objects and scope of assessment	<p>The Rathenau Institute assesses general developments in science and innovation through Technology Assessment methods invented by the Institute. The Board of the Institute defines the programme of work reflecting current developments in science and technology giving the voice to the stakeholders and the public. Particular attention is given to public controversy. There are no limitations regarding the objects of assessment. Nevertheless, the main goal is to identify and analyse the potential social and societal impact (ethical, religious, social, economic, legal) of these developments. The Institute acts either at the request of stakeholders or on its own initiative.</p>

¹⁶¹ The Rathenau Institute, Mission: <http://www.rathenau.nl/en/who-we-are/about-the-institute.html>

Beneficiaries of assessment	<p>The institute's mission is to support those who have to take decisions on science and technology at the national level such as MPs, the government, municipalities, policymakers, but also at the European level mostly the European Parliament. The Institute has also a broader circle of stakeholders that includes companies, academic institutions, civil-society organisations and the public at large.</p>
Ethics assessment unit: appointment process	<p>The Rathenau Institute's programme of work is defined by the Board of the Institute. The Chairman and appointees to the Board are formally appointed by the Royal Netherlands Academy of Arts and Sciences (KNAW) and the Scientific Council for Government Policy (WRR), at the nomination of the sitting members of the Board.</p> <p>The Institute consists of multidisciplinary team of academics and communication experts which includes physicists, biologists, statisticians, social scientists, public administration experts and philosophers (in total approximately 100 employees). The Institutes uses also external expertise, e.g. engaging universities. The experts in a specific field are addressed through the institute's network and the media. The experts have to have a practical knowledge on the application of a particular technological solutions.</p>
Procedure for ethics assessment: before	<p>The Institute works either at the request of stakeholders or on its own initiative. In practice, it means that the object of the assessment is related to one of the fields covered in the Rathenau Institute's programme of work or that the objects causes public controversy and concerns.</p>
Procedure for ethics assessment: during	<p>In respect to the methods, the Rathenau Institute does not have one framework of shared values, principles, methods, tools and practices. The Institute works on individual cases on a three step basis. Firstly, they analyse what issue is really at stake. Secondly, the Institute decides on what type of expertise they need. Thirdly, they decide on the methods and tools to be used for the assessment. The interviewee emphasised that the Institute 'invents' its own methods and tools adapting them to an individual case as each case is different. This approach is supported by the years of understanding, intuitions, and experience.</p> <p>The Rathenau Institute makes a lot of effort to connect with stakeholders and the public on order to address their needs and concerns. Therefore, they organise workshops, experts meetings, stakeholders dialogue, public consultations (by focus groups or by questionnaire e.g. on internet). The Rathenau Institute is also active in the media.</p> <p>The Institute's recommendations are not binding. They perceive their role as the advisory position and setting the agenda. The Institute wants to prepare politicians and policy-makers for the upcoming developments.</p>
Procedure for ethics assessment: after	<p>In most of the cases, the assessment is followed by a report including policy recommendations. Each report consists of an introduction chapter,</p>

	<p>a number of content chapters, and conclusion chapters. When the Institute engages external experts, the external experts are responsible for the content chapters, while the Institute prepares introduction chapter, the conclusions and recommendations.</p> <p>The interviewee emphasised that the reports do not have a character of an academic publication, because the main goal of a report is to reach the public. In order to achieve this most of the Rathenau Institute's reports are publically available online.</p> <p>In respect to the monitoring system, the Rathenau Institute has developed an internal monitoring system of the impact of their assessment. The system is based on the information quantity system, indicating how many times the Institute was mentioned in the media and in the parliamentary debate.</p>
Principles and issues in assessment/guidance	<p> <input type="checkbox"/> scientific integrity <input checked="" type="checkbox"/> justice / fairness <input type="checkbox"/> professional integrity <input checked="" type="checkbox"/> implications for health and/or safety <input type="checkbox"/> human subjects research <input checked="" type="checkbox"/> implications for quality of life <input type="checkbox"/> treatment of animals in R&I <input checked="" type="checkbox"/> environmental impacts <input checked="" type="checkbox"/> human dignity <input checked="" type="checkbox"/> social impacts <input checked="" type="checkbox"/> equality / non-discrimination <input type="checkbox"/> outsourcing of R&I to developing <input checked="" type="checkbox"/> autonomy / freedom countries with lower ethics standards <input checked="" type="checkbox"/> implications for civil rights <input type="checkbox"/> dual use (possible military uses) <input checked="" type="checkbox"/> implications for privacy <input type="checkbox"/> other <input checked="" type="checkbox"/> social responsibility </p> <p>Commentary: Most of the principles and issues mentioned above might be relevant for the Rathenau Institute, particularly when carrying out Technology Assessment. This depends on the topic of research. Scientific integrity and professional integrity are the principles that the Rathenau Institute is currently working on through creating a quality protocol.</p>
Self-assessments, strengths and weaknesses	<p>The Rathenau Institute has developed internal monitoring system of the impact of their assessment. The system is based on the information quantity system, indicating how many times the Institute was mentioned in the media and in the parliamentary debate.</p> <p>With respect to the strengths of the Rathenau Institute, experience, a multidisciplinary team of academics and communication experts which includes physicists, biologists, statisticians, social scientists, public administration experts and philosophers and diversity of expertise are</p>

	<p>particularly important. Furthermore, the interviewee emphasised the flexibility in using the assessment methods and adapting them to each situation.</p> <p>The Rathenau Institute is perceived as influential opinion-making organisation active in the media and in the parliament. The interviewee considers, however, the amount of political impact as a weakness of the Institute. In his opinion, the Institute can always strengthen its impact in the political sphere. The parliament is the Institute's main stakeholder, however the relationship is "loose". Therefore, the Rathenau Institute has to put a lot of effort in order to connect the parliament's and the Institute's agendas. The challenge is to connect to politicians.</p>
Other	-

Name of organisation	Royal Dutch Society of Engineers (KIVI) <i>Koninklijk Instituut van Ingenieurs (KIVI)</i>
Type of organisation	Non-assessor / professional organisation
Country	The Netherlands
Website address	<i>General:</i> https://www.kivi.nl/ <i>Main page(s) on ethics assessment:</i> A blog: 'Ethics and Engineers' (https://www.kivi.nl/CM/PAG000007238/Blog--ethiek-en-ingenieurs.html).
Basic description (organisation and mission)	KIVI is the Dutch association for engineers and engineering students. With 20,000 members KIVI is the largest engineering association in the Netherlands. All engineering disciplines are organised within KIVI.
Interest in research and innovation	<p>As the network body for engineers and other highly educated technical professionals in the Netherlands, KIVI's primary objective is to promote the importance of technology in our society. This ensures continuity in adequate investment in education, research and innovation. To meet this objective, KIVI conducts the following core activities:</p> <ul style="list-style-type: none"> • Technical promotion – to promote the role of technology and engineers in general; • Network – to stimulate contacts and exchange of knowledge between engineers;

	<ul style="list-style-type: none"> • Member services – to provide services that assist members with the development of their professional careers. <p>The key issues in KIVI are:</p> <ul style="list-style-type: none"> • Education – quality of higher technical education; • Politics and technology – Solicit attention to technical aspects of topics that get/deserve public attention; • International – international recognition of Dutch professional education and certificates; • Technology-pact – structural attention to technology in primary education; • Technology promotion among the youth. <p>Annual topic 2015: technicians in the valleys of the future.</p> <p>The Netherlands has several innovation valleys (like silicon valley) such as Chemelot (chemistry and materials), de High Tech Campus Eindhoven, Maintenance Valley, Food Valley, Watercampus, Medical Delta, Automotive Campus, Health Valley, Healthy Ageing Campus, Energy Valley, Sensor Valley, Bio Science Park, etc. All initiatives stimulate innovation, often with the objective to stimulate economic activities. KIVI will pay attention that technology will get a prominent role in each of these valleys.</p>
Ethics assessment and/or guidance	Assessment [] Guidance [x] Other [] None [] Commentary: If assessment/guidance is undertaken: In-house [x] Outsourced [] Other [] Commentary: A blog ‘Ethics and Engineers’ (https://www.kivi.nl/CM/PAG000007238/Blog--ethiek-en-ingenieurs.html) (KIVI, 2015). Sessions on ‘philosophy and technology’. Ethical issues are prominent in the list of activities. In the period February – May 2015, seven activities have ‘ethics’ in the title (Ethics and military robots, ... robots, ... healthcare, etc) Code of conduct for their members https://www.kivi.nl/CM/PAG000002804/Gedragcode-2006.html
Terminology for ethics assessment / guidance	N/A
Name and description of ethics unit(s)	KIVI is not engaged in ethics assessment. <i>Ethical Guidance:</i> A confidant can be contacted by members. This person can act as a sounding

	board.
Aims and motivation for ethics assessment	KIVI is not engaged in ethics assessment. It does facilitate a discussion on ethical issues among its members. KIVI also promotes ethical behaviour among its members.
Objects and scope of assessment	<p>KIVI is not engaged in ethics assessment. KIVI does facilitate a discussion on ethical issues among its members. KIVI also promotes ethical behaviour among its members.</p> <p>KIVI brings together engineers from a wide variety of disciplines and professional roles to support them in their work. KIVI offers guidance and a platform for exchange.</p>
Beneficiaries of assessment	Ethical guidance to support the members of KIVI
Ethics assessment unit: appointment process	KIVI is not engaged in ethics assessment.
Procedure for (ethics) assessment: before	KIVI is not engaged in ethics assessment.
Procedure for ethics assessment: during	KIVI is not engaged in ethics assessment.
Procedure for (ethics) assessment: after	KIVI is not engaged in ethics assessment.
Principles and issues in assessment / guidance	<p><input checked="" type="checkbox"/> scientific integrity <input type="checkbox"/> justice / fairness</p> <p><input checked="" type="checkbox"/> professional integrity <input checked="" type="checkbox"/> implications for health and/or safety</p> <p><input checked="" type="checkbox"/> human subjects research <input checked="" type="checkbox"/> implications for quality of life</p> <p><input checked="" type="checkbox"/> treatment of animals in R&I <input checked="" type="checkbox"/> environmental impacts</p> <p><input checked="" type="checkbox"/> human dignity <input checked="" type="checkbox"/> social impacts</p> <p><input type="checkbox"/> equality / non-discrimination <input checked="" type="checkbox"/> outsourcing of R&I to developing</p> <p><input checked="" type="checkbox"/> autonomy / freedom <input checked="" type="checkbox"/> countries with lower ethics standards</p> <p><input checked="" type="checkbox"/> implications for civil rights <input checked="" type="checkbox"/> dual use (possible military uses)</p> <p><input checked="" type="checkbox"/> implications for privacy <input checked="" type="checkbox"/> other, specify:</p>

	[x] social responsibility Commentary: KIVI brings together engineers from very different types of disciplines. From biomedical and military, to automotive and nuclear engineering. Its members therefor touch many different kinds of ethical issues.
Self-assessments, strengths and weaknesses	It does not have strict mechanism to check whether its members act ethically but KIVI does not claim this role either. It does explore and discuss ethical issues with its members.
Other	<i>N/A</i>

Name of organisation	British Psychological Society (BPS)
Type of organisation	National professional association for research professions
Country	United Kingdom
Website address	<i>General:</i> http://www.bps.org.uk/ <i>Main page(s) on ethics and standards:</i> http://www.bps.org.uk/what-we-do/ethics-standards/ethics-standards
Basic description (organisation and mission)	The British Psychological Society (BPS) promotes excellence and ethical practice in the science, education and practical applications of psychology. BPS aims to: <ul style="list-style-type: none"> • Be the learned society and professional body for the discipline • Make psychology accessible to all • Promote and advance the discipline • Be the authoritative and public voice of psychology • Determine and ensure the highest standards in their activities They do this by: <ul style="list-style-type: none"> • Supporting their members' careers and professional development • Providing information to the public • Increasing the awareness and influence of psychology in society • Rising standards of education, training and practice

	<ul style="list-style-type: none"> • Organising conferences and events • Publishing • Recognising excellence in the science and practice of psychology • Setting standards in psychological testing • Preserving and recognising the history of psychology <p>Strong links with AfRE Association for Research Ethics</p> <p>http://s3.spangfish.com/s/21217/documents/independent-membership/12-11-13-framework-complete.pdf</p> <p>European Federation of Psychologists' Associations:</p> <p>http://www.efpa.eu/ethics/meta-code-of-ethics-</p> <p>The Academy of Social Sciences:</p> <p>http://acss.org.uk/developing-generic-ethics-principles-social-science/</p> <p>Professor John Oates (interviewee) is a Fellow of the Academy of Social Sciences and member of the Academy's Research Ethics Group, Member of Advisory Group for ESCRC Framework for Research Ethics, Council Trustee of the Association for Research Ethics (AfRE).</p>
Interest in research and innovation	<p>The BPS aims to promote and advance the discipline of psychology and to develop, promote and apply pure and applied psychology for the public good. The BPS is the only body in the UK that covers all areas of psychology.</p>
Ethics guidance	<p>Assessment [<input type="checkbox"/>] Guidance [<input checked="" type="checkbox"/>] Other [<input type="checkbox"/>] None [<input type="checkbox"/>] Commentary: <i>Ethical guidance for professional conduct</i></p> <p>If assessment/guidance is undertaken: In-house [<input checked="" type="checkbox"/>] Outsourced [<input type="checkbox"/>] Other [<input type="checkbox"/>]</p> <p>Commentary: The British Psychological Society provides ethics guidance to psychology members of the BPS who are engaged in research. The BPS also works to encourage other researchers engaged in human research. The Code of Ethics and Conduct - which is the overarching code - deals with professional roles in providing therapeutic interventions and deals with issues regarding working with clients and patients. The Code of Human Research Ethics provides a set of general principles that are applicable to all research contexts and cover research with human participants.</p>
Terminology	<p>Ethics guidance</p>
Name and description of ethics unit(s)	<p>Webpage on Ethics & standards</p>
Aims and motivation for ethics guidance	<p>From monitoring complaints and ethical enquiries, the Society's Ethics Committee identified a need for a code - the Code of Ethics and Conduct (2009) which gave more emphasis on, and support to, the process of ethical</p>

	<p>decision making. The Code of Human Research Ethics sets out a set of general principles that are applicable to all research contexts and are intended to cover all research with human participants.</p> <p>The principles outlined in this Code of Human Research Ethics supplement the general ethics principles in the Society's Code of Ethics and Conduct. Both sets of principles are tools for making reasoned judgement.</p>
Objects and scope of guidance	Please see "Ethics guidance" section above.
Beneficiaries of guidance	Psychology members of the BPS who are engaged in research, teachers and practitioners.
Ethics committee: appointment process	<p>The Ethics Committee is a Standing Committee of the Board of Trustees. It promotes the ethical practice of psychology and is responsible for the Code of Ethics and Conduct and other ethical guidance within the Society. The Ethics Committee does not carry out any ethics review or assessment. The Ethics Committee was selected on two bases. One, different sections of the society nominate members - the BPS is a huge society and representatives of various sub-bodies of the BPS cover a wide range of psychologies. Two, members with particular expertise and backgrounds are co-opted onto the Committee.</p> <p>Queries about research ethics that cannot be answered by reference to the Code of Human Research Ethics Code or the additional guidance on the Society website, can be addressed to the Society's Research Ethics Reference Group. Again, this group does not carry out ethics assessment.</p>
Procedure for ethics assessment: before	N/A
Procedure for ethics assessment: during	N/A
Procedure for ethics assessment: after	N/A
Principles and issues in guidance	<p><input checked="" type="checkbox"/> scientific integrity <input type="checkbox"/> justice / fairness</p> <p><input type="checkbox"/> professional integrity <input type="checkbox"/> implications for health and/or safety</p> <p><input type="checkbox"/> human subjects research <input type="checkbox"/> implications for quality of life</p> <p><input type="checkbox"/> treatment of animals in R&I <input type="checkbox"/> environmental impacts</p> <p><input checked="" type="checkbox"/> human dignity <input type="checkbox"/> social impacts</p> <p><input type="checkbox"/> equality / non-discrimination <input type="checkbox"/> outsourcing of R&I to</p>

	<p>developing</p> <p>[] autonomy / freedom countries with lower ethics standards</p> <p>[] implications for civil rights [] dual use (possible military uses)</p> <p>[x] implications for privacy [x] other, specify: respect for autonomy, maximising benefit and minimising harm and competence</p> <p>[x] social responsibility</p> <p>Commentary: Their core principle is “thinking is not optional”. This statement reflects recognition of the fact that every ethics issue is located in a specific context. Four principles provide top-level guidance. The principles are respect for autonomy, privacy and dignity of individuals and communities, scientific integrity, social responsibility and maximising benefit and minimising harm.</p> <p>Most important ethical problems in research and innovation: Risk assessment and supporting researchers in thinking about risks is a major challenge. The society is moving towards virtue ethics because this approach recognises the breadth and variety of ethics issues through all phases of research from inception through to dissemination and application.</p>
Self-assessments, strengths and weaknesses	<p>Assessment of impact of ethics guidance: The first edition of the Code of Human Research Ethics was well-received – the BPS has received informal comments that the Code works well. The Ethics Committee has recently revised the Code (light touch review) to check that the Code still works. The most important revision involved changing the focus from individual research participants to communities (the research impact can be broader than that experienced solely by an individual). The Committee has also changed the second principle from scientific value to scientific integrity.</p>
Other	

Name of organisation	Center for Engineering Ethics and Society (CEES) at the National Academy of Engineering (NAE)
Type of organisation	National research ethics committee
Country	USA
Website address	General: http://www.nae.edu/ Main page(s) on ethics assessment: http://www.nae.edu/Projects/CEES.aspx

	http://www.onlineethics.org/
Basic description (organisation and mission)	<p>The National Academies is an US organisation of four academies that gives independent advice on a wide range of issues. The National Academy of Engineering (NAE) is a member of the National Academies.</p> <p>[...] NAE is a private, independent, non-profit institution that provides engineering leadership in service to the nation. The mission of the National Academy of Engineering is to advance the well-being of the nation by promoting a vibrant engineering profession and by marshalling the expertise and insights of eminent engineers to provide independent advice to the federal government on matters involving engineering and technology.¹⁶²</p> <p>CEES is a NAE program. A part of its mission is:</p> <p>CEES activities address ethically significant issues that arise in engineering and scientific research, education, and practice. These issues arise for individual engineers and scientists as well as for social organisations and institutions. CEES projects engage a wide audience to help improve ethics education and enhance social responsibility in engineering and science.¹⁶³</p> <p>CEES was founded in 2007 by the NAE.</p>
Interest in research and innovation	<p>Former NAE president Wm. A. Wulf encouraged the NAE to address the social responsibilities of engineering in the face of increasing complexity and accelerating environmental and societal change and innovation¹⁶⁴. This included transfer of the Online Ethics Centre. This is a website that previously focused on educational activities within engineering and research ethics, by providing e.g. case studies. CEES has however received funding from the National Science Foundation to expand the website to include educational ethics material for all the sciences under the National Science Foundation.</p>
Ethics assessment and/or guidance	<p>Assessment <input type="checkbox"/> Guidance <input checked="" type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> Commentary: CEES primarily provides guidance for engineering educators and students. The interviewee noted that ethics assessments are not performed at CEES or even in the US in general beyond assessment done, in order to clarify whether government requirements are being followed.</p> <p>If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input type="checkbox"/> Other <input type="checkbox"/></p> <p>Commentary: CEES uses material produced in-house and by a number of collaborators.</p>

¹⁶² <https://www.nae.edu/About.aspx>

¹⁶³ <http://www.nae.edu/26187.aspx>

¹⁶⁴ <http://www.nae.edu/Projects/CEES/106421.aspx>

Terminology for ethics assessment / guidance	CEES bases their considerations on engineering ethics. Engineering ethics makes use of principles also found in biomedical ethics, e.g. principles from the Belmont report. Of additional influence are professional ethics codes of conduct.
Name and description of ethics unit(s)	The Center for Engineering Ethics and Society (CEES) is a NAE program and has four employees, but draws upon the resources of NAE. CEES is supported financially by The National Science Foundation and Innovyze (a private company).
Aims and motivation for ethics assessment	CEES seeks to improve ethics education and enhance social responsibility in engineering and science.
Objects and scope of assessment	CEES activities seeks to address ethically significant issues that arise in engineering and scientific research, education and practice. ¹⁶⁵
Beneficiaries of assessment	The primary beneficiaries of CEES activities are engineering and science students, educators and researchers. Projects might also address the public or policymakers.
Ethics assessment unit: appointment process	N/A
Procedure for ethics assessment: before	The projects are usually requested by an agency or an organisation on a topic of public concern. In some cases projects are carried out for public or private foundations. Almost all requests are accepted, but may be altered by the CEES through negotiation with the requester of the project. Research proposals and programs are usually not assessed.
Procedure for ethics assessment: during	<p>The CEES does not have a formalised way of doing ethics assessments, nor a standardised set of principles. CEES usually do not conduct original research for their projects, but frame already existing research and provide recommendations relevant for the public and policymakers.</p> <p>For every project, a committee either advises CEES or in the case of consensus committee actually produces the resulting report. Increasingly CEES are creating websites or conducting workshops instead of creating consensus committees. The participants of a workshop depend on what the project addresses.</p> <p>An important example of a website is onlineethics.org. Here five Content Editorial Boards reviews and guides the content collection. The participants of the content working groups are volunteers and typically members of the NAE with a background in engineering, science and technology studies or</p>

¹⁶⁵ <http://www.nae.edu/26187.aspx>

	from the ethics communities.
Procedure for ethics assessment: after	<p>From workshops, CEES will often produce summaries, which states suggestions from individual speakers, but are not recommendations from NAE.</p> <p>For CEES to make formal recommendations they have to work with a consensus committee of experts, where a report has to go through a review process. The review is external and is up to 20 people and their staff. The committee reviews the report and has to respond to every criticism, before the report can be published and recommendations made. In the case of a consensus report, a consensus committee actually produces the resulting report.</p>
Principles and issues in assessment / guidance	<p>[x] scientific integrity [x] justice / fairness</p> <p>[x] professional integrity [x] implications for health and/or safety</p> <p>[x] human subjects research [x] implications for quality of life</p> <p>[x] treatment of animals in R&I [x] environmental impacts</p> <p>[x] human dignity [x] social impacts</p> <p>[x] equality / non-discrimination [] outsourcing of R&I to developing</p> <p>[x] autonomy / freedom countries with lower ethics standards</p> <p>[x] implications for civil rights [x] dual use (possible military uses)</p> <p>[x] implications for privacy [x] other, specify: Employment issues¹⁶⁶</p> <p>[x] social responsibility</p> <p>Commentary: The above notes ethical principles that might be relevant for CEES. The actually applied ethical principles depend on the project. To see the diversity of topics CEES addresses, see www.onlineethics.org.</p>
Self-assessments, strengths and weaknesses	<p>The primary strength of ethics assessment in engineering, are the strong professional codes of conduct, which professionals can look to concerning e.g. safety. The primary weakness is the difficulty of predicting the outcomes of works of engineering and technology. Due to the difficulties in predicting the outcomes, it is hard to engage engineers to think about this. This means the engineers will not invest the time. In general, engineers do not have much focus on social sustainability or the implications of technology.</p>

¹⁶⁶ <http://onlineethics.org/Topics/LegalIssues.aspx>

	The impact of onlineethics.org is studied through online analytics data. CEES do not measure the impacts quantitatively for other projects than onlineethics.org. The overall advisory group ¹⁶⁷ would however prefer that more qualitative impacts were known.
Other	N/A

Name of organization	Research Ombudsman (<i>Ombudsman für die Wissenschaft</i>)
Type of organization	Ethics Assessors/other, Germany Country Study
Country	Germany
Website address	<p><i>General:</i></p> <ul style="list-style-type: none"> Research Ombudsman <p>http://www.ombudsman-fuer-die-wissenschaft.de/</p> <p><i>Main page(s) on ethics assessment:</i></p>
Basic description (organization and mission)¹⁶⁸	<p>The Research Ombudsman (<i>Ombudsman für die Wissenschaft</i>) is an independent committee that provides assistance to all researchers in questions involving good scientific practice and scientific misconduct. Formerly, the committee was named the “Ombudsman of the DFG”, because it was established in 1999 by the Senate of the German Research Foundation (<i>Deutsche Forschungsgemeinschaft</i>, DFG). The institution was established as a response for a recommendation by an international commission on professional self-regulation in science. In 2010, the DFG Senate changed the name of the committee to reflect the clear differentiation between the Research Ombudsman and the DFG’s Committee of Inquiry on Allegations of Scientific Misconduct. The goal is to provide more transparency and clarity regarding the committees’ distinct procedures. The Research Ombudsman can be contacted directly, irrelevant of any connection to the DFG.</p>
Interest in research	The Research Ombudsman investigates reports of alleged scientific

¹⁶⁷ For a list of members of the overall advisory group, see: <http://www.nae.edu/26187.aspx>

¹⁶⁸ Based on the information about the Research Ombudsman on the DFG website, http://www.dfg.de/en/research_funding/principles_dfg_funding/good_scientific_practice/ombudsman/index.html

and innovation	misconduct by anyone directly or indirectly involved in scientific research.
Ethics assessment and/or guidance	Assessment <input checked="" type="checkbox"/> Guidance <input checked="" type="checkbox"/> Other <input type="checkbox"/> None <input type="checkbox"/> Commentary: If assessment/guidance is undertaken: In-house <input checked="" type="checkbox"/> Outsourced <input checked="" type="checkbox"/> Other <input type="checkbox"/> Commentary: In case the members of the body do not have an expertise in a specific field, the Research Ombudsman may engage external referees for a particular case.
Terminology for ethics assessment / guidance	The Research Ombudsman does not use the term “ethics assessment”, but refers to “the assessment of scientific misconduct”.
Name and description of ethics unit(s)	Not relevant.
Aims and motivation for ethics assessment	The body has been initiated by the German Research Council as a reaction for a scandal of research fraud by internationally well-known and highly renowned scientists in cancer research in 1997. ¹⁶⁹ The scientists had been funded by the DFG. As the result, the DFG convened and installed an Executive Committee to investigate this case of severe scientific misconduct. The Committee consisted of international experts and was entrusted with investigating the causes of improbity in the research system, discussing preventive countermeasures, and verifying and safeguarding existing mechanisms for scientific self-regulation. The results were published as recommendations for “Safeguarding Good Scientific Practice”. The document serves as a reference point for the Research Ombudsman and is an integral part of the activities of scientists in Germany. The Research Ombudsman is responsible for safeguarding standards of good scientific practice. In cases of scientific misconduct, the ombudsman is the point of contact for all researchers in Germany and can advise and assist them in conflict situations.
Objects and scope of assessment	The German Ombudsman has two different kinds of responsibilities: 1. The Research Ombudsman investigates reports of alleged scientific

¹⁶⁹ See e.g. Brigitte M. Jockusch, „Handling Allegations of Research Misconduct: Lessons from the German Ombudsman”, presented at the Symposium “Research Integrity & Responsible Conduct of Research - New Challenges in a Turbulent World“, Aarhus University, April 17, 2013, http://www.au.dk/fileadmin/www.health.au.dk/Medarbejdere.health.au.dk/Ansvarlig_forskning_spraksis/Brigitte_M_Jockusch_01.pdf.

	<p>misconduct by anyone involved in scientific research. The body serves as “Justice of the Peace” for conflict parties.</p> <p>2. The Research Ombudsman has also a more general role of supervising ethical behavior, serving as General Guardian of Good Scientific Practice (GSP).</p> <p>The German Research Ombudsman is concerned with all fields of science. The most frequent cases are situations when whistle blowers accuse defendants of fraud (plagiarism, fabricating results), inadequate mentorship (inadequate sponsorship, abuse of authority), and authorship manipulations.</p>
Beneficiaries of assessment	<p>The body is available to all scientists and academics, in an advisory and supporting capacity.</p>
Ethics assessment unit: appointment process	<p>The Research Ombudsman is a national three-member body of elected scientists. It is elected by the German Research Council. The Senate of the German Research Council makes a proposal to the President of the German Research Council, who invites particular candidates. The body should represent different scientific fields, mainly law, life sciences (medicine, biomedicine), and natural sciences. In some cases, where the Research Ombudsman do not have a particular expertise, the body relies on external reviewers. However, in these situations both parties, a whistle blower and a defendant, need to give their consent.</p> <p>The position of the member of the Research Ombudsman is a honorary position; the members are not paid. This also ensures the independence of the members. The members of the committee cannot have another position that could cause a conflict of interests.</p>
Procedure for ethics assessment: before	<p>The document “Memorandum of Safeguarding Good Scientific Practice” is a reference point for the Research Ombudsman in terms of good scientific practice. The document comprises 17 proposals, called “recommendations”, for individual persons and scientists, for the scientific community and for research institutions (universities and non-universities)-</p> <p>In case of justified initial suspicion of serious scientific misconduct, the Research Ombudsman hands over the case that is related to the DFG to the DFG Head Office for an informal preliminary investigation and a formal process involving the Committee of Inquiry</p>

	on Allegations of Scientific Misconduct (<i>Unterausschuss für Fehlverhaltensangelegenheiten</i>). ¹⁷⁰ Furthermore, also if there is no reference to the DFG, the Ombudsman in case of justified initial suspicion of serious scientific misconduct can recommend the implementation of a formal investigation procedure to the concerned institution of science.
Procedure for ethics assessment: during	The role of the Research Ombudsman is to sort out the justification to follow the query into a case, the allegations of the whistle blower, and the allegations of the defendant. In case of legal consequences, the body notifies the relevant board for imposing sanctions. The body aims to bring the whistle blower and the defendant together. The intention is always to find an agreement between both sides. If the conflict cannot be solved by written, phone, or mail arguments, the Ombudsman arranges for a personal consultation. ¹⁷¹ On the base of investigation, the Research Ombudsman makes a decision, that can comprise of ¹⁷² <ul style="list-style-type: none"> • a proposal agreeable to both parties based on the proposals for safeguarding Good Scientific Practice • a statement to either party of wrong behaviour, e.g. false accusations from the whistle blower or misconduct of the defendant.
Procedure for ethics assessment: after	The decision of the Research Ombudsman is binding. Researchers at most scientific institutions in Germany are bound to the rules of good scientific practice, as these intuitions adopted the rules of the DFG to their own institutional rules. The imposition of sanctions is not the task of the Research Ombudsman. In case of justified initial suspicion on scientific misconduct, the body forwards the case to the competent commission of inquiry, which all universities and non-university research institutions have in accordance with the DFG memorandum. These commissions have a legal mandate for imposing sanctions for scientific misconduct. If the research was funded by the DFG, the DFG carries out a two-step procedure to ascertain scientific

¹⁷⁰ DFG, The DFG Process in Detail, http://www.dfg.de/en/research_funding/principles_dfg_funding/good_scientific_practice/dfg_process_in_detail/index.html

¹⁷¹ Brigitte M. Jockusch, “Handling Allegations of Research Misconduct: Lessons from the German Ombudsman”, presented at the Symposium “Research Integrity & Responsible Conduct of Research - New Challenges in a Turbulent World“, Aarhus University, April 17, 2013, http://www.au.dk/fileadmin/www.health.au.dk/Medarbejdere.health.au.dk/Ansvarlig_forskning_spraksis/Brigitte_M_Jockusch_01.pdf.

¹⁷² Ibid.

	<p>misconduct: an informal preliminary investigation by the DFG Head Office and a formal process involving the Committee of Inquiry on Allegations of Scientific Misconduct.¹⁷³ This Committee presents the results of its investigation and its recommendation to the Joint Committee.¹⁷⁴ However, if the allegation of scientific misconduct is being examined simultaneously by a university/non-university ombudsman and/or through university/non-university proceedings, the DFG investigation should be initiated and usually suspended until the other procedure has concluded.¹⁷⁵ If the suspicion of the scientific misconduct by individuals is confirmed in an investigation conducted by the Research Ombudsman, the Research Ombudsman passes the inquiry to the DFG Head Office.¹⁷⁶</p> <p>The Research Ombudsman compiles an annual report on its activities that is presented to the German Research Council Senate and to the public.</p>
Principles and issues in assessment / guidance	<p><input checked="" type="checkbox"/> scientific integrity <input type="checkbox"/> justice / fairness</p> <p><input type="checkbox"/> professional integrity <input type="checkbox"/> implications for health and/or safety</p> <p><input type="checkbox"/> human subjects research <input type="checkbox"/> implications for quality of life</p> <p><input type="checkbox"/> treatment of animals in R&I <input type="checkbox"/> environmental impacts</p> <p><input type="checkbox"/> human dignity <input type="checkbox"/> social impacts</p> <p><input type="checkbox"/> equality / non-discrimination <input type="checkbox"/> outsourcing of R&I to developing countries with lower ethics standards</p> <p><input type="checkbox"/> implications for civil rights <input type="checkbox"/> dual use (possible military uses)</p> <p><input type="checkbox"/> implications for privacy <input type="checkbox"/> other, specify:</p> <p><input type="checkbox"/> social responsibility</p>

¹⁷³ DFG, The DFG Process in Detail, http://www.dfg.de/en/research_funding/principles_dfg_funding/good_scientific_practice/dfg_process_in_detail/index.html

¹⁷⁴ Ibid.

¹⁷⁵ DFG's Joint Committee, Rules of Procedure for Dealing with Scientific Misconduct, adopted on October 2001 and amended by the Joint Committee on 5 July 2011, [p. 5], http://www.dfg.de/formulare/80_01/80_01_en.pdf

¹⁷⁶ Ibid.

	<p>Commentary: The Research Ombudsman has its own procedural guidelines, which are based on confidentiality, fairness, and transparency.</p> <p>A reference point for the Research Ombudsman and all scientists in Germany is the document “Safeguarding Good Scientific Practice”. It comprises 17 proposals with recommendations for individuals, research institutions (Universities as well as non-Universities), and authors.</p> <p>In 2013, the document was revised.</p>
Self-assessments, strengths and weaknesses	
Other	