
The role of advisory bodies in environmental health policymaking

A comparative research project in France, Germany and Poland



Preface

Over the past two years the Health Council has been busy strengthening its contacts with its European sister organisations with a view to establishing a European network of national science advisory bodies in the public health field. In view of this initiative of the Health Council of the Netherlands, a comparative research project regarding the role of national science advisory bodies in environmental health policymaking was performed by Eva Kunseler, student Environmental Health Sciences at Maastricht University. The report at hand is the result of this research project.

The main aim of the research project was to explore the role of science advisory bodies in national environmental health policymaking. The second aim was to explore the desirability and possibility of bilateral co-operation and networking among a European network of national science advisory bodies at a European level.

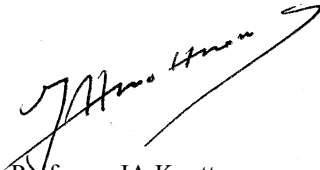
The research project showed that a distinction can be made between research oriented science advisory bodies, which produce scientific data based on research findings, and policy-oriented science advisory bodies which provide policymakers with scientific knowledge in its social context.

The (staff) members of advisory bodies that were consulted acknowledged the value of intensifying bilateral co-operation and establishing a European network for national science advisory bodies. Existing transnational contacts between members of advisory bodies is largely based on informal personal con-

tact. Those members of the advisory bodies that were interviewed are keen to participate in a European network of national science advisory bodies.

This research project provided the Health Council of the Netherlands with valuable information regarding the science advisory bodies in the selected European countries and their working methods. It confirmed the need for- and the advantages of a more collaborative approach to science advice at the national and European level. As continuation, the Health Council of the Netherlands hosted an invitational meeting in September 2005 in which several players in the field of public health discussed the topic of science advice on public health in Europe on the basis of a discussion paper of the Health Council.¹ Those present at the meeting supported the initiative to strengthen collaboration between national science advisory bodies in Europe.

Therefore the Health Council of the Netherlands decided, in cooperation with its Belgian counterpart, the Health Council of Belgium, to establish a European Science Advice Network for Health (EuSANH). Around 12 organisations will be invited for the first meeting of EuSANH in September 2006.

A handwritten signature in black ink, appearing to read 'JA Knottnerus', with a long, sweeping underline that extends to the right.

Professor JA Knottnerus,
President of the Health Council of the Netherlands



The role of advisory bodies in environmental health policymaking

A comparative research project in France, Germany and Poland

to:

the Minister of Health, Welfare and Sport

the State Secretary of Housing, Spatial Planning and the Environment

No. A06/03E, The Hague, May 16, 2006

The Health Council of the Netherlands, established in 1902, is an independent scientific advisory body. Its remit is “to advise the government and Parliament on the current level of knowledge with respect to public health issues...” (Section 21, Health Act).

The Health Council receives most requests for advice from the Ministers of Health, Welfare & Sport, Housing, Spatial Planning & the Environment, Social Affairs & Employment, and Agriculture, Nature & Food Quality. The Council can publish advisory reports on its own initiative. It usually does this in order to ask attention for developments or trends that are thought to be relevant to government policy.

Most Health Council reports are prepared by multidisciplinary committees of Dutch or, sometimes, foreign experts, appointed in a personal capacity. The reports are available to the public.

This report can be downloaded from www.healthcouncil.nl.

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Executive summary

This thesis considers the role of French, German and Polish advisory bodies in the national environmental health policymaking process. An advisory body is defined as an independent statutory body, whose tasks include advising the legislature or government (departments) at national level about the current state of knowledge on environmental health matters.

Motivation and aims

The Health Council of the Netherlands, an independent advisory body to the Dutch Parliament and several ministries, has commissioned a comparative research project about other advisory bodies in EU member states. This research project allowed the attitude of other advisory bodies towards the Health Council's initiative to establish a 'European expertise network for science advice on public health' to be assessed. The scientific basis for the research project originates from previous case studies on advisory bodies, which recommend the in-depth study into how advisory bodies operate, and from discussions in literature regarding science and policy interactions. The thesis has two aims, which derive from these motivations.

The main objective of the thesis is to explore the role of advisory bodies in national policymaking, focusing on the effects of advisory reports in the environmental health policymaking process.

The second aim of the thesis is to explore the value of bilateral co-operation and networking among national advisory bodies at a European level.

Scientific and practical background

In-depth case studies conducted at twelve advisory bodies in France, Germany and Poland produced qualitative findings about the operation of these advisory bodies in the context of their advisory system and political organization. The findings mainly resulted from the data collected via questionnaires and interviews with scientific staff and expert members of the participating advisory bodies. An extensive selection procedure has been applied in order to decide the three EU member states, the four advisory bodies in each country and the appropriate spokespersons at the advisory bodies that will participate in the research project. The comparative in-depth analyses of the findings have been linked to theoretical findings that are described in the theoretical framework.

The point of departure for the theoretical framework is broad descriptions of the concept of policymaking and two concepts of science, resulting in a focused explanation on the operating procedure of advisory bodies. The two concepts of science are normal science and post-normal science: normal science focuses on the production of scientific data, while post-normal science is aimed at producing scientific knowledge in its societal context. From the viewpoint of policymakers, the input of scientific knowledge in policymaking is useful for legitimating and rational reasons that are reflected in five policy-supportive functions for scientific experts. In addition, the role of scientific knowledge in policymaking has been described as being dependent from the policy style within a country. Three approaches towards the mutual relationship between science and policy have been discussed. Interlinking these approaches with a convergent or a divergent operating code has resulted in interaction arrangements between scientific experts and policymakers, ranging from a technocratic model to a bureaucratic model. The intermediating position of advisory bodies on the boundary of science and policy has been explained by the concept of boundary work and their involvement in the risk assessment process.

In order to use the theoretical framework for analyzing the findings of the comparative research project, the literature discussed has been summarized in a characterization framework. This framework includes four characteristics: (1) the concept of science, (2) the function of science in policymaking, (3) the interaction between science and policy and (4) the operation of advisory bodies. Furthermore, six research questions have been derived from the theoretical findings.

Results and Conclusion

The findings from the comparative research project at advisory bodies in France, Germany and Poland have been analyzed according to five criteria, that is (1) the advisory system in the policy context, (2) the organization and composition of advisory bodies, (3) the operational procedure of advisory bodies, (4) the effects of advisory reports on environmental health policymaking, and (5) bilateral cooperation and networking at a European level. After describing the findings from the research project in each of the three countries, the results have been compared across the cases and have been assessed against the theoretical findings.

The conclusion describes the consequent comparisons of the advisory bodies in France, Germany and Poland, which link the results of the research project to the four characteristics of the characterization framework. The operating context of advisory bodies in France, Germany and Poland has been characterized through findings about the interaction between science and policy and findings about the policy style. It has been concluded that French advisory bodies operate in the context of an adversarial policy style, according to a bureaucratic interaction model. Only the two French advisory bodies that include policymakers and legislators as full members are able to surpass the wheels of the French government and can contribute to policy learning and progress. The findings in Germany reveal the opposite operating context. In the corporatist political system of Germany, it is the German advisory bodies who are the initiators of the science/policy interaction process. The technocratic model illustrates the relationship between German advisory bodies and policymaking authorities. Furthermore, the advocacy models also apply to the two German scientific advisory councils, since they contribute to agenda setting and therefore interact with policymaking authorities to a higher extent than the others. The political system in Poland demonstrates a fiduciary policy style. Accordingly, Polish advisory bodies are recruited to produce advisory reports on the basis of a contracting system, which is reflected by the engineering model. This is however different for the Polish science advisory council, which operates according to the technocratic approach.

The conclusion about the role of the French, German and Polish advisory bodies in the environmental health policymaking process has been derived from the characteristics regarding their operating procedure and their interpretation of science. Two types of advisory bodies have been defined; (1) research-oriented advisory bodies the role of which is to produce scientific data based on research findings and (2) policy-oriented advisory bodies whose role is to provide policymakers with scientific knowledge in its societal context. Although there are

exceptions, the functioning of research-oriented advisory bodies corresponds with normal science, while policy-oriented advisory bodies practice post-normal science. In association with their interpretation of science, both types of advisory bodies exert different functions on the policymaking process. Moreover, the concept of boundary work is regarded as a constructing process at research-oriented advisory bodies whereas policy-oriented advisory bodies believe the boundary between scientific and non-scientific considerations needs to be coordinated. By engaging in boundary work, both research-oriented and the majority of the policy-oriented advisory bodies are able to guarantee the scientific quality of their advisory reports.

The conclusion results in the following two recommendations regarding advisory bodies operating in the domain of environmental health:

- Advisory bodies should operate according to rules of procedure in order to maintain their status as independent and scientific operating bodies.
- Regarding transnational advisory topics, advisory bodies should intensify their level of co-operation with similar institutions on a European level.

Samenvatting

In deze scriptie wordt de rol van adviesorganen bij de totstandkoming van nationaal milieugezondheidsbeleid in Frankrijk, Duitsland en Polen onder de loep genomen. Een adviesorgaan is gedefinieerd als een onafhankelijk statutair orgaan, wiens taak het is om de wetgevende macht of de regering en haar ministeries te adviseren over de huidige stand van de wetenschap betreffende milieugezondheidskwesties.

Motivatie en doelstellingen

De Gezondheidsraad, een onafhankelijk adviesorgaan voor het Nederlandse parlement en verscheidene ministeries, heeft de opdracht gegeven voor de uitvoering van een vergelijkend onderzoek bij andere adviesorganen in EU lidstaten. Middels dit onderzoeksproject was het mogelijk om de houding van andere adviesorganen te peilen aangaande het initiatief van de Gezondheidsraad voor de oprichting van een '*European expertise network for science advice on public health*'. De wetenschappelijke achtergrond van het onderzoeksproject is gebaseerd op aanbevelingen voor een dieptestudie naar de werkwijze van adviesorganen, afkomstig van voorgaande dieptestudies, en op discussies in de literatuur aangaande wetenschap en beleid interacties. De motivaties voor uitvoering van een vergelijkend onderzoek bij adviesorganen resulteren in twee doelstellingen.

De hoofddoelstelling die aan het onderzoek ten grondslag ligt, luidt: een verkenning van de rol van adviesorganen in het nationale beleidsvormingsproces,

gericht op de invloed van adviesrapporten bij de totstandkoming van milieugezondheidsbeleid.

De tweede doelstelling betreft een verkenning van het belang van bilaterale samenwerking en netwerken tussen nationale adviesorganen op Europees niveau.

Wetenschappelijke en praktische achtergrond

De uitvoering van dieptestudies bij twaalf adviesorganen in Frankrijk, Duitsland en Polen resulteerde in kwalitatieve bevindingen omtrent de werkwijze van deze adviesorganen in de context van het adviessysteem en het politieke stelsel. De bevindingen zijn hoofdzakelijk gebaseerd op dataverzameling middels vragenlijsten en interviews met wetenschappelijke (staf)leden. De selectie van de drie EU lidstaten, de vier nationale adviesorganen en de geschikte woordvoerders binnen de adviesorganen, is gebaseerd op een uitvoerige selectieprocedure. De vergelijkende diepte analyses van de bevindingen zijn geverifieerd met de theoretische bevindingen, die beschreven staan in het theoretische kader.

Het theoretische kader vangt aan met een omschrijving van beleidsvorming en twee denkbeelden over wetenschap en mondt uit in een specifieke toelichting op de werkwijze van adviesorganen. De twee denkbeelden over wetenschap zijn normale wetenschap en postnormale wetenschap – normale wetenschap richt zich op de productie van wetenschappelijke data, terwijl postnormale wetenschap tot doel heeft om wetenschappelijke kennis in zijn maatschappelijke context te plaatsen. Het verzoek van beleidsmakers om inbreng van wetenschappelijke kennis bij beleidsvorming is gebaseerd op legitimerende en rationele overwegingen. Op grond hiervan zijn vijf beleidsondersteunende functies voor adviesorganen gedefinieerd. Tevens is beschreven dat de rol van wetenschappelijke kennis bij beleidsvorming afhankelijk is van de nationale beleidsstijl. Drie benaderingen omtrent de onderlinge verhouding tussen wetenschap en beleid zijn besproken. Deze benaderingen zijn afgezet tegen een convergente of divergente werkstijl, resulterend in interactiearrangementen tussen wetenschappelijke experts en beleidsmakers, uiteenlopend van een technocratisch tot een bureaucratisch model. De tussenliggende positie van adviesorganen op de grens van wetenschap en beleid is verklaard met behulp van het concept grenzenwerk en het proces van risicoschatting.

De theoretische bevindingen zijn samengevat in een karakteriseringschema om een analyse van de onderzoeksbevindingen mogelijk te maken. Het schema bevat vier kenmerken, namelijk (1) het denkbeeld van wetenschap, (2) het belang van wetenschap bij beleidsvorming, (3) de interactie tussen wetenschap en beleid

en (4) de werkwijze van adviesorganen. Daarnaast zijn zes onderzoeksvragen afgeleid van de theoretische bevindingen.

Resultaten en conclusie

De resultaten van het vergelijkend onderzoek bij adviesorganen in Frankrijk, Duitsland en Polen zijn geanalyseerd aan de hand van vijf thema's: (1) het adviessysteem in de beleidscontext, (2) de organisatie en samenstelling van adviesorganen, (3) de werkwijze van adviesorganen, (4) de invloed van adviesrapporten bij de totstandkoming van het milieugezondheid beleid en (5) bilaterale samenwerking en netwerken op Europees niveau. De resultaten zijn voor de drie landen afzonderlijk beschreven, gevolgd door een kruisvergelijking van de resultaten tussen de casussen en een vergelijking met de theoretische bevindingen.

In de conclusie zijn de resulterende vergelijkingstabellen van de adviesorganen in Frankrijk, Duitsland en Polen weergegeven, waarbij de onderzoeksresultaten tegen de vier kenmerken van het karakteriseringschema zijn afgezet. De bevindingen aangaande de interactie tussen wetenschap | beleid en de nationale beleidsstijl maken het mogelijk om de werkwijze van adviesorganen in Frankrijk, Duitsland en Polen te karakteriseren. Geconcludeerd is dat Franse adviesorganen in de context van een conflictueuze beleidsstijl opereren, volgens een bureaucratisch interactiemodel. De Franse adviesorganen, die beleidsmakers en wetgevers als volledig lid erkennen, zijn in staat de Franse overheidsmolen te overstijgen om vervolgens bij te dragen aan beleidslering en progressie. De Duitse adviesorganen opereren in een geheel andere context. Het Duitse corporatistische politieke stelsel erkent adviesorganen als initiërende partij in het interactieproces. Vandaar dat de verhouding tussen Duitse adviesorganen en beleidsvormende autoriteiten tot uiting komt in het technocratische model. De twee Duitse wetenschappelijke adviesraden dragen tevens bij aan beleid agendering en beoefenen pleitbezorging in de communicatie met beleidsmakers. In Polen wordt het politieke systeem gekarakteriseerd door een fiduciaire beleidsstijl. De Poolse adviesorganen brengen adviezen uit op contractbasis, zoals beschreven door het ingenieursmodel. De Poolse wetenschappelijke adviesraad is niet aan het contractmechanisme onderhevig en past de technocratische benadering toe.

De rol van de Franse, Duitse en Poolse adviesorganen bij de totstandkoming van milieugezondheidsbeleid is gebaseerd op hun operationele kenmerken en hun interpretatie van wetenschap. Twee typen adviesorganen zijn gedefinieerd;

(1) onderzoeksgerichte adviesorganen, die de rol hebben om wetenschappelijke data te produceren en (2) beleidsgerichte adviesorganen wiens rol is om wetenschappelijke kennis in haar maatschappelijke context te plaatsen. Uitzonderingen daargelaten, is geconcludeerd dat de onderzoeksgerichte adviesorganen normale wetenschap uitoefenen, terwijl beleidsgerichte adviesorganen volgens het denkbild van postnormale wetenschap handelen. In overeenstemming met hun interpretatie van wetenschap, genieten beiden typen adviesorganen verschillende functies in het beleidsvormingsproces. Daarnaast beschouwen de onderzoeksgerichte adviesorganen het concept van grenzenwerk als een constructieproces, terwijl beleidsgeoriënteerde adviesorganen de kloof tussen wetenschappelijke en niet-wetenschappelijke overwegingen overbruggen met behulp van coördinatie-mechanismen. Alhoewel grenzenwerk op een andere wijze wordt geïnterpreteerd, zijn de onderzoeksgerichte en het merendeel van de beleidsgeoriënteerde adviesorganen in staat om de wetenschappelijke status van hun adviesrapporten te garanderen.

De conclusie resulteert in twee aanbevelingen voor adviesorganen die opereren op het milieugezondheid domein.

- De werkwijze van adviesorganen zou moeten worden vastgelegd in een procedureel reglement als garantie voor hun onafhankelijke en wetenschappelijke status.
- Omtrent transnationale kwesties zouden adviesorganen een intensievere samenwerking met soortgelijke organen op Europees niveau moeten nastreven.

Abbreviations

France

AFSSE

Agence Française de Sécurité Sanitaire Environnementale
French Agency for Environmental Health Safety

CNA

Conseil National de l'Air
National Air Council

CPP

Comité de la Prévention et de la Précaution
Committee on Prevention and Precaution

CSHPPF

Conseil Supérieur d'Hygiène Publique de France
Higher Council of France on Public Hygiene

Germany

DFG

Deutsche Forschungsgemeinschaft
German Research Foundation

IMA

Inter Ministerial Committee of the German Government

MAK Kommission

Commission of DFG dealing with maximum workplace concentrations

SRU

Rat von Sachverständigen für Umweltfragen
German Advisory Council on the Environment

UBA

Umweltbundesamt
Federal Environmental Agency

WBGU

Wissenschaftlicher Beirat der Bundesregierung Globale
Umweltveränderungen
German Advisory Council on Global Change

Poland

IMP

Instytut Medycyny Pracy I Zdrowia Środowiskowego
Institute of Occupational Medicine and Environmental Health

NIOM

Instytut Medycyny Pracy IM Prof. J Nofera
NOFER Institute of Occupational Medicine

PZH

Państwowe Zakładu Higieny
National Institute of Hygiene

Science Advisory Council

Science Advisory Council for the Polish Ministry of Health

Other

EEAC

Network of European Environment and Sustainable Development
Advisory Councils

Health Council

Gezondheidsraad
Health Council of the Netherlands

NEHAP

National Environmental Health Action Plan

Introduction

It is generally acknowledged that the exposure of human health to physical environmental factors, such as air pollutants, can cause adverse health effects. In order to preserve human health from detrimental environmental factors, policy-makers create protective policy measures. Due to the transnational character of environmental health issues, policy measures in this domain are more and more developed at a European level. Accordingly, governmental authorities in the EU member states largely derive their policy measures from European legislation, which they apply to national and regional circumstances. During the development and implementation of environmental health policies, national governmental authorities request different forms of advice, including advisory reports from their institutionalized advisory bodies.

1.1 Definition of an advisory body

In this thesis an advisory body is defined as an independent statutory body, whose tasks include advising the legislature or government (departments) at national level about the current state of knowledge on environmental health matters.

The thesis only covers advisory bodies, whose operation is grounded in scientific expertise. Representative advisory structures, such as stakeholder platforms and public consultative bodies, are thus excluded. Brief definitions of the

statutory and independent status of an advisory body and its working area are as follows:

- The term ‘statutory’ means permitted, required or enacted by statute.² An advisory body should be formally established by and assigned to one or more governmental or legislative authorities.
- The term ‘independent’ refers to the status of an advisory body and its members. An advisory body should be able to operate independently from its responsible governmental authorities, without needing to have its advisory reports subjected to official checks for validity, efficiency and value.² Secondly, an advisory body should be composed of independent members, meaning that the members should act on the basis of their expertise and are not influenced by any external interests. Nevertheless, members of an advisory body may utilize the expertise of representative groups during the advisory process, as long as they act independent from any possibly conflicting interests.³
- The domain of environmental health covers external determinants on health, which are subdivided into physical, social and occupational environmental factors. An advisory body should at least be involved with providing advice about the physical environment, encompassing physical, chemical and biological agents. Nonetheless, one should consider that the domain of environmental health might comprise only one part of the total working area of an advisory body.

1.2 Aims of the thesis

An advisory body is mainly involved with policymaking by providing advisory reports to national governmental authorities. Advisory reports are formulated during a comprehensive advisory process. The advisory process, further defined as the operating procedure of an advisory body, and the mode of interaction between an advisory body and governmental authorities, affect the extent to which advisory reports are able to influence policymaking.⁴ Accordingly, the point of departure for this thesis is the assumption that the effects of advisory reports in policymaking reflect the role of an advisory body in the policymaking process.

The main aim of this thesis is to explore the role of advisory bodies in national policymaking, focusing on the effects of advisory reports in the environmental health policymaking process.

Since the environment is not confined to national borders, it is of great importance that national governmental authorities combine their activities to pro-

tect the health of the European population. Collaboration between advisory bodies from different EU member states can be helpful in achieving policy integration in the context of environmental health. Their collaboration will strengthen the scientific basis of national and European environmental health policies and will avoid similar work among the national advisory bodies.⁵

The second aim of this thesis* is to explore the value of bilateral co-operation and networking among national advisory bodies at a European level.

1.3 Motivation of the research project

The Health Council of the Netherlands (hereinafter the Health Council) commissioned to explore the role of advisory bodies in EU member states and served as the host institution while the research project was being carried out. The interest of the Health Council in the research project originates from its aspiration to intensify co-operation with other advisory bodies at the international level.

The Health Council is an independent advisory body whose task is to inform ministers and the Dutch Parliament on the 'state of science' in the field of public health.⁶ In its work program 2005, the Health Council mentions it will continue its efforts to set up an international network of scientific advisory bodies working in the public health field.⁷ The network aims to promote the exchange of scientific expertise in the field of public health in Europe among member institutions, harmonizing the working programs of the participating institutions and bringing them into line with developments at European level. The network may even produce joint advisory reports on transnational public health issues.⁵

Two scientific arguments for the research project have been derived from previous case studies and discussions in literature.

- 1 Recent comparative case studies recommend collecting more empirical data about how advisory bodies operate and their contribution to the policymaking process.

Several empirical studies recently explored the complex advisory process of institutionalized advisory bodies. In 2001 a multi-national study was published, commissioned by the Institute for Prospective Technological Studies (IPTS) of the European Commission, which described and categorized scientific advisory structures in relation to their role in the policymaking process. Subsequently, IPTS commissioned a follow-up study on the same topic, including more coun-

* The second aim serves as a significant reason for advisory bodies to participate in the research project.

tries and advisory structures.^{8,9} Furthermore, a study on the characteristics and operating procedures of the Health Council of the Netherlands and its impact on public health policies and the society was published in 2002.¹⁰

The abovementioned empirical studies indicate the need to clarify and improve the understanding of the process through which scientific advice from institutionalized advisory bodies enters into the policy arena. The empirical studies of IPTS recommend complementing the limited amount of empirical knowledge about the operation of advisory bodies, the ways advisory bodies effectively contribute to policymaking and the effects of their advisory reports.

- 2 Empirical data about the operating procedure of advisory bodies facilitates verification of the theoretical findings about the intermediating position of an advisory body on the boundary of science and policymaking.

Science and technology studies (STS) explore the complex interaction process between science and other actors in society, such as policymakers.¹¹ Advisory bodies are, for example, expected to deliver independent and scientific advisory reports that represent the state of the art in the matter concerned. At the same time, advisory bodies need input from public interest groups to produce valuable advisory reports on issues that affect society.^{8,9}

A major school of STS applies the constructivist approach to exemplify how scientists act in support of the policymaking process. The constructivists believe that scientists are able to distinguish scientific aspects from non-scientific aspects by performing boundary work.¹¹

1.4 Structure of the thesis

The thesis is structured into five chapters. Chapter 2 includes a theoretical compilation of relevant literature regarding the topic of this thesis. The theoretical framework describes the concept of policymaking and two concepts of science, clarifies the interaction process between scientific experts and policymakers and explains the operating procedure of advisory bodies. This chapter concludes with the formulation of six research questions. The methodological justification is briefly described in chapter 3. Chapter 4 includes the results of the research project, formulated per country. Each section concludes with a comparison of the results between the countries and across the individual cases. The conclusions of the thesis are discussed in Chapter 5 by means of final comparisons of advisory bodies in France, Germany and Poland and by answering the research questions. This thesis results in two recommendations addressing two points of consider-

ation for members and staff of advisory bodies and concludes with some final remarks.

Theoretical framework

The theoretical framework consists of five sections. The first section discusses the concept of policymaking, different policy styles and trends in policymaking. Two concepts of science are explained in section 2.2 and linked to policymaking by describing their policy-support functions. Proceeding with interrelating science and policymaking, section 2.3 successively discusses the interaction process between the ‘scientific world’ and the ‘policy world’. The subsequent section specifies the operating procedure of advisory bodies in the domain of environmental health by means of the concept of boundary work. The theoretical findings on science, policymaking and their mutual interaction result in a characterization framework, including four characteristics, according to which advisory bodies can be analyzed. Finally, this chapter concludes with six research questions to put the theoretical findings into practice.

2.1 The concept of policymaking

The concept of policymaking is defined as an attempt to solve, reduce or prevent a ‘problem’ by means of purposive acting.¹² Policies are developed by means of a social, information-intensive process. During the process a variety of actors are involved, who attribute their personal expertise and experience to the policy issue. Actors in the policymaking process may include politicians, civil servants, scientists, experts and representatives of pressure groups and industries.⁹ These

During the Science and Society Forum in Brussels this year, diverse spokespersons stated that the strict functional division between the term 'expert' – such as scientists and policymakers – and 'non-expert' – such as citizens –, no longer applies. Nowadays, the term 'expert' refers to 'a person who gained experience in a specific field'. The definition of an expert should thus not be restricted to a person's professional status. Citizens may also be competent to participate in discussions on scientific issues. The European Union strives for a knowledge society, knowledgeable citizens should therefore be taken seriously. Citizens can play a role in justifying scientific arguments to societal actors, as policies should ideally be based on public support. Both scientists and policymakers should therefore stimulate public dialogue and involve knowledgeable citizens with their activities. However, it is necessary to set procedural rules in order to select the appropriate citizens in expert discussions and to fairly include major and minor public opinions.

*Box 1 Science and Society Forum.*¹⁵

actors can be organized into institutions, such as business corporations or advisory bodies.¹³ In the policymaking process, all actors or institutions pursue their own interests. It is then the task and responsibility of policymakers to consult and negotiate with the various actors and institutions and to evaluate the relevance of their inputs.¹²

The policymaking process should result in rational and legitimate policies. In order to produce rational policies, scientific knowledge comprises an essential input into the policymaking process. However, the legitimizing aspect requires policies to be accepted by all actors involved with the policymaking process.¹² Interest groups or knowledgeable citizens are therefore allowed to contribute diverse viewpoints, ethical and societal information to the policymaking process, which may be in line with or deviate from the scientific rationale.¹⁴ The conference proceedings of the Science and Society Forum in Brussels this year (see Box 1) illustrate that the contribution of knowledgeable citizens can strengthen the rational basis of the policy as well.

2.1.1 *Policy styles*

The interaction between the various actors involved with the policymaking process takes place in a set of existing institutional arrangements, social relations and policy beliefs, which is defined as the policy context. The policy context may vary by country, policy domain and over time. A national political system largely affects the policy context by setting the rules of procedure for the policy-

making process and by following a particular policy style.¹³ Renn¹⁶ defined five different policy styles and explained the accompanying role of scientific experts in each of these policy styles.

- Adversarial style: A variety of actors are allowed to influence the policymaking process. Scientific experts have an important role in evaluating competing claims of evidence and help policymakers to justify the final policy decision.¹⁶
- Fiduciary style: Policymaking is restricted to a closed group of patrons. Scientific experts act as consultants and are expected to present background information about the policy issue.¹⁶
- Consensual style: Policies are formulated by means of a compromising negotiation process. The negotiating actors can request scientific experts to advocate their interests. Neutral scientific experts support the involved actors in producing compromises.¹⁶
- Corporatist style: Policymaking encompasses a formalized negotiation process. Scientific experts act as full members in the policymaking process and are allowed to raise claims from non-scientific actors.¹⁶
- Mediative style: In response to present societal demands for more open procedures in decision-making, policymakers ask for public input and stimulate public debate. The input of knowledge claims from scientific experts is fixed in rules.¹⁶

The characteristics of the first four policy styles are elaborated in Annex 1. According to Renn, the policy style of northern Europe comes closest to the corporatist approach, whilst most southern European countries exercise a fiduciary approach.¹⁶

2.1.2 *Trends in policymaking*

The first trend perceived in environmental health policymaking concerns the increasing internationalization of contemporary policy issues, which is due to the increased recognition of the transnational character of environmental health issues. This process of internationalization results in an increasing interdependence of the individual EU member states and consecutively allows for an exchange of policy experiences and for collaborative patterns of policymaking. Due to the process of internationalization, international regimes*, such as the

* Regimes are defined as 'sets of governing arrangements' or 'networks or rules, norms, and procedures that regularise behaviour and control its effects.'

European Union, and their actors affect the national policy context to a growing extent. Accordingly, national policymakers increasingly rely on scientific expertise of international expertise institutions, such as the World Health Organization, when formulating policies on transnational policy issues. Internationally-organized scientific experts are thus increasingly able to exert influence in the national policymaking process.¹³

A second trend in policymaking is related to the increasing complexity of our modern society, resulting in more complex policy issues. Beck (cited in¹⁷) defines our western society as a risk society in which risks are, to a certain extent, accepted in order to increase prosperity. The risk society regards science to be co-responsible for the production of risks, but simultaneously it requires science to define acceptable and unacceptable risks and even to provide a ‘solution framework’ to determine the acceptability of the risks. In order to fulfill their threefold role, scientific experts should integrate scientific facts with political and ethical aspects.¹⁷

2.2 Scientific concepts in function to policymaking

It is generally acknowledged that scientific knowledge must be objective, reliable, valid and reproducible. During the production of scientific knowledge these universal conditions should be taken into account. The scientific practice can either be explained according to the concept of normal science or the concept of post-normal science.*

Normal science

The concept of normal science complies with the standard paradigm of science, which interprets science as an “epistemic authority that holds the legitimate power to define, describe and explain bounded domains of reality” (cited in⁴). Normal science aims to produce scientific data. Only scientific experts are involved with the production of scientific knowledge, for which they make use of standard research methods. Scientific findings are verified with comparable empirical data and by means of extensive peer review processes.¹⁰ According to the concept of normal science, science holds an authoritarian position in society.

* The theory of Funtowicz and Ravetz explains the origin of both concepts, which is described by Prof. Dr R Hoppe in Van flipperkast naar grensverkeer – Veranderende visies op de relatie tussen wetenschap en beleid (see reference¹³).

Post-normal science

The concept of post-normal science has been derived from science and technology studies, which regards science as “a social activity to construct, justify and critically examine cognitive claims based on widely accepted methodologies and theories within the appropriate community”.¹⁶ According to this perspective, science is embedded in society. Post-normal science aims to produce ‘negotiated knowledge’ that is science-based but takes societal, ethical and political arguments of knowledgeable actors into account as well.¹⁸ Therefore post-normal science allows three kinds of experts to be involved with the production of scientific knowledge; scientific experts, practical experts and public experts.¹⁹

- 1 Scientific experts produce scientific statements about the current state of knowledge in a specific field that is related to the issue under consideration;
- 2 Practical experts, such as policy representatives from a particular governmental department, attribute personal experiences related to the issue under consideration;
- 3 Public experts represent societal actors who are probably affected by the issue under consideration. They are able to contribute indispensable knowledge on ethical and societal aspects towards the issue.¹⁹

Scientific knowledge comprises an essential input in the policymaking process. A citation of Gieryn⁴ illustrates this belief:

“Policy decisions are grounded in science as its claims are accurate, trustworthy and effective, but also because decisions can later be justified by the competence of those that are trusted with the truth.”

Policymakers lack the knowledge to cope with complex policy issues themselves and hence rely on professional experts to integrate aspects of different disciplines in order to find the best policy approach. Normal science holds three functions in supporting the policymaking process, whereas post-normal science can assist policymakers in five different ways as illustrated in the enumeration below. Only the first three functions apply to normal science.^{16,20}

- 1 Legitimizing function: Policymakers need to legitimate their policy actions and for this purpose they often adopt supportive scientific arguments.²⁰
- 2 Instrumental function: Scientific experts provide policymakers with instrumental knowledge about the likely consequences and uncertain aspects of

each policy option by submitting the results of assessments and empirically tested theories.¹⁶

- 3 Enlightenment function: Scientific experts provide policymakers with factual insights to help them identify and frame the problems in a scientific perspective.¹⁶
- 4 Interpretative function: Scientific experts provide policymakers with arguments, associations and contextual knowledge to help them reflect, improve and sharpen their judgments regarding social, cultural and institutional factors, which might have a negative or positive impact on the policy issue.¹⁶
- 5 Catalytic function: Scientific experts stimulate the process of consensus building among the actors in the policy process by providing procedural knowledge to assist policymakers in formulating policies that comply with the normative rules of rational decision-making.¹⁶

2.3 Interaction between the ‘scientific world’ and the ‘policy world’

Actors in the ‘scientific world’ and the ‘policy world’ have to consider each other’s activities. Policymakers would like to make use of scientific arguments to justify their policy decisions, while scientific experts would like to receive financial support from policymaking authorities in order to perform research and other scientific activities.²¹ Fundamental differences between the ‘scientific world’ and the ‘policy world’ lead to difficulties in the communication between both parties. Interaction models have been defined in which either scientific experts, or policymakers or both parties hold the primacy in their mutual communication process.

2.3.1 Differences between the ‘scientific world’ and the ‘policy world’

Science and policy actually belong to different worlds in which different norms and values are applicable, different languages and frames of reference are used and different goals are pursued.¹⁷ Three fundamental differences are as follows:

- 1 Scientific experts are knowledge-oriented. In order to provide policymakers with reliable knowledge, scientific experts need time to explore various aspects of the issue and to discuss related uncertainties. Policymakers are action-oriented. Policymakers must usually act under time constraints, they are therefore in need of scientific input on the short term.¹⁶
- 2 Scientific claims are extensively discussed among a broad range of specialists, resulting in a reliable reflection on the state of science. Conversely, pol-

icy drafts are generally discussed among a confined group of policy actors in order to speed up the decision-making process.¹⁶

- 3 Scientific statements are expected to represent objective claims of truth, while policy decisions have to reflect a compromise of the various interests from the different actors in the policymaking process.¹⁶

Due to the fundamental differences between the ‘scientific world’ and the ‘policy world’, scientific experts and policymakers cannot easily place themselves in each others’ position, which is illustrated by worn-out complaints originating from both parties. Policymakers complain that scientific experts lack the understanding about the process of policymaking. According to them, scientific experts speak in an incomprehensible manner and produce inaccessible products. Furthermore, policymakers hold the opinion that the production of scientific knowledge takes too long and that scientific experts are not able to clearly explain the policy impacts of their findings. Scientific experts reproach policymakers for not being interested in science. They complain that policymakers are putting too much pressure on producing results in the short term with rather constrained budgets. Moreover, scientific experts are dissatisfied about the selective use of scientific knowledge in policymaking, which is only applied to achieve predetermined policy goals.¹⁷

2.3.2 *Interaction models*

The interaction process between the ‘scientific world’ and the ‘policy world’ can take different forms, which are explained by the interaction model of Habermas (cited in²²) and Hoppe’s models on boundary arrangements.^{18,23}

The model of Habermas clarifies the position of science and policy in the interaction process according to three different approaches.

The point of departure for the technocratic approach is the belief that scientific and theoretical insights comprise a necessary understanding for practical operations, such as policymaking. Scientific experts are ‘invited’ to introduce their arguments to the policymaking process and therefore hold a dominant position in the science/policy interaction process. According to the decisionistic approach, policymakers are the initiating party in the science/policy interaction process. They request inputs from particular scientific actors, whose contribution they feel is appropriate.^{17,22} At present, the trend towards a growing complexity of policy issues results in the entanglement of the ‘scientific world’ and the ‘political world’. Scientific experts are for instance able to criticize problem statements

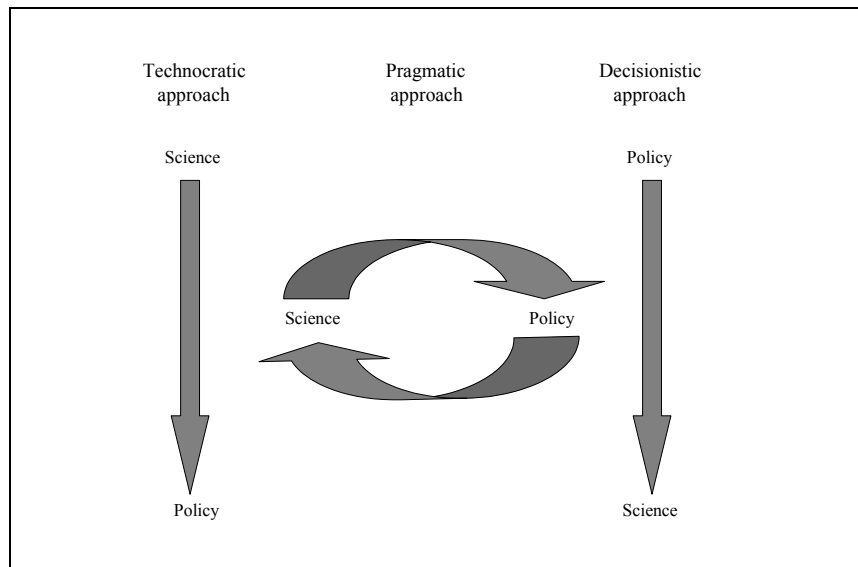


Figure 1 Model of Habermas on the interaction between science and policymaking.²²

of policymakers, to reframe policy beliefs, to suggest alternative policy strategies, to interpret policies, to provide critical reflection and to mediate in policy controversies.²⁴ The entanglement of both worlds is illustrated by the pragmatic approach.^{22,25}

Hoppe^{18,23} linked the three approaches from the model of Habermas to the operating codes defined by Wittrock. The operating code can either express a divergence or a convergence of scientific and policy activities. As a result of crossing both dimensions, Hoppe created six models on boundary arrangements between scientific experts and policymakers. Figure 2 shows the models and the respective function of science in each of these models. The characteristics of the models on boundary arrangements are described in Annex 2.

The leading role of scientific experts in science/policy interaction has been expressed by the enlightenment model and the technocracy model. According to these models, scientific experts respectively unintentionally or intentionally steer the policymaking process in a certain direction. In the bureaucracy model and the engineering model the primacy is with the policymakers. According to the engineering model, policymakers recruit scientific experts to achieve certain policy ends, while they make use of the supply of scientific data in the bureaucracy

	Technocratic approach	Pragmatic approach	Decisionistic approach
Divergent operating code	Enlightenment model ⇒ Science as suggestion supplier	Advocacy models ⇒ Science as argument supplier	Bureaucracy model ⇒ Science as data supplier
Convergent operating code	Technocracy model ⇒ Science as virtual power	Policy-oriented learning models ⇒ Science as political role model	Engineering model ⇒ Science as knowledge recruiter

Figure 2 Models on boundary arrangements between science and policy.^{18,23}

model. The dialogue between scientific experts and policymakers is either expressed by a policy-oriented learning process or by advocacy mechanisms, through which scientific experts and policymakers interact in order to achieve a certain policy end.^{18,23}

2.4 Advisory bodies and their operating procedure

Advisory bodies are institutionalized scientific expertise structures that carry out a policy-supportive role. The intermediating position of an advisory body at the boundary of science and policymaking reflects a paradoxical situation; an advisory body must produce scientific knowledge, while ethical, social and political aspects should also be considered during the formulation of an advisory report. The operating procedure of an advisory body should be developed in such a way that both requirements can be achieved. This section describes the operating procedure of advisory bodies in the context of environmental health by means of the concept of boundary work.

2.4.1 *Institutionalization of scientific expertise*

Scientific expertise has been institutionalized, because institutionalization facilitates policymakers for regulation and a continuous supply of scientific knowledge. In order to receive specific scientific knowledge related to their policy fields, governmental authorities such as ministerial departments create their own advisory bodies. These advisory bodies usually receive a financial contribution from their responsible governmental authorities. Formal and informal rules about their operating procedure, their tasks and activities are generally defined as well.²⁴ Advisory bodies can be organized in different institutional structures and can subsequently be categorized according to a variety of organizational and functional characteristics. With respect to the importance of the advisory task, research-oriented and policy-oriented advisory bodies are distinctive. In research-oriented expert institutions, the advisory task usually comprises a small part of their total scope of activities. In contrast, the advisory task is considered the main activity of policy-oriented advisory councils.⁹

2.4.2 *Operating on the boundary of science and policy*

Advisory bodies can be regarded as boundary organizations: institutions that are situated between two different social worlds – science and politics – and therefore involve actors from both sides of the boundary with their operating procedure. Guston²⁶ discusses how the blurring of boundaries between science and politics can lead to more productive policymaking. There is however no sense of how much blurring of the boundary is productive and how much might be destructive.²⁶ Jasanoff (cited in²⁷) considers negotiation and boundary work as important operating tools of advisory bodies, allowing them to guarantee the scientific character of the advisory process, whilst they are able to formulate policy-supportive advice at the same time.²⁷

Boundary work can either encompass a construction process or a co-ordination process. Boundary work is originally conceived as a construction process: “boundary work involves the attribution of selected characteristics to the institution of science (i.e. to its practitioners, methods, stock of knowledge, values and working procedures) for purposes of constructing a social boundary that distinguishes some intellectual activities as non-science” (cited from Gieryn in¹⁰). The construction process consists of successive steps at which non-scientific aspects are identified and demarcated from the scientific arguments.¹¹ Boundary work can also be interpreted as a co-ordination process. Advisory bodies act as mediat-

ing institutions that purposely participate in the policymaking process and are therefore involved with the scientific, political and ethical aspects related to the topic of advice.²⁸

The operating procedure of advisory bodies distinguishes between ‘public’ front stage and ‘scientific’ backstage activities. Stakeholder and public consultations during the advisory process are usually performed in the front stage while the integration and conversion of scientific arguments and non-scientific considerations into an advisory report occur in the backstage. The co-ordination process implies that relevant considerations from the ‘outside world’, i.e. the front stage, are taken into account and subsequently connected with scientific considerations – produced from backstage activities. The resulting heterogeneous mixture of considerations is compiled in an unambiguous advisory report. Policymakers regard these advisory reports as science-based documents, describing the state-of-the-art on the topic of advice.¹⁰

Operating in the context of environmental health

Advisory bodies support policymakers in dealing with complex environmental health issues by estimating and evaluating health risks from exposure to environmental pollution. The risk assessment process illustrates the practice of boundary work at advisory bodies in the domain of environmental health. The risk assessment paradigm, drawn by the National Research Council of the US National Academy of Sciences, provides a conceptual understanding of the risk assessment process.²⁹

The risk assessment paradigm clarifies the concepts of risk assessment and risk management and demonstrates their interrelation. Risk assessment includes the identification of hazardous chemical, biological and physical agents and subsequently applies two assessment techniques to measure the likelihood of environmental agents causing adverse health effects. During risk assessment only scientific methods are applied, which is in line with the scientific practice of normal science. The results of risk assessment, supplemented by political, social and engineering information allow for risk management decisions on measures to be taken to protect public health from potential environmental risks. According to the interpretation of boundary work as a co-ordination process and the concept of post-normal science, advisory bodies should consider societal aspects in addition to the scientific data, encompassing both risk assessment and risk management. Risk characterization represents the interface between assessment and manage-

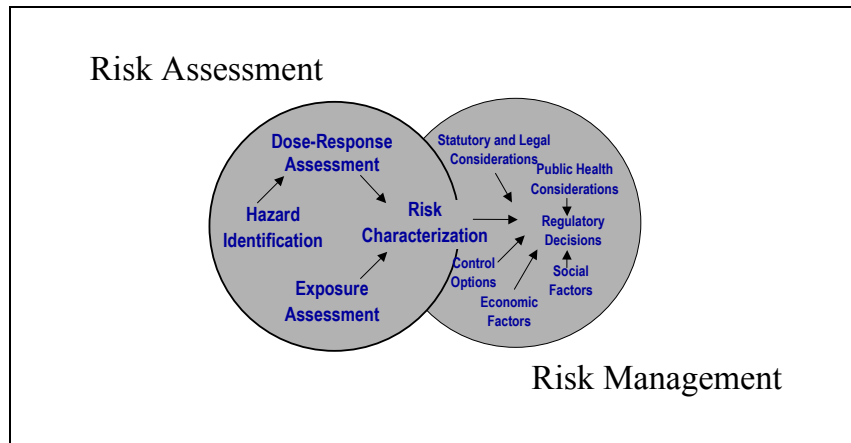


Figure 3 Risk Assessment Paradigm of the National Research Council (1983).²⁹

ment. Scientific findings and the identified uncertainties are translated into comprehensive and understandable terms in order to assist risk managers in decision-making. During this step, the boundary between the scientific world and the policy world is established.²⁹

2.5 Putting the theoretical findings into practice

The theoretical findings are organized into four characteristics in order to characterize the operating context and the operating procedure of advisory bodies: (1) interpretation of science, including (1a) the position of science and (1b) the concept of science, (2) functions of science in policymaking, (3) the interaction models of (3a) Habermas and (3b) Hoppe and (4) the operating procedure of advisory bodies according to (4a) the interpretation of boundary work and (4b) their scientific practice. Table 1 illustrates the four characteristics and components, their characterization possibilities and includes the referrals to the relevant section of the theoretical framework. To a certain extent, the interrelation between the characteristics has already been discussed in the previous sections. It is however important to examine the four characteristics separately in order to facilitate a mutual comparison between the advisory bodies in France, Germany and Poland and verification with the theoretical findings.

Table 1 Characterization framework.

Characteristic	Components	Characterization possibilities	Section reference
Interpretation of science	Position of science	<ul style="list-style-type: none"> • Science as authoritative actor • Science as social embedded actor 	2.2
	Concept of science	<ul style="list-style-type: none"> • Normal science • Post-normal science 	2.2
Function of science in policymaking		<ul style="list-style-type: none"> • Legitimizing function • Enlightenment function • Instrumental function • Interpretative function • Catalytic function 	2.2
Science/policy interaction models	Interaction process between science and policy	<ul style="list-style-type: none"> • Technocratic approach • Decisionistic approach • Pragmatic approach 	2.3.2
	Models on boundary arrangements	<ul style="list-style-type: none"> • Enlightenment model • Advocacy models • Bureaucracy model • Technocracy model • Policy-oriented learning models • Engineering model 	2.3.2
Operating procedure of advisory bodies	Interpretation of boundary work	<ul style="list-style-type: none"> • Boundary work as construction process • Boundary work as co-ordination process 	2.4.2
	Scientific practice	<ul style="list-style-type: none"> • Production of scientific data • Production of scientific knowledge in a societal context 	2.4.2

Research questions

- The thesis explores the role of French, German and Polish advisory bodies in policymaking, based on the assumption that the operating procedure of advisory bodies is influenced by the organization of the advisory system and the political culture.
- The thesis explores the operating procedure of advisory bodies, based on the assumption that advisory bodies produce science-based advisory reports about complex environmental health issues, involving scientific and non-scientific activities.

The theoretical findings result in assumptions about advisory bodies regarding their operating context and their operating procedure. In order to put the theoretical findings into practice, six research questions have been formulated to explore the selected advisory bodies in France, Germany and Poland:

Research question 1: How is the advisory system organized in the political systems of France, Germany and Poland?

Research question 2: To what extent can literature on the interrelation between science and policy, as reflected in the characterization framework, be applied for characterizing advisory bodies in France, Germany and Poland?

Research question 3: How do the advisory bodies in France, Germany and Poland guarantee the scientific status of their advisory reports?

Research question 4: In what way and to what extent are scientific and non-scientific considerations integrated during the advisory process of the advisory bodies in France, Germany and Poland?

Research question 5: What effects do the advisory reports from the advisory bodies in France, Germany and Poland have in the national environmental health policymaking process?

Research question 6: What opinions do the advisory bodies in France, Germany and Poland have about bilateral co-operation and networking?

Methodological justification

This chapter describes the methodological part of the research project. The first section (see 3.1) outlines the research strategy. The role of advisory bodies in the environmental health policymaking process has been explored by means of in-depth case studies. Twelve selected advisory bodies participated in the research project. The selection procedure is described in section 3.2. Moving from broad to more specific data collection, the following research methods have been used: an inventory of existent advisory bodies in European countries, web research, questionnaires, document analysis and personal interviews. Comparative in-depth analysis has subsequently been applied to generate the results of the data collection. The data collection and the comparative analysis are described in section 3.3.

3.1 Research strategy

The research project required a qualitative research strategy, because of its explorative and descriptive character. The empirical data have been collected by means of twelve in-depth case studies in France, Germany and Poland, at which four advisory bodies have been studied in each country. The empirical data consist of documents about and reports from the participating advisory bodies and of statements from appropriate spokespersons. Five topics of interest served as guidelines in the data collection. These areas include (1) the advisory system and

the diversity of advisory bodies, (2) the relationship between advisory bodies and policymaking authorities, (3) the operating procedure of advisory bodies, (4) the effects of advisory reports in policymaking and (5) the level of co-operation of advisory bodies at the national and at the European level. These five topics are reflected in the five sections of Chapter 4, in which the results from the case studies are described and linked to one or more of the six research questions.

3.2 Selection procedure

The number of cases had to be restricted in order to allow for the retrieval of appropriate results within the length of the research project. In order to select the appropriate advisory bodies, the selection procedure involved three subsequent phases. Three EU member states were selected in the first phase. In the second phase of selection, the relevant advisory bodies within the respective countries were chosen. The third phase included the selection of the appropriate spokespersons at the advisory bodies. The subsequent selections have been based on results from comparative studies and preliminary data collection (see section 3.3), the definition of an advisory body in the domain of environmental health (see section 1.1) and on practical considerations.

Selection of three EU member states

France, Germany and Poland were selected according to three criteria:

- 1 The advisory systems in the potential countries for selection should be differently organized in order to allow for comparative analysis.
 - This criterion has been applied to the EU member states by means of the results from two earlier comparative empirical studies, commissioned by IPTS (see section 1.3) and through web research.
- 2 A number of advisory bodies in the domain of environmental health, should be operational within the potential countries for selection.
- 3 It should be possible to effectively conduct personal interviews with respect to the constrained time period and the constrained budget of the research project.

Selection of twelve advisory bodies

After the selection of France, Germany and Poland, four advisory bodies within each country were selected according to six criteria.

- 1 A potential advisory body for selection should have an important status within its country, implying that its advisory reports should produce effects in the environmental health policymaking process.
 - Publication records served as an indicator for this criterion.
- 2 A potential advisory body for selection should have the formal task to produce advisory reports for governmental or legislative authorities.
- 3 A potential advisory body for selection should produce advisory reports in the domain of environmental health.
- 4 A potential advisory body for selection should be composed of independent members who have expertise in the domain of environmental health.
- 5 A potential advisory body for selection should be approachable, meaning that appropriate spokespersons of the advisory body are willing to co-operate.
- 6 Communication in English with appropriate spokespersons of a potential advisory body for selection should be possible.

The selected advisory bodies are as follows:

France

- French Agency for Environmental Health Safety (AFSSE)*
- National Air Council (CNA)
- Committee on Prevention and Precaution (CPP)
- Higher Council of France on Public Hygiene (CSHPF)

Germany

- German Research Foundation (DFG) - Sub working group on 'Analyses of Hazardous Substances in Air'
- German Advisory Council on the Environment (SRU)
- Federal Environmental Agency (UBA) - Division Environment and Health: Water, Soil and Air Hygiene
- German Advisory Council on Global Change (WBGU)

Poland

- Institute of Occupational Medicine and Environmental Health (IMP)
- NOFER Institute of Occupational Medicine (NIOM)
- National Institute of Hygiene (PZH)

* At 5 September 2005, AFSSE has been renamed AFSSET: Agence Française de Sécurité Sanitaire Environnementale et du Travail.

- Science Advisory Council for the Polish Ministry of Health (Science Advisory Council)

Selection of appropriate spokespersons

The last part of the selection procedure included approaching appropriate spokespersons from the selected advisory bodies. Executive officers (such as the Director, President or Executive Director) and expert members in the environmental health domain have been selected as the appropriate spokespersons.

- An executive officer is able to communicate aspects of the overall functioning of its advisory body, therefore this spokesperson was regarded as the appropriate source for completing a questionnaire with general questions about the organization and operating procedure of the advisory body. The executive officer was also asked for contact information about one of its expert members, whose task is to produce advisory reports in the domain of environmental health.
- An expert member has practical knowledge about the advisory process, so in addition to completing a similar questionnaire, this spokesperson was asked to co-operate in an interview.

The contacts of the participating advisory bodies are stated in Annex 3.

3.3 Data collection

The main qualitative research methods used in the data collection include the questionnaire and the in-depth interview. This section discusses the preliminary data collection, the outline and contents of the questionnaire and the in-depth interview. It concludes with an explanation of the methods of analysis.

3.3.1 Preliminary data collection

At the outset of the research project it was first necessary to obtain an overall overview of advisory bodies operating in the environmental health domain within the EU member states. Since the Health Council of the Netherlands already carried out an inventory among members of the 'Network of Competent Authorities' on scientific advisory structures operating in the field of public health, the findings of this inventory have been used as a starting point for further exploration. The findings of the inventory were supplemented by means of web research and personal contact with potential advisory bodies for selection. The

collected data from the inventory, the web research and personal contact comprised the point of departure for the selection of the appropriate advisory bodies. Advisory reports and other relevant documents from the selected advisory bodies provided more specific information about the operation of the selected advisory bodies and their working area. The contents and the outline of the questionnaire and the in-depth interview have been based on the findings of the preliminary data collection.

3.3.2 *Qualitative data collection*

The aim of the questionnaire is to explore the overall functioning of the selected advisory bodies. The questionnaire is ordered into five topics: 'general information', 'structure', 'advisory task', 'relation science/policy' and 'co-operation with institutions active in the same field'. The questionnaire mainly consists of multiple-choice questions (see Annex 4). The selected spokespersons of the advisory bodies completed the questionnaire. The interview is aimed at exploring in-depth the role of the selected advisory bodies in the environmental health policy-making process by means of inquiring about the composition of advisory reports and the contents of the advisory process. The interviews were conducted on location with expert members of the advisory bodies. The questions are ordered into four topics: 'position of the institution within the advisory system of the respective country', 'the advisory role of the institution', 'relationship of the institution with the government or legislature', and 'co-operation with institutions active in the same field'. Most questions are open and several statements are included. The questions were introduced by a statement from the science/policy literature or by the outcomes of the questionnaires from the respective advisory body (see Annex 5 and Annex 6). A selected advisory report and additional examples on discussed environmental health matters were used to concretize the interview questions, especially those relating to the first two topics.

Two scientific staff members and a former executive director of the Health Council of the Netherlands participated in the pilot stage of the qualitative data collection.

3.3.3 *Methods of analysis*

During the data analysis the findings of the preliminary and qualitative data collection were combined. The data triangulation resulted in findings and conclusions that are much more convincing and accurate than is the case with separate data analyses. Each case should be understood in its own context, yet the aim of

this thesis is to explore the role of advisory bodies across the cases and between the three countries. Comparative in-depth analysis allowed this aim to be achieved. The results of the data collection at each advisory body have been structured in order to answer the research questions and have subsequently been put in the light of the theoretical findings. The remaining results from the data analysis of the twelve individual cases, which are nonetheless important, are briefly described in Annex 7.

Results

In this chapter the results of analysis from twelve advisory bodies in France, Germany and Poland are presented. The results are subdivided in five sections, including only the findings that are necessary for answering one or more research questions. Each section discusses the results from the case studies in France, Germany and Poland. Each section is concluded by a comparison, in which the findings are linked to theoretical notions regarding the subject of the section. A detailed description of the objectives, task description, internal structure and operating procedure per advisory body is formulated in Annex 7.

4.1 The advisory system in the policy context

The advisory systems in France, Germany and Poland are differently organized, due to the variations in the political system within the respective countries. This section describes the findings on the political system, the advisory system and the relationship between advisory bodies and policymaking authorities in France, Germany and Poland. A brief conclusion (see 4.1.4), relates the findings of this section to the theoretical notions on the policy style (see section 2.1.1) and the modes of interaction between scientific experts and policymakers (see section 2.3.2). The answer to the first research questions regarding the organization of the advisory system can be derived from this section. Furthermore, the findings

of this section also contribute to the characterization of advisory bodies, which is covered by the second research question.

4.1.1 *France*

The policy style of French governmental authorities is characterized by its highly centralized political structure. Policymaking is a result of collaboration between the President of the French Republic, the government with its ministries and the parliament, comprising the National Assembly and the Senate.⁸ The present government committed itself to pursue transparent policymaking, which is reflected in the organization of the French advisory system.³⁰

The Ministry of Ecology and Sustainable Development (hereinafter referred to as the Ministry of Environment) is in charge of environmental affairs. Environmental health policies are designed and implemented in co-operation with other ministries, mainly with the Ministry of Health, Family and the Disabled (hereinafter referred to as the Ministry of Health). Since 1995, the precautionary principle is formally acknowledged as the basic principle for the formulation of environmental health policies. At that time, the importance of developing policy measures in this domain was also reflected in the increase of highly-specialized advisory bodies on environmental health issues.⁸

Advisory system

French advisory bodies are official public structures, which have grown more numerous and specialized over the years. Advisory bodies are created and regulated by law.⁸ In part, this regulated advisory system results from the French public health drama in the 80's. At that time, blood transfusions led to AIDS contamination and the subsequent death of hundreds of people. This drama was attributed to a poor functioning of the scientific expertise function in those days and a lack of communication between scientific experts and policymakers. Consequently, the relationship between scientific experts and policymakers needed to be improved.

A law on 'the reinforcement of public health surveillance and the control of the safety of products concerning humans' was issued on July 1, 1998. This law was aimed to provide the French population with more clarity on health security matters. Furthermore, it provided the basis for the revision of the French advisory system; the law initiated a reconsideration of the tasks of the existing agencies and institutions in the domain of public health. An important aspect of the law is that it defines the demarcation between risk assessment and risk manage-

ment. The former should be performed by scientific experts, while policymakers are responsible for the latter. Expertise has thus been explicitly externalized from ministries into dedicated specialized agencies.³⁰ In addition, the old and prestigious institutions with a large work scope are kept in place, though with a more or less adapted mission and structure. As a result, France nowadays constitutes a complex advisory system, including bodies from several generations.⁸

After the law of 1998, new expert agencies were created: a national committee of health security, a national institute for public health surveillance and three agencies in charge of expert advice. One of the latter is included in this research project: the French Agency for Safety of the Environment (AFSSE). The AFSSE is placed under the Ministry of Health and the Ministry of Environment. In the second instance, the Higher Council of France on Public Hygiene (CSHPF), an established advisory council under the Ministry of Health, is studied. Furthermore, two small-scale specialized committees under the Ministry of Environment – the Committee on Precaution and Prevention (CPP) and the National Air Council (CNA) – participate in this research project.

The French advisory system is continually evolving, due to related political developments. The present tendency in its organization is towards a socially embedded advisory system, which implies that scientific experts have to disclose their interests connected to the advisory topics and have to discuss their opinions in a public way. In reality, the ‘socially embedded advisory system’ is only expressed at the AFSSE. The major part of the French advisory system still applies a formalized and confidential procedure.³⁰

Relationship between advisers and policymakers

Scientific independence of French advisory bodies has officially been acknowledged as a result of parliament discussion about the law of 1998.³¹ Because the advisory bodies are created by and act in service of French governmental authorities, they receive financial and administrative support from their related ministries.⁸ The administrations of the CSHPF and the CNA are situated in the responsible ministries and are highly involved with the advisory process of the CSHPF and the CNA.^{32,33}

The members of French advisory bodies are officially appointed by the relevant ministry or ministries, though most advisory bodies still have a major role in the selection process themselves.⁸ Representatives from various ministries are assigned as formal members of the CNA.³³ Furthermore, legislators often participate in the meetings of the CPP and the CSHPF and are allowed to contribute to

discussions. According to Hubert (CPP), involvement of policymakers is even essential for the continuation of the CPP, since their participation increases the policy attention for CPP's advices. The interviewees of the CSHPF also remark that the participating legislators are not allowed to interfere with the scientific parts of the advisory process.^{32,34}

The relationship between advisers and policymakers has a formalized nature. The lines of accountability between both parties are clearly defined. When French governmental authorities are in need of advice, they request an advisory report from one of their institutionalized advisory bodies.³³ In particular domains, for instance food products, they are obliged to direct their requests to particular advisory bodies.³²

Several times per year, the AFSSE and the CPP have formal contact with their responsible ministries. With respect to the AFSSE, these periodic meetings are about the agency's progress and upcoming requests for advice.³¹ In addition, the Director of AFSSE and the President of the CPP have frequent and informal contact with Directors of specific ministerial units.^{31,34} Via their administrations, the CNA and the CSHPF also have regular contact with policymakers.^{32,33}

Final advisory reports are presented to policymakers at the relevant ministries. Rocard (CNA) remarks that CNA's administration internally distributes final reports to the Unit of Air Quality within the Ministry of Environment.³³ In addition, Hubert (CPP) points out that advisory reports are primarily utilized by the ministerial administrations.³⁴

4.1.2 *Germany*

Germany is a federal state with a three-tier system of government: the Federation (national government), the 16 Länder (federal states) and the municipalities (local authorities). In practice, the Federation has the leading role in policymaking and legislation regarding environmental health issues, whilst the Länder have the main responsibility for the enforcement of these policies and legislatives. Despite the fact that the governmental system is formally organized in separate entities, there is a network of co-operation and co-ordination between the authorities of the Federation, the Länder and the municipalities. Moreover, interministerial bodies and ad hoc working groups co-ordinate cross-sectional issues.³⁵ Accordingly, the nature of German policymaking is demonstrated by coalition building, structures of interest mediation, interlocking federalism, issue-oriented problem solving, consensus orientation and joint decision-making.

The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (hereinafter the Ministry for the Environment) deals with environmental matters from 1986 onwards. A department of the Ministry deals with the health-related aspects of environmental protection issues.³⁶

Advisory system

Due to the consensual and negotiation-oriented character of German policymaking and the increasing complexity and interdependency of issue areas, policymakers rely heavily on the input of scientific and technical advice. Since 1998, the German policymaking authorities have explicitly made use of external expertise in order to avoid political entanglement. The key features of the German advisory system are a fragmented network construction and a complex and opaque structure.³⁶ Furthermore, the advisory system encompasses no formal construction; ad hoc and permanent advisory structures co-exist. The federal ministries mainly utilize the scientific expertise from related institutionalized expert agencies and advisory councils. In addition, they are free to request advice from numerous independent expert bodies and ad hoc expert groups. Recently, several thematic high-level advisory bodies have been created that span ministries and direct their advice to the federal government.⁸

The advisory system in the context of environmental health is considered to be the most transparent of all policy areas. The Ministry for the Environment is supported by three departmental expert agencies and also receives advice, outlined in statements and expert opinions, from several independent expert bodies and advisory councils.³⁵ In this thesis, an independent scientific council of the Ministry for the Environment – the German Advisory Council on the Environment (SRU) – and a high-level scientific advisory council – the German Advisory Council on Global Change (WBGU) – are studied. Both councils are major policy advisers to the Ministry for the Environment. The councils make use of research findings from German (departmental) expert agencies and research institutions. The Federal Environmental Agency (UBA), a departmental expert agency of the Ministry for the Environment, is also included in the research project. The UBA generates scientific background information that is aimed to support the policymakers at the Ministry for the Environment. Furthermore, the German Research Foundation (DFG), more specifically its sub-working group on ‘Analyses of hazardous substances in air’, is studied. The DFG is an independent self-governing body, acting in the interest of the German sciences and

research institutions. Its service can be requested by governmental and public authorities.

There are two important developments in the organization of the German advisory system. First, there is a tendency to have high-level, cross-departmental bodies advising the federal government rather than a single ministry. In the second place targeted, specific advice is increasingly important and progressively utilized to support policymaking and stimulate policy change.⁸

Relationship between advisers and policymakers

The German advisory bodies operate independently from any governmental authority. However, the UBA and the DFG receive an annual budget, respectively from the Ministry for the Environment and the Federal Ministry for Research and Economics. The ministries also decide on the appointment of their top-level staff. Conversely, the scientific advisory councils receive only a small annual budget.³⁷⁻⁴⁰

The council members of the SRU and the WBGU are selected by the Ministry for the Environment. Moreover, an interministerial committee (IMA) has a final vote in nominating the council members of the WBGU, while SRU's members are appointed by the federal government. Policymakers often act as advisors or consultants during the advisory process of the German advisory bodies.^{39,40}

The relationship between advisers and policymakers is based on formal and informal contact. Formal communication at least takes place during the initial and final phase of the advisory process, when advisory requests are discussed and final advisory reports are presented. Furthermore, the Ministry for the Environment is allowed to comment on final draft reports of the UBA.³⁷ The WBGU officially presents its reports to the IMA. The IMA is obliged to discuss the advisory reports of the WBGU and has the opportunity to make critical, though not binding comments.⁴⁰

With regard to the SRU and the WBGU, informal and ongoing communication takes place between civil servants of federal ministries with expertise in the field of the advisory topic and council or scientific staff members of the WBGU and the SRU.^{39,40} Representatives of the Ministry for the Environment meet approximately every second week with the Presidents of their agencies, including the UBA. At lower level, the units of the UBA could contact their counterparts within the Ministry.³⁷ With respect to the DFG, only the Presidents of DFG's commissions have regular contact with particular persons within the Ministry of Economics and Labor.³⁸

4.1.3 Poland

The Polish state comprises a central government, 16 voivodeships (regions) and the gmina (municipalities). The Republic of Poland has held a sovereign and democratic polity since 1989.⁴¹ The Polish state is governed by the legislative authority, existing of the Sejm (parliament) and the Senate, the executive power and the judicial authority.⁴² The Polish Ministry of Environment administers environmental policies, while public health matters are discussed at the Ministry of Health. Both ministries are obliged to co-operate on environmental health policies, which for instance took place during the production of the Polish NEHAP. However, there is still a lack of proper communication between both parties, since both ministries operate on different data regarding the same environmental health topic.⁴³

In their daily business, both Polish ministries are supported by their research and development units and are advised by several councils (rada) and their own Inspection. The Chief Sanitary Inspection for the Ministry of Health includes a department of Environmental Hygiene, the tasks of which include analyzing and assessing the impact of environmental factors on human health. Its departments consult and exchange information with the research and development units of the Ministry.⁴⁴

Advisory system

The Polish advisory system has an ad hoc character and is organized on three levels; the governmental, regional and local level.⁴⁵ Policymakers are in need of scientific advice, though paradoxically the present political system does not do a great deal to support and stimulate progress in the scientific field. Majewski (Science Advisory Council) remarks that scientific progress will most likely result in an improved organization of the Polish advisory system as well.⁴⁶

At a ministerial level, the advisory system consists of scientific councils and expert institutions. The latter mainly perform their advisory task on a contract basis.⁴⁵ The expert institutions therefore have a competitive attitude towards each other. The expert institutions operating on environmental health issues are related to the Ministry of Health. However, the Ministry of Environment is mostly interested in environmental health matters, according to the interviewees of the Institute for Occupational Medicine and Environmental Health (IMP).⁴⁷ Besides the IMP, two other expert institutions are studied: the Nofer Institute of Occupational Medicine (NIOM) and the National Institute of Hygiene (PZH). In

the near future, the latter may be turned into a National Institute of Public Health, which is expected to obtain a major advisory role. The Science Advisory Council for the Ministry of Health (further abbreviated to Science Advisory Council) is the fourth object of study.

Since the development of the Polish NEHAP, environmental health issues have received more policy attention. At present, a tendency towards an increase in public awareness and an interest in environmental health is also apparent.⁴⁷

Relationship between advisers and policymakers

The Polish expert institutions (NIH, NIOM, PZH) do not operate independently from the Ministry of Health. In fact, the Ministry decides on the long-term strategy of the expert institutions and must approve of their work programs. The expert institutions are obliged to produce scientific advice when requested by the Ministry of Health.⁴⁵ The Polish expert institutions receive a fixed budget for their statutory activities only, which mainly covers the basic research programs. Advisory activities are not covered by this budget. When a request for advice is submitted, the sum of money is based on the required expertise and the time period needed for its realization. Due to this contracting system the institutions can often not apply all necessary methodological techniques.⁴⁷ In contrast to the expert institutions, the Science Advisory Council is entirely involved with advising. The council officially holds an independent status, but it is not formally constituted; its maintenance is based on the devotion of the members, who are nominated by the Ministry of Health. In contrast to the expert institutions, the council does not perform its advisory task on a contract basis, but it receives no fixed budget either.⁴⁶

The relationship between the Polish advisory bodies and the policymakers at the Ministry of Health has an informal nature. The IMP and the NIOM have frequent and continuous contact with various persons within the Ministry of Health. Most of the time, the IMP contacts policymakers within the Public Health Department of the Ministry. The NIOM also has frequent contact with policymakers at both the Department of Science and the Department of Education. Both institutions also have direct contact with the Chief Sanitary Inspection and its regional and local agencies.^{45,47} The interviewees of the PZH point out that they mainly keep indirect contact with the Ministry of Health via experts at the Sanitary Inspection.⁴³ In addition to these individual contacts, the expert institutions may be collectively consulted by governmental authorities, for instance during the preparation of laws.⁴⁷ Via its administration, the Science Advisory

Council holds frequent contact with the Ministry of Health. Furthermore, the Directors of the Science and Public Health departments of the Ministry are invited during the advisory process and have the opportunity to review the reports.⁴⁶

4.1.4 *In conclusion*

The three countries have quite different political systems, resulting in a different organization of their advisory system. In order to compare the advisory systems of the three countries, this section links the findings of section 4.1 to the various policy styles, defined by Renn.¹⁶ The relationship between advisory bodies and policymaking authorities is characterized, as are the distinctions between the three countries according to the models on boundary arrangements of Hoppe.^{18,23}

Policy style of France, Germany and Poland

The policymaking authorities in Poland comprise a closed circle of patrons, who request input of scientific expertise when needed. The advisory system in Poland is characterized by its ad hoc and contracting nature. Accordingly, the Polish policy style best complies with the fiduciary style. In contrast, German and French policymaking authorities are open to inputs from ‘outside’. The openness of the German policy system allows scientific experts to bring in knowledge on specific issues themselves. Hence, the German policy style relates to the corporatist style. French policymakers, at least in theory, strive for a transparent political system wherein a variety of societal actors are allowed to be involved. They aim at achieving a mediative policy style. In practice, the French advisory system is strictly regulated and mainly operates in a formalized and confidential manner, which complies with an adversarial* policy style.

Boundary arrangements between advisory bodies and policymaking authorities

Since German policymakers strongly rely on scientific and technical expertise throughout the whole policymaking process, German advisory bodies hold an influential position in the German political system. The relationship between German advisory bodies and German policymakers complies with the technocracy model. The German scientific advisory councils – the SRU and the WBGU

* The adversarial policy style defined by Renn¹² points to a bureaucratic consultative policy approach.

– also facilitate the development of environmental health policies by providing scientific arguments on emerging environmental health matters, in accordance with the advocacy models.

French policymakers, on the other hand, strictly organize the input of scientific information into the policymaking process themselves. French advisory bodies are in particular requested to produce constructive scientific knowledge about a topic of advice. The advisory committees – the CNA and the CPP – submit science-based points of view on the development of legislations or policy measures, which are produced in dialogue with a variety of experts, including policymakers and legislators. In accordance with these observations, the bureaucracy model applies to the French advisory system in general, while the relationship of the CNA and the CPP with the Ministry of Environment also points to the policy-oriented learning models.

The Polish expert institutions – the NIH, the NIOM and the PZH – provide the Polish Ministry of Health with specific research findings and scientific knowledge when requested. The engineering model best fits the Polish advisory system regarding the mode of interaction between the Polish expertise institutions and the Ministry of Health. The relationship of the Science Advisory Council with its policymaking authorities is in accordance with the enlightenment model. The council autonomously formulates scientific knowledge, which is only utilized by policymakers when it suits them.

4.2 Organization and composition of advisory bodies

In the subsequent sections the major characteristics of the internal organization of the four advisory bodies in France, Germany and Poland are described, specifically with regard to the contents of their advisory task and the composition of their members. These findings contribute to the second research question and provide information for answering the third question about the scientific status of advisory reports. The members of advisory bodies actually produce the advisory reports and thus influence the reports' status. In addition, Annex 7 provides background information about the internal organization of the advisory bodies.

4.2.1 France

The French advisory system makes an organizational distinction between historically and recently created advisory bodies and between large expertise agencies and specialized advisory committees. The AFSSE is an expertise agency that provides the Ministry of Environment and the Ministry of Health with scientific

and technical expertise, on which the ministries can then base their policy decisions and regulations. The AFSSE collects and subsequently integrates the required expertise for answering the advisory request from its internal experts and participating external experts and from other French public and technical institutions in the environmental health domain.³¹ The CNA works exclusively on air pollution issues and was created as a result of the Law on Air of 1996.³³ The CPP deals with matters that call for preventive or precautionary policy measures.³⁴ The CSHPF is the oldest French public health advisory body (established in 1822). It holds a broad range of responsibilities, although the law of 1998 partially resulted in the relocation of its assessment activities to other agencies, such as the AFSSE. In the near future, the CSHPF will therefore be more involved with advising on regulation and management of public health issues.³²

All actors involved in AFSSE's advisory process are scientific experts, categorized into internal employees, external experts and consultants from sister agencies. The composition of its expert committees results from a transparent, internal application procedure. The majority of the applicants selected are nominated by the Health and Environment Ministers. AFSSE's members are not allowed to have structural and long-term links to industrial corporations, and should therefore annually update a conflicts of interest form that is verified at the beginning of each meeting as well.³¹ This procedure is the same for the members of CSHPF's sections and working groups. Its members are qualified experts who voluntarily participate in CSHPF.³²

The CPP consists of permanent specialists and experts with broad areas of interest, who hold a chief occupation at technical institutions or industrial corporations in France. The CPP's members have various backgrounds, including jurists and economists. They are not obliged to declare any interests, though the members have the informal responsibility of excluding themselves from an advisory matter in the case of conflicting interests.³⁴ The CNA also includes non-scientific experts, such as public representatives and stakeholders from governmental authorities, public agencies and from French associations or industries. In its decree is predetermined to cover all relevant expertise and interests regarding air pollution issues. During CNA's advisory process, its members represent their personal interests.³³

4.2.2 *Germany*

The German advisory system is organized in a twin-structure: there is a clear organizational distinction between large-scale expert institutions or agencies and small-scale advisory councils.⁸ The two scientific advisory councils – the SRU

and the WBGU – focus on the environmental domain and are specialized in specific fields. The SRU operates on environmental politics and the WBGU focuses on global change issues.^{39,40} The overall scope of the UBA encompasses environmental protection issues. Since 1994, environmental health issues have also been included.³⁷ The senate of the DFG is responsible for questions related to science and research policies. Its commissions, committees and working groups deal with various research areas, such as chemical compounds in the work area.⁴⁸

All council members of the SRU hold a Professors' title and are nominated according to the need for their expertise during the next term. The members of the WBGU are respectable scientists and experts in the field of global change. Besides natural scientists, the WBGU nowadays also constitutes social and economic scientists. Due to its small number of members, the WBGU currently lacks expertise in the domain of environmental health. Environmental health issues are therefore not discussed during its present term from 2004 until 2009. The council members of the SRU and the WBGU operate as independent actors, who are not asked about possibly conflicting interests.^{39,40} This is the same for the members of DFG and the scientific staff members of the UBA.

The members of the DFG and the scientific staff members of the UBA are selected according to their level of scientific expertise and their level of experience.^{37,38} With regard to the composition of DFG's sub working group on air analysis, past and present activities of applicants in the context of air analytics are also considered. The sub working group currently comprises 28 members mostly including guest experts and only four fixed members. Approximately one quarter of its expert members represent a German industrial corporation. Other members have their main occupation at a scientific institution, a governmental authority or a German university. According to Parlar (DFG), the members do not pursue the interests of their home institutions, which he illustrates by their desire to reach a consensus and their voluntary contribution to the DFG. However, heads of commissions and working groups of the DFG may not in any way be linked to an industrial corporation or expert agency. They usually hold a Professors' title.³⁸

4.2.3 *Poland*

The expert institutions (IMP, NIOM and PZH) cover a broad range of topics, which are arranged in their departmental units. In fact the IMP is the only institution in Poland that exclusively deals with environmental health matters.⁴⁷ The expert institutions have a quite extensive structure. The PZH has 13 branches throughout Poland that are managed by the Head Office in Warszawa. Besides its

scientific sections, laboratories, research services and administrative sections are also included. In addition to their scientific sections, the NIOM also encompasses a school of public health and a research council and the IMP includes a clinical department and a hospital for occupationally and environmentally-exposed patients.^{43,45,47} In contrast, the Science Advisory Council and its committees are specifically engaged in producing advice on developments in medical sciences. Its scope of activities includes medical-related environmental health issues as well.⁴⁶

The Science Advisory Council consists of specialists, who hold a chief position at Polish institutions or universities in the medical field. When the permanent members lack the required expertise, external experts are invited to temporarily participate in the council. When dealing with an advisory topic the members are allowed to lobby for certain interests.⁴⁶

The advisory process at the IMP, the NIOM and the PZH is mainly performed by internal, permanent staff members. Conflicting interests are therefore not generally an issue. Because advisory projects create extra workload, the appropriate internal experts obtain a temporary appointment to deal with the request. All staff members are independent experts, who are selected according to their reputation and level of expertise. The IMP covers a broad range of expertise, and external experts are therefore not usually involved. In contrast, the NIOM and the PZH temporarily appoint external experts when they are in need of particular expertise.^{43,45,47}

4.2.4 *In conclusion*

This conclusion draws a comparison between advisory bodies in France, Germany and Poland in terms of the nature of the advisory task and the composition of members.

Contents of the advisory task

The nature of the advisory task differs for large-scale and small-scale advisory bodies and for research-oriented and policy-oriented advisory bodies. The first classification of advisory bodies relates to the scope of activities of the advisory bodies in France, Germany and Poland, while the second classification is based on the importance of the advisory task. The AFSSE and the CSHPF (France), the UBA and the DFG (Germany), the IMP, the NIOM and the PZH (Poland) can be regarded as large-scale advisory bodies, whereas the CNA and the CPP (France), the SRU and the WBGU (Germany) and the Polish Science Advisory Council

constitute small-scale advisory bodies. The small-scale advisory bodies can all be categorized as policy-oriented advisory bodies, since advising is their main activity. In addition, a number of large-scale advisory bodies also comply with the definition of a policy-oriented advisory body, namely the AFSSE, the CSHPF and the UBA. The AFSSE and the UBA are expert agencies that mainly operate on scientific and technical information in order to answer the advisory requests from their related ministries. The CSHPF is a large advisory council, whose scope of activities encompasses the whole public health domain, in contrast to the specific orientation of the small-scale advisory councils. The remaining advisory bodies – the DFG, the IMP, the NIOM and the PZH – are mainly involved in research activities and can thus be categorized as research-oriented advisory bodies. Their advisory task is largely performed by one of their working groups.

Composition of members

The findings on the composition of members from the advisory bodies in France, Germany and Poland show the same distinction between large-scale and small-scale advisory bodies and research-oriented and policy-oriented advisory bodies. It can be concluded that large-scale advisory bodies appoint scientific experts as permanent scientific staff members, while small-scale advisory bodies are composed of voluntary-operating professionals who hold their main occupation at other institutions. The large-scale, though policy-oriented advisory bodies – the AFSSE, the CSHPF and the UBA – also organize voluntary-operating external experts in ad hoc or permanent working groups or committees next to the operation of their permanent staff members in structured divisions and units.

A remarkable result emerged with regard to the status of members. All advisory bodies indicate that their members act independent from any possibly conflicting interests, although the major part of the advisory bodies lack any written proof to guarantee the independent operation of their members during the advisory process. Only the members of two French advisory bodies – the AFSSE and the CSHPF – are obliged to declare any possibly conflicting interests when appointed and during the advisory process. The policy-oriented advisory bodies include voluntary-operating professionals who hold their main occupation at other institutions. In addition, the two French policy-oriented advisory bodies – the CNA and the CPP – appoint members who hold a non-scientific status, such as legislators and industrial or public representatives. Therefore, the policy-oriented advisory bodies are considered as being unable to guarantee the scientific status of their advisory reports. Due to the inclusion of non-scientific members,

the scientific quality of advisory reports from the CNA and the CPP is still harder to verify. Rocard (CNA) and Hubert (CPP) agree with this conclusion.

4.3 The operating procedure of advisory bodies

The operating procedure of advisory bodies encompasses many activities that proceed from the initiation of the advisory report to the release of the final advisory report. In order to characterize the operating procedure (second research question), to judge the scientific status of the advisory reports (third research question) and to find out to what extent scientific and non-scientific considerations are integrated during the advisory process (fourth research question), this section is subdivided in several headings. The initiation and composition of advisory reports and the characteristics of the final advisory reports are then discussed. In addition, the findings on the involvement of public interest groups at the advisory bodies in France, Germany and Poland are formulated. In Annex 7 the operating procedure is further elaborated regarding the detailed contents of the advisory process.

4.3.1 France

A French decree, issued in 1983, specifies the general operating conditions for French advisory bodies. Moreover, the AFSSE, the CSHPF and the CNA laid down the procedural rules for their advisory process in internal documents.³¹⁻³³ In contrast, the CPP operates in a rather flexible manner.³⁴ Due to the official and regulated nature of the French advisory system, three steps of the advisory process are formally defined: the procedures for submitting a request, the types of advisory bodies questioned and the formats of advisory reports.⁸

Initiation of advisory reports

French advisory bodies are obliged to answer governmental requests for advice. Requests for advice to the CPP and the CNA are outlined in formal letters on behalf of the Minister of Environment.^{33,34} The Health and Environment Ministries submit an annual work program to the AFSSE. In addition, ad hoc, non-anticipated requests often arise during the year, mostly originating from the ministries, but also from environmental and consumer associations. Due to the numerous amount of requests for advice, French advisory bodies have difficulty in providing unsolicited advisory reports.³¹

The AFSSE advises on hazardous environmental agents and their related health risks. Its advisory reports are composed of results from exposure, hazard or risk assessments.³¹ The CSHPF also deal with scientific and technical risk assessments, though its advisory reports include clear policy options and recommendations as well.³² As opposed to the AFSSE and the CSHPF, the CPP and the CNA do not produce detailed scientific and technical knowledge. The French advisory committees generate regulatory advices, in which the development of legislative texts and decrees is considered and governmental measures are pre-evaluated. The latter is illustrated in CNA's advisory report on 'Ozone reduction measures during peak pollution periods'. Moreover, the CPP frequently applies the precautionary approach to its advisory requests.^{33,34}

Composition of advisory reports

The law of 1998 sparked a political discussion in France on the distinction between risk assessment and risk management. According to Hubert (CPP), the debate is still running. In his opinion, risk assessment includes the formulation of policy options, for instance regarding the development of regulations, while risk management specifically deals with the regulatory or decision-making process itself.³⁴

The activities of the AFSSE are formally restricted to risk assessment. Yet the extent to which the technical assessment process enters into the decision-making process varies from topic to topic. According to Zmirou (AFSSE), it is important to preserve a clear boundary between risk assessment and risk management. The AFSSE is able to manage this boundary by allocating risk assessments to its expert committees, which operate independently from the internal departments of the AFSSE. Based on the results of the risk assessments, the internal departments of the AFSSE subsequently formulate policy-oriented advisory reports in which policy options and recommendations are included.³¹ The CSHPF also expresses policy options and recommendations, which are outlined in the conclusive parts of its advisory reports.³² The advisory process of the CNA and the CPP mainly consists of collective discussions on research findings and scientific reviews regarding the advisory topic. These discussions result in policy options and recommendations that reflect the opinions of CNA's and CPP's members. In addition, members of the CPP conduct ad hoc research projects at their home institutions.^{33,34}

Final advisory reports

The CSHPF produces comprehensive advisory reports, some of which are translated into public information brochures.³² The AFSSE releases two kinds of advisory reports, which are respectively produced by its expert committees or by AFSSE's internal departments. The expert reports reflect the consensual opinion from the expert committee; minority opinions might only be expressed in specific cases. Since the expert reports include risk assessments and are produced by scientific experts, they hold a scientific status. Zmirou (AFSSE) remarks that AFSSE's internal reports are intended to be reviewed by external experts in order to verify their scientific quality.³¹

The CNA and the CPP produce concise advisory reports, named 'avis', which reflect the outcome of the discussions between their members. Discussions may result in disagreements as well, though Hubert (CPP) points out that the CPP only produces consensual reports, because its members agree on the appropriate answers to the request at the start of the advisory process.³⁴ Both Hubert (CPP) and Rocard (CNA) remark that they cannot guarantee the scientific quality of their advisory reports, since the CNA and the CPP explicitly rely on the expertise and competence of their members, who do not all have scientific backgrounds.^{33,34}

Involvement of public interest groups

The French government emphasizes the need for more public involvement in the advisory process. Except for the AFSSE, this goal has not yet been achieved in practice. The CPP and the CNA do not undertake public activities, although their advisory reports often stimulate public discussions. Persuasive interests of consulted interest groups are only taken into consideration in isolated cases.^{33,34} In cases of complex issues, the working groups of the CSHPF may consult public interest groups during the advisory process. The interviewees of the CSHPF underline the necessity to strictly separate scientific and public interests.³² Accordingly, Hubert (CPP) remarks that the French government should create more clarity on the organization of public interest groups in advisory and decision making processes.³⁴

Contrary to the minimal public activities of the CNA, the CPP and the CSHPF, the AFSSE holds the formal public role of releasing public information. This role has nonetheless not yet been put into practice through the lack of resources. Furthermore, AFSSE's final draft reports are open to public comments

for three to six months. The AFSSE is free to include these public comments, which has indeed been the case for some reports to date. Zmirou (AFSSE) emphasizes that transparency of the advisory process is a key condition for legitimacy and acceptance. At the same time, he points out that the AFSSE strictly distinguishes its scientific advisory process from its public consultation process.³¹

4.3.2 *Germany*

There are no general rules for the operating procedure of German advisory bodies. The UBA and the DFG have defined their own rules of procedure.

Initiation of advisory reports

The SRU and the WBGU solely aim to produce advisory reports. During one of their first meetings, the newly appointed council members of the SRU and the WBGU select the key advisory topics for the upcoming period. Salomon (SRU) points out that the SRU bases its selection of topics on the urgency for policy development or change in the field of the advisory topic. The WBGU mainly deals with emerging topics in the field of global change. The selection of advisory topics is influenced by (European) developments in environmental politics. The federal government, the Ministry for the Environment or other ministries, may request special reports from both councils, for instance regarding the preparation of international meetings. The SRU and the WBGU do not necessarily have to accept these requests.^{39,40}

The Ministry for the Environment regularly delivers requests for advice to the UBA, for instance on the development of criteria for environmentally-friendly products or on assessment procedures to evaluate health risks of building products. The agency could also initiate an advisory report itself, on condition that it strikes issues at the federal level.³⁷ The working groups of the DFG receive requests for advice via the senate commissions. The sub working group on 'Analyses of hazardous substances in air' mainly needs to advise on complex mixtures of chemicals and on chemicals at active surfaces that may cause toxicological health effects.³⁸ The UBA and the DFG are obliged to fulfill the requests from governmental authorities within an established time period.^{37,38}

Composition of advisory reports

All German advisory bodies review relevant literature and findings from corresponding studies and perform risk assessments. Since each WBGU report should include new scientific information, its council members can also commission German research institutions with narrowly-defined research projects.⁴⁰ Next to commissioning research, the UBA performs research itself in its own laboratories to elaborate upon a specific topic.³⁷

The SRU includes policy options in the middle of its reports and formulates recommendations for policy or research developments in the final part or at the end of each chapter (the latter is applied to main reports).³⁹ The WBGU is known for its so-called ‘guard rail technique’; a management action that is aimed at minimizing risks of global change by setting preventive policy guidelines.⁴⁰ In contrast, the sub working group of the DFG rarely formulates policy options and recommendations and mainly focuses on research and risk assessments. Its advisory reports may include recommendations for further research.³⁸

Final advisory reports

The advisory reports of DFG’s sub working group describe assessment and verification procedures. The outcome of its standardized advisory process reflects unambiguous scientific findings.³⁸ The advisory reports of the UBA are outlined in compact research reports or position-setting texts that reflect the final consensual opinion of the experts involved. According to Seifert (UBA), minority opinions should be expressed more often.³⁷ Grassl (WBGU) points out that deviant opinions of members originate from different understandings of the scientific information, which usually merge during council discussions.⁴⁰ The WBGU and the SRU produce three kinds of reports, that is main, special and policy reports. The latter encompass short, policy-directed statements on important policy issues. Main and special reports are rather comprehensive reports that include scientific knowledge on a range of topics. The advisory reports from the SRU and the WBGU are allowed to include minority opinions, but most usually show a consensual outcome.^{39,40}

All German advisory bodies are able to guarantee the scientific quality of their advisory reports, as these are entirely produced and reviewed by their carefully selected scientific experts.³⁷⁻⁴⁰ The DFG also makes use of external review if in doubt about the scientific quality of its reports.³⁸

Involvement of public interest groups

In general, the SRU and the WBGU do not perform activities beyond advising. However, they also hold the responsibility of raising public awareness.⁸ The SRU may, for instance, decide to produce advice on controversial environmental health issues in order to direct the public discussion to the scientific aspects of the issue. During the advisory process, the council members of the SRU also consult and interview industrial and citizens' interest groups. Public interest groups are however not allowed to actually be involved with the scientific advisory process of the SRU.³⁹ This is also true for the WBGU: its members do not even communicate with public interest groups. Still, the WBGU receives a lot of public comments following the release of its advisory reports. Grassl (WBGU) thinks the council members are personally able to consider important societal aspects through their involvement with public organizations and through their acquired experiences.⁴⁰ The UBA and the DFG do not consult citizens' interest groups either. However, both advisory bodies rather frequently consult industrial interest groups on topics that may influence industrial processes.^{37,38}

The internal operation of the four advisory bodies is highly confidential, only their advisory reports are publicly available on the websites of the German advisory bodies or can be requested. By contrast, the German political system stimulates transparency in the procedural channels and the outcome of the advisory process.³⁶ Accordingly, the interviewees of the SRU, the WBGU and the UBA agree on the accessibility and readability of advisory reports to non-experts, though in practice only the UBA actively produces public brochures.³⁷⁻⁴⁰

4.3.3 *Poland*

The operating procedure of the Polish expert institutions (IMP, NIOM, PZH) clearly distinguishes between the continuous production of basic research projects and the ad hoc production of requested advisory reports. This section only elaborates on the contents of the advisory process.

Initiation of advisory reports

At the national level, the Polish expert institutions are requested to provide scientific information in support of the preparation of laws and legislations in the domain of environmental health, such as the 'Law on Environmental Protection' or the 'Ordinance on Drinking Water'. According to the interviewees of PZH, national requests for advice regarding environmental health issues usually origi-

nate from EU directives.^{43,47} The IMP is located in the most polluted and industrialized area of Poland. Its activities are mainly directed to provide local and regional governmental authorities with practical solutions for small-scale environmental health problems.⁴⁷ The NIOM and the PZH advise on a variety of problematic issues at the national and the regional level.⁴⁵ The IMP, the NIOM and the PZH are obliged to accept requests for advice from the national governmental authorities, in particular from the Ministry of Health. Unsolicited reports may be produced about interesting research findings, which are then presented to the Ministry of Health or to local and regional health authorities.⁴⁷ Conversely, the interviewees of the PZH point out that they are not able to fund the production of unsolicited reports themselves.⁴³ The Science Advisory Council advises the Ministry of Health or the Ministry of Science on actual problems in the medical field, for which it thinks research grants should be awarded. Its Board defines and prioritizes the advisory topics.⁴⁶

Composition of advisory reports

The advisory reports from the Polish expert institutions include the outcomes from health risk assessments, resulting from their own research findings. As soon as a request for advice is submitted, the institutions set aside their daily business to fulfill the request. Besides performing research, their daily business concerns certification, monitoring, provision of expert trainings and treatment of occupationally and environmentally-exposed patients.^{43,45,47} The Science Advisory Council utilizes the research findings from the expert institutions as an input for the production of its advisory reports. During its advisory process, the council members apply statistical analysis and epidemiological techniques. They also formulate a collective opinion on further developments regarding the topic of advice, for which they also take economic and social aspects into account.⁴⁶

Final advisory reports

The advisory reports of the Science Advisory Council are primarily presented to the Ministry of Health and may be transposed to scientific publications. When requested, the report's conclusion includes suggestions or research proposals.⁴⁶ The expert institutions produce two kinds of reports: basic research reports and advisory reports, both of which include options and recommendations regarding further developments on the advisory topic.^{43,45,47} The interviewees of the PZH explain that the reports from the expert institutions are integrated into a final

report by the Chief Sanitary Inspection and subsequently presented to the Ministry of Health.⁴³ The IMP additionally presents its scientific and advisory reports to the media and to certain public parties.⁴⁷

The interviewees of the expert institutions state that they are quite able to guarantee the scientific quality of their reports, because only scientific experts, scientific data and scientific methods are involved with its production.^{43,45,47} In addition, the reports of the NIOM are reviewed by an internal scientific council, which is partly composed of external experts.⁴⁵ Majewski (Science Advisory Council) remarks that the scientific quality of the reports from the Science Advisory Council is guaranteed by the professional status of its council members who discuss unambiguous scientific data. In singular cases, deviant interpretations of the scientific data may result in disagreement, but most of the time the advisory reports of the Science Advisory Council represent the consensual opinion of the council members.⁴⁶ This also applies to the advisory reports of the expert institutions, though the reports of the NIOM should include deficient and controversial information as well.⁴⁵

Involvement of public interest groups

In Poland, public interest groups are hardly involved with the policymaking process, although a general tendency towards more public participation in policymaking is apparent. In the opinion of the interviewees of the IMP, it is not the advisory bodies but the requesting actor, such as the Ministry of Health, which is responsible for communicating the advisory report to the public.⁴⁷ However, the NIOM may inform the public itself when indications for any adverse public health risks result from its research projects.^{45,47} Since some members of the Science Advisory Council hold a chief occupation as counselor, the council is also able to indirectly release its opinions into the public arena.⁴⁶

The Polish expert institutions and the Science Advisory Council do not consult public interest groups; their advisory process is strictly confidential. All interviewees think it would be difficult to add public involvement to the advisory process. Nevertheless, public discussions may indirectly influence or stimulate the initiation of an advisory request or a research project.^{43,45-47}

4.3.4 *In conclusion*

A comparison between the findings on the contents of the operating procedure of advisory bodies in France, Germany and Poland results in a conclusion about the different functions of advisory bodies in the environmental health policymaking

process. The conclusion on the functions of advisory bodies is based on the theoretical definition of the functions of scientific expertise in policymaking (see section 2.2). The second part of this conclusion shows a comparison between the results on the operation of advisory bodies in the context of environmental health (see section 2.4.2).

Functions of advisory bodies in policymaking

The results of advisory bodies' operating procedure demonstrate that each body exerts a legitimating and an instrumental function; all advisory bodies aim to support the environmental health policymaking process by providing policymakers with scientific knowledge regarding potential health risks due to environmental pollution. In fact, the operation of research-oriented advisory bodies – the DFG (Germany), the IMP, the NIOM and the PZH (Poland) – primarily focuses on the instrumental function; they perform risk assessments and formulate the outcomes and related implications for policymaking into their advisory reports. The AFSSE, the CSHPF (France) and the UBA (Germany) also identify and frame the problems in a scientific perspective and thus have an enlightening effect on the policymaking process. The French advisory committees – the CPP and the CNA – and the Polish Science Advisory Council also help policymakers to understand advisory topics from a scientific perspective during the discussions among their members. Their contribution to policymaking has a catalytic effect as well. The German scientific advisory councils – the SRU and the WBGU – additionally carry out an interpretative and catalytic function, since they advise on emerging policy issues that should be put on the policy agenda. By means of their advisory reports, the SRU and especially the WBGU assist policymakers in reflecting on the importance of policy issues and stimulate policy progress in the domain of environmental health.

Operation in the context of environmental health

The interviewees expressed their opinions on the position of advisory bodies in the risk assessment process within their country. A recent law in France was aimed at redefining the demarcation between risk assessment and risk management, and as a result several, recently created expert advisory bodies, including the AFSSE, have been specifically assigned the task of risk assessment. However, the discussion on the exact allocation of activities in the advisory process to risk assessment or risk management in France is still running. In Germany, the

operating procedure of the advisory bodies demonstrates no clear demarcation between risk assessment and risk management. Only the operation of the sub working group of the DFG is based on the performance of risk assessment. In Poland, risk assessment and risk management are traditionally demarcated and respectively allocated to the ‘scientific world’ and to the ‘policy world’.

All advisory bodies in France, Germany and Poland base their advisory reports on scientific information regarding the topic of advice; during their advisory process, the advisory bodies consult scientific literature and review scientific data from qualified studies with respect to the topic of advice. Subsequently, they perform a risk assessment or even perform their own research and make use of in-depth, mostly internally organized, review procedures to verify the scientific quality of their advisory reports. Furthermore, the advisory bodies take non-scientific considerations into account during their advisory process. The mode and extent of performing non-scientific activities, such as consultation of public interest groups, vary greatly per advisory body. One extreme are the small-scale advisory committees in France – the CNA and the CPP – which actively include non-scientific deliberations during their advisory process, since a number of their members represent a non-scientific point of view. The other extreme are the Polish expert institutions – the IMP, the NIOM, the PZH – which rarely consider non-scientific aspects.

4.4 Effects of advisory reports on environmental health policymaking

Advisory reports aim to produce one or more effects in the policymaking process. Policy effects involve alterations in regulations and legislations, but may involve changes in agenda-setting as well, which might eventually result in policy development. It is however hard to assess the exact contribution of an advisory report to a particular policy effect, especially when the policy effect amounts to indefinite changes in policymakers’ attitudes towards the issue. In order to explore the effects of advisory reports in the environmental health policymaking process in France, Germany and Poland (in accordance with the fifth research question), this section discusses the findings on the effects of advisory reports, which reflect the statements of the interviewees about the influence and effectiveness of their advisory reports in policymaking.

4.4.1 France

The final advisory reports of the four French advisory bodies are officially presented to the requesting ministry or ministries. The policymakers accept the

reports, but are not obliged to provide the advisory bodies with any response in return.

All interviewees indicate that their advisory reports have an important effect on the environmental health policymaking process.³¹⁻³⁴ Hubert (CPP) remarks that it is however often not possible to assess the contribution of the advisory reports to particular policy consequences. The advisory reports of the CPP particularly affect the first phases of the policymaking process; they support the Ministry of Environment in policy definition and policy development.³⁴ This is the same for the CNA, whose reports are mainly utilized by policymakers dealing with air pollution issues.³³ AFSSE's advisory reports assist policymakers of the Environment and Health Ministries in developing regulations regarding environmental health issues. Moreover, AFSSE's public advisory process stimulates public discussions that may indirectly affect the policymaking process as well.³¹ The advisory reports of the CSHPF mainly assist the Ministry of Health in policy implementation of French or European regulations.³²

In defining the effectiveness of French advisory reports, the nature of the advisory topic plays a crucial role. Rocard (CNA) explains that complex and controversial topics more often lead to disagreement among the experts in the advisory process, thereby increasing the likelihood of producing an ambiguous advisory report. Regarding these topics, policymakers also tend to consider a high variety of opinions and aspects. Consequently, advisory reports on complex and controversial topics have less chance to influence the policymaking process.³³ In addition, Hubert (CPP) indicates that the effectiveness of an advisory report largely depends on the amount of interest obtained from the appropriate policymakers. When policymakers are involved with the advisory process, he asserts that the resulting advisory report tends to be more effective than would be the case without their involvement.³⁴ Furthermore, Zmirou (AFSSE) remarks that advisory reports should include data and risk assessments that clearly and convincingly indicate a certain policy direction. He also remarks that it is important to consider the best moment for releasing the advisory report.³¹

The French advisory bodies are not allowed to interfere with the policymaking process. However, the advisory bodies may try to affect the policymaking process in an informal way. The interviewees of the CSHPF, the AFSSE and the CPP indicate that they might contact policy representatives or could initiate a follow-up advisory report on the same topic.^{31,32,34} According to Rocard (CNA), the President of the CNA might purposely distribute CNA's advisory reports to the media and public interest groups in order to increase the follow-up of CNA's recommendations in the policymaking process.³³

4.4.2 Germany

Germany discerns no general rules for the provision of advisory reports in the environmental health policymaking process. The WBGU officially presents its reports to the IMA and to one or more appropriate ministers or state secretaries. The IMA is obliged to report (orally and in writing) on the implementation and policy consequences of WBGU's recommendations. The WBGU and the IMA formally meet once a year to discuss on IMA's response. The WBGU is thus allowed to request an explanation on the opinions of policymakers.⁴⁰ In contrast, UBA's advisory reports are delivered to policymakers within the Ministry for the Environment, who accept and utilize the final reports of the UBA (for instance in preparing an ordinance) as it suits them.³⁷

The German advisory bodies indicate that their advice contributes an important input to the federal policymaking process.³⁷⁻⁴⁰ Parlar (DFG) states that the Ministry of Labour and Economics usually implements the recommended analytical methods of the DFG.³⁸ Furthermore, Grassl (WBGU) indicates that the current German government is quite environmentally-oriented. Therefore at present, the recommendations of the WBGU are implemented on quite a short term.⁴⁰ Whilst the advisory reports of the UBA and the DFG include instrumental knowledge, the advisory reports of the WBGU and the SRU indicate emerging problems and advise on future policy directions, thereby stimulating the agenda setting process.^{39,40}

According to Seifert (UBA), it is hard to trace policy actions back to the recommendations in the advisory reports. The effectiveness of advisory reports in generating policy consequences depends on many factors, such as the nature of the topic, the publication time, the quality of the report, the attitude of policymakers and the modes of interaction during the advisory process. Especially with respect to unsolicited advice, the nature of the topic and a suitable publication date are important in order to receive full attention from the appropriate policymakers.³⁷

The interviewees point out that it is not the role of their advisory bodies to interfere with the policymaking process, nor to influence the consequences of a released advisory report. Nevertheless, they indicate that they could express their opinion on the absence of or limited policy consequences of their advisory reports, by for instance producing a policy paper or another report on the same topic (the SRU and the WBGU), by submitting a press release (the UBA) or by exemplifying certain arguments during personal contact with the responsible policymakers (the WBGU and the DFG).³⁷⁻⁴⁰ In addition, the individual council

members of the WBGU are indirectly able to influence the policymaking process via public lectures and during conferences and meetings at which policymakers are involved as well.⁴⁰

4.4.3 *Poland*

Final advisory reports of the Polish expert institutions (IMP, NIOM, PZH) are delivered to the requesting actor, though in particular cases they are officially presented. Although the expert institutions do not expect a response in return, they do expect policymakers to regard and implement their submitted suggestions. At ministerial level, their reports may contribute to the initiation of research projects or may result in the establishment of laws or legal regulations. Furthermore, their advisory reports might lead to extended and improved collaboration with national or international institutions. However, the interviewees indicate that their advisory reports generate more effect at industrial and local level, due to the more uncomplicated mode of communication.^{43,45,47}

The Science Advisory Council keeps direct contact with ministerial representatives and therefore has more of an opportunity to influence the policymaking process. The council strives for the implementation of its reports, which include science-based proposals for research projects on specific topics. It is often the case that the Ministry of Health rejects the advisory reports, for instance when policymakers perceive a lack of data. After adjustment, the Ministry of Health still often postpones the implementation of the proposals due to the lack of sufficient budget.⁴⁶

Tarkowski (NIOM) points out that Polish policymakers are not yet very much motivated to formulate environmental health policies and consequently they are not really in need of scientific advice on these issues.⁴⁵ Despite this observation, the interviewees remark that a requested advisory report still has a considerable chance of influencing the policymaking process when it addresses the problem and when it includes sound, straightforward and science-based recommendations.^{43,45-47} The effectiveness of reports from the Science Advisory Council is influenced by the importance and nature of the topic, meaning advisory reports on important and current topics are at least discussed during the policymaking process.⁴⁶

The Polish expert institutions have no direct means of influencing the policymaking process. However, Tarkowski (NIOM) remarks that the NIOM has the moral obligation to refer the ministries to their responsibilities when public health risks emerge as a result of policy developments or are revealed by research findings.⁴⁵ In an indirect manner, the expert institutions may stimulate

the follow-up of their advisory reports, for instance by submitting a letter to the appropriate policymakers or by initiating a research project on the topic themselves. Moreover, the expert institutions have the opportunity to contribute to the policymaking process via their participation in Board meetings of the Chief Sanitary Inspection or by attending the expert consultation meetings that are purposely organized by the ministries.^{43,45} The Science Advisory Council is able to exert direct influence on policymaking at times when ministerial representatives attend its meetings.⁴⁶

4.4.4 *In conclusion*

The interviewees are all quite positive about the effects of their advisory reports, which is no surprising outcome in the light of the announced goal of the research project: exploring the role of advisory bodies in environmental health policymaking. This section relates the various effects of advisory reports to the function of the advisory body in policymaking and describes the conclusions about the effectiveness of advisory reports and about their methods and approaches for influencing the policymaking process.

Effects of advisory reports

The advisory bodies in France, Germany and Poland produce very different types of reports, ranging from research assessment reports to policy papers. They deliver their reports to the appropriate policymakers within national governmental authorities who deal with environment and health policy issues. All interviewees indicate that their advisory reports influence the environmental health policymaking process, since it is their task to support policymaking authorities by producing well-grounded advisory reports on environmental health issues. However, the various advisory reports affect the environmental health policymaking process in different ways. Some advisory reports provide policymakers with constructive scientific information for developing regulations or legislation, while others stimulate agenda setting of emerging policy issues.

It is noticed that the effect of an advisory report relates to the major function of the advisory body in the policymaking process. The research-oriented bodies – the DFG (Germany) and the IMP, the NIOM and the PZH (Poland) – exert an instrumental function. Accordingly, their advisory reports contain scientific and technical information on potential implications and uncertain aspects related to the advisory topic, as a result of which policymakers can make a rational policy decision. The advisory reports of the policy-oriented advisory bodies – the

AFSSE, the CNA, the CPP and the CSPHF (France), the UBA, the SRU and the WBGU (Germany) and the Science Advisory Council (Poland) – frame the advisory topic in its societal context and thus exert influence in the first phases of the policymaking process, when the development of a policy is discussed or even still needs to be initiated. The effects of their advisory reports comply with their functions in policymaking, covering an enlightenment, interpretative or catalytic function.

Effectiveness and influential tools

The effectiveness of advisory reports in the policymaking process is influenced by many factors. This paragraph highlights three factors that are mentioned by almost all interviewees. The interviewees firstly emphasized the scientific quality of their advisory reports. Their reports should always include sound and straightforward scientific knowledge regarding the advisory topic, since it is their obligation to produce science-based advisory reports. Moreover, the nature of the advisory topic influences the effectiveness of an advisory report. Reports on complex and controversial issues are likely to be one of the many inputs that are considered during policymaking. These advisory reports therefore have less chance of producing an effect in policymaking than advisory reports on straightforward topics have. In the third instance, the interest of the appropriate policymakers regarding the advisory topic is considered of high importance.

Participation of policymakers with the advisory process is likely to raise their interest in the advisory topic and consequently increases the effectiveness of the resulting advisory report in policymaking. In order to indirectly stimulate the interest of policymakers, advisory bodies should plan the most suitable publication date and formulate their advisory reports in a comprehensible manner, so that they are of direct use to policymakers.

In order to stimulate the follow-up of policy options or recommendations of advisory reports in policymaking, the advisory bodies may use influential tools oriented towards obtaining the interest of policymakers for their advisory reports. The policy-oriented advisory bodies have better opportunities for influencing the follow-up of their advisory reports, since they more often maintain direct contact with policymakers.

4.5 Bilateral co-operation and networking at the European level

The increased production of environmental health policies at the European level and the growing obligations for European member states to implement them,

pose an ever greater challenge to the national policymaking authorities and their related advisory bodies. Mutual co-operation between advisory bodies operating in the environmental health domain may contribute to resolving common national or transnational environmental health issues.⁴⁹ This section provides an overview of the opinions of the interviewees regarding the opportunities and desirability for bilateral co-operation and networking between advisory bodies from various European countries. The results from this section will make it possible to answer the sixth research question.

4.5.1 *France*

All French interviewees agree on the value of extended transnational co-operation between national advisory bodies.³¹⁻³⁴ The AFSSE is already quite active in creating contacts with advisory bodies in other EU member states and participates in transnational and European projects.³¹ The CSHPF expects to become more active at the European level in the near future.^{31,32} Rocard (CNA) remarks that it would be hard to create co-operation between advisory bodies at the European level, because of the language barrier and the divergent cultural and political backgrounds between the countries, while Zmirou (AFSSE) and the interviewees of the CSHPF believe that various modes of co-operation between national advisory bodies are desirable and possible, ranging from exchanging reports to the establishment of joint working groups.³¹⁻³³ According to Hubert (CPP) transnational co-operation can best be established between advisory bodies with similar characteristics and with the same level of influence in the policy-making process. He is therefore of the opinion that a network of advisory bodies should not involve high-level bodies, bodies with a regulatory role and technical institutions or agencies.³⁴

4.5.2 *Germany*

The German policymaking authorities and their advisory bodies strive to include all available national and international scientific knowledge, and German advisory bodies are therefore quite active at the European level. The UBA and the DFG participate in joint European research projects and the German scientific advisory councils – the SRU and the WBGU – and the UBA participate in the Network of European Environment and Sustainable Development Advisory Councils (EEAC) and regularly visit congresses and symposia in other European countries.³⁷⁻⁴⁰ According to Parlar (DFG), formalized co-operation among scientific institutions at the European level is helpful to manage common problems

and is even necessary in order to keep pace with international scientific developments.³⁸

Despite the broad European-oriented activities of the German advisory bodies, co-operation with other advisory bodies in European countries is minimal and mainly based on personal and informal contact.³⁷⁻⁴⁰ Grassl (WBGU) remarks that it is best for formal collaboration between advisory bodies to be organized by European actors.⁴⁰ In addition, Salomon (SRU) believes that co-operation between advisory bodies by means of mutual peer reviews, the production of joint reports and the exchange of experts can only be achieved when advisory bodies produce English reports on European-oriented topics.³⁹ With respect to the establishment of a common network of advisory bodies, the German interviewees stress the necessity for a strict co-ordination in order to prevent logistic and organizational problems.³⁷⁻⁴⁰

4.5.3 *Poland*

The Polish expert institutions participate in scientific meetings, forums and trainings, organized at the European level and exchange reports and scientific data with institutions in other European countries.^{43,45,47} The Science Advisory Council is not involved with any co-operation at the European level, though Majewski (Science Advisory Council) recognizes the value of a unified organization of scientific expertise at a European level.⁴⁶ The interviewees of the IMP believe that European co-operation is very important to exchange and learn from each others' experiences.⁴⁷ In addition, Tarkowski (NIOM) remarks that networking is a useful tool for reflecting the effectiveness of scientific advice.⁴⁵

4.5.4 *In conclusion*

All interviewees agree on the value of intensifying mutual co-operation between national advisory bodies at the European level. With respect to intensifying bilateral co-operation, most interviewees consider mutual expert consultations, bilateral peer reviewing and exchange of advisory reports to be feasible. Several advisory bodies already have mainly informal, bilateral contacts with advisory bodies in other European countries. Most advisory bodies are also active at the European level, at least through participation in European scientific meetings and forums. In addition, all German advisory bodies participate in European networks. For several large-scale advisory bodies – the IMP, the NIOM (Poland), the AFSSE (France) and the DFG (Germany) – it is verified that one or more of their members have a seat or are selected for one of the scientific committees of

the Health and Consumer Directorate-General, on which they act in service of the European community*.⁵⁰

The interviewees generally agree on the value of an organized network of similar advisory bodies by means of which joint statements on environmental health issues of common interest could be produced. Accordingly, the interviewees speculated on the best way to organize a network of national advisory bodies at the European level. They emphasized their serious consideration of what types of advisory bodies should best be involved in a network of advisory bodies. The advisory bodies are largely divergent regarding their research and policy interests, their ways of reporting, their staff size and their present involvement at the European level. They also perceived the need to decide on the main issues the advisory bodies could co-operate on. Lastly, the interviewees advised to observe and analyze the organizational forms and the work of other co-operative networks at the European level.

* In the 'list of experts appointed as members of the scientific committees', only the main occupations of members are stated. Since policy-oriented advisory bodies include members who hold their chief occupation at other institutions, it cannot be verified if these advisory bodies are represented in the scientific committees.

Conclusion

This final chapter relates the theoretical considerations on the internal operation and the operating context of advisory bodies to the findings of the research project in order to achieve the main and second aim of the thesis, which are as follows:

The main aim of this thesis is to explore the role of advisory bodies in national policymaking, focusing on the effects of advisory reports in the environmental health policymaking process.

The second aim of this thesis is to explore the value of bilateral co-operation and networking among national advisory bodies at a European level.

The final remarks (see section 5.4) draw a conclusion about the achievement of the main and second aim of the thesis. This chapter firstly outlines the conclusions on the analysis of twelve advisory bodies in France, Germany and Poland by drawing a final comparison of advisory bodies in France, Germany and Poland (see section 5.1). In section 5.2, the answers to the research questions are discussed. The thesis concludes with two recommendations regarding national advisory bodies that operate in the environmental health domain (see section 5.3). These recommendations aim at providing members and staff of advisory bodies, and policymakers with the means for reflection on the organization and operation of their advisory bodies.

5.1 Final comparison of advisory bodies in France, Germany and Poland

The three final comparison tables of France, Germany and Poland link the results of the research project per country to the characterization framework. From these comparison tables conclusions are formulated about the national operating context of the advisory bodies. The role of the advisory bodies in environmental health policymaking is discussed in the second part according to the characteristics of their internal operation.

France has an adversarial policy style, entailing a bureaucratic consultative policy approach. The position and operation of French advisory bodies are clearly stated in procedural rules. Requests for advice are directed to particular advisory bodies and contain well-defined questions which request scientific knowledge on a demarcated topic in the domain of environmental health. Accordingly, the French advisory system demonstrates a decisionistic approach, which is illustrated by the bureaucratic interaction process between advisory bodies and policymaking authorities. The CNA and the CPP include policymakers and legislators as full members of their advisory bodies and their operation therefore reflects a continuous dialogue between science and policy, leading to policy learning and progress in environmental health policymaking. At present, the French political system demonstrates a shift towards a mediative policy style, stimulating public actors to become more involved with the policymaking process.

The German policy style demonstrates a corporatist character. The policymaking process is operated by means of negotiations amongst a range of actors trying to influence its direction. During the negotiation process, the input of scientific and technical knowledge is considered of high importance. Advisory bodies provide policymakers with scientific knowledge in order to support policy progress in the domain of environmental health. Hence, the interaction between advisory bodies and the policymaking authorities holds a technocratic nature. In addition, the SRU and the WBGU try to facilitate environmental health policymaking by providing insights and arguments on emerging environmental health issues. However, they do not really aim at discussing their viewpoints with policymakers. Therefore their interaction process with policymaking authorities reflects a combination of the technocracy model and the advocacy models.

Table 2 Final comparison of advisory bodies in France.

Advisory body	Interpretation of science	Function of science in policymaking	Interaction process	Operating procedure
AFSSE	<ul style="list-style-type: none"> • Science as social embedded actor • Post-normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function • Enlightenment function 	<ul style="list-style-type: none"> • Decisionistic approach • Bureaucracy model 	<ul style="list-style-type: none"> • Boundary work as construction process • Production of scientific knowledge in a societal context
CNA	<ul style="list-style-type: none"> • Science as authoritative actor • Post-normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function • Enlightenment function • Catalytic function 	<ul style="list-style-type: none"> • Pragmatic approach • Policy-oriented learning models 	<ul style="list-style-type: none"> • Boundary work as coordination process • Production of scientific knowledge in a societal context
CPP	<ul style="list-style-type: none"> • Science as authoritative actor • Post-normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function • Enlightenment function • Catalytic function 	<ul style="list-style-type: none"> • Pragmatic approach • Policy-oriented learning models 	<ul style="list-style-type: none"> • Boundary work as coordination process • Production of scientific knowledge in a societal context
CSHPF	<ul style="list-style-type: none"> • Science as authoritative actor • Post-normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function • Enlightenment function 	<ul style="list-style-type: none"> • Decisionistic approach • Bureaucracy model 	<ul style="list-style-type: none"> • Boundary work as coordination process • Production of scientific knowledge in a societal context

Table 3 Final comparison of advisory bodies in Germany.

Advisory body	Interpretation of science	Function of science in policymaking	Interaction process	Operating procedure
DFG	<ul style="list-style-type: none"> • Science as authoritative actor • Normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function 	<ul style="list-style-type: none"> • Technocratic approach • Technocracy model 	<ul style="list-style-type: none"> • Boundary work as construction process • Production of scientific data
SRU	<ul style="list-style-type: none"> • Science as authoritative actor • Post-normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function • Enlightenment function • Interpretative function • Catalytic function 	<ul style="list-style-type: none"> • Technocratic approach • Technocracy model • Advocacy models 	<ul style="list-style-type: none"> • Boundary work as coordination process • Production of scientific knowledge in a societal context
UBA	<ul style="list-style-type: none"> • Science as authoritative actor • Post-normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function • Enlightenment function 	<ul style="list-style-type: none"> • Technocratic approach • Technocracy model 	<ul style="list-style-type: none"> • Boundary work as construction process • Production of scientific knowledge in a societal context
WBGU	<ul style="list-style-type: none"> • Science as authoritative actor • Post-normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function • Enlightenment function • Interpretative function • Catalytic function 	<ul style="list-style-type: none"> • Technocratic approach • Technocracy model • Advocacy models 	<ul style="list-style-type: none"> • Boundary work as coordination process • Production of scientific knowledge in a societal context

Table 4 Final comparison of advisory bodies in Poland.

Advisory body	Interpretation of science	Function of science in policymaking	Interaction process	Operating procedure
IMP	<ul style="list-style-type: none"> • Science as authoritative actor • Normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function 	<ul style="list-style-type: none"> • Decisionistic approach • Engineering model 	<ul style="list-style-type: none"> • Boundary work as construction process • Production of scientific data
NIOM	<ul style="list-style-type: none"> • Science as authoritative actor • Normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function 	<ul style="list-style-type: none"> • Decisionistic approach • Engineering model 	<ul style="list-style-type: none"> • Boundary work as construction process • Production of scientific data
PZH	<ul style="list-style-type: none"> • Science as authoritative actor • Normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function 	<ul style="list-style-type: none"> • Decisionistic approach • Engineering model 	<ul style="list-style-type: none"> • Boundary work as construction process • Production of scientific data
Science Advisory Council	<ul style="list-style-type: none"> • Science as authoritative actor • Normal science 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function • Enlightenment function • Catalytic function 	<ul style="list-style-type: none"> • Technocratic approach • Enlightenment model 	<ul style="list-style-type: none"> • Boundary work as coordination process • Production of scientific knowledge in a societal context

Policymaking in Poland encompasses a fiduciary policy style. When policymakers are in need of specific scientific knowledge, they recruit expert institutions to produce it within an established time period. Within this time period and with a specified budget, these expert institutions subsequently formulate an advisory report. The interaction process between Polish expert institutions and policymakers is clearly organized according to the engineering model. In addition, national governmental authorities are supported by their scientific advisory councils, which assist policymakers in reflecting on policy issues. The Science Advisory Council is considered a technocratic actor, whose advisory reports gradually contribute to policy progress. Accordingly, the enlightenment model reflects the interaction process between the Science Advisory Council and its related policymaking authorities.

The role of advisory bodies in environmental health policymaking

The role of an advisory body in policymaking is determined by the effects of its advisory reports, although it is also indirectly determined by the contents of its operating procedure. Based on the final comparison tables of the advisory bodies in France, Germany and Poland, a conclusion can be drawn that the role of an advisory body in environmental health policymaking is different for policy-oriented advisory bodies and research-oriented advisory bodies. The two types of

advisory bodies are stated in Table 5 and are compared according to three characteristics of the characterization framework.

Table 5 Comparison between policy-oriented and research-oriented advisory bodies.

Characteristics	Policy-oriented advisory bodies	Research-oriented advisory bodies
Interpretation of science	<ul style="list-style-type: none"> • Post-normal science 	<ul style="list-style-type: none"> • Normal science
Function of science in policy-making	<ul style="list-style-type: none"> • Legitimating function • Instrumental function • Enlightenment function • Interpretative function • Catalytic function 	<ul style="list-style-type: none"> • Legitimating function • Instrumental function
Operating procedure	<ul style="list-style-type: none"> • Boundary work as co-ordination process • Production of scientific knowledge in a societal context 	<ul style="list-style-type: none"> • Boundary work as construction process • Production of scientific data

The role of research-oriented advisory bodies in policymaking is to provide knowledge on the state of science regarding an environmental health topic. This type of advisory body mainly conducts research and performs risk assessments, the findings and conclusions of which are presented to policymaking authorities. The role of policy-oriented advisory bodies is to support the environmental health policymaking process with knowledge on the state of science, based on actual research findings and scientific data, supplemented with knowledge on the societal context regarding the topic of advice. Their advisory reports have an enlightening effect on policymaking: policy-oriented advisory bodies help policymakers to identify and frame problems to make them understand the situation from a scientific point of view. The role of the Polish Science Advisory Council, the SRU and the WBGU (Germany) and the CNA and the CPP (France) is even more extensive: they identify new environmental health policy issues and hence try to stimulate progress in environmental health policymaking.

Both types of advisory bodies practice boundary work, although the concept is interpreted differently for research-oriented and policy-oriented advisory bodies. Whereas the research-oriented advisory bodies construct and strictly maintain the boundary between scientific and non-scientific considerations, the policy-oriented advisory bodies integrate non-scientific considerations with scientific knowledge and thus regard boundary work as a co-ordination process. By means of boundary work, which is nonetheless subject to different interpretations, both research-oriented and the major part of the policy-oriented advisory bodies are able to guarantee the scientific quality of their advisory reports.

The concept of science is also different for the two distinct types of advisory bodies. It can generally be concluded that research-oriented advisory bodies practice normal science, while policy-oriented advisory bodies practice post-normal science. However, the case of the Science Advisory Council in Poland demonstrates that the actual interpretation of science depends on the position of science, which is determined by the national political system. The Polish political system defines advisory bodies as suppliers of scientific data according to the concept of normal science, though in practice Polish advisory bodies may consider societal aspects well. The Science Advisory Council is therefore categorized as practicing normal science, whilst its operation complies with the characteristics of a policy-oriented advisory body. In the theoretical framework, the interpretation of science is further linked to the position of advisory bodies in society. Advisory bodies which practice post-normal science are regarded as socially embedded actors in society, while advisory bodies practicing normal science are regarded as authoritarian actors. However, the final comparison tables illustrate that the research-oriented as well as the policy-oriented advisory bodies in France, Germany and Poland are all, except the AFSSE, regarded as authoritarian actors in the political systems of France, Germany and Poland. The interviewees justify the authoritarian position of their advisory bodies by referring to the acknowledged status of an advisory body as an independent scientific institution, yet most interviewees recognize a shift towards increasing public involvement and more transparency in policymaking. In France, this trend is demonstrated through the socially embedded organization of the French advisory system. For that reason, the recently established expert agency – the AFSSE – is assigned a formal public role, though this role has not yet been put in practice.

5.2 Answering the research questions

The first research question is as follows:

How is the advisory system organized in the political systems of France, Germany and Poland?

The organization of the advisory systems in France, Germany and Poland is fundamentally influenced by their political system. The French advisory system has an official and regulated nature. In France, general operating conditions for advisory bodies and the formats of advisory reports have been defined. Policymakers should submit a request for advice to a particular advisory body according to fixed procedures. The German advisory system entails a fragmented network structure, which results from the complex layered organization of the German

political system. In Poland, the advisory system is controlled by patronage coordination mechanisms.

The second research question links the theoretical findings to the scientific practice of boundary organizations:

To what extent can literature on the interrelation between science and policy, as reflected in the characterization framework, be applied for characterizing advisory bodies in France, Germany and Poland?

The characterization of the French and the German advisory bodies demonstrates a coherent picture on the role and operation of research-oriented and policy-oriented advisory bodies, which respectively complies with the theoretical findings on the scientific practice of normal science and post-normal science. In contrast, the majority of the French, German and Polish advisory bodies holds an authoritarian position in society, which is only in line with the viewpoint of normal science. The literature on the interrelation between science and policy largely, though not completely reflects the scientific practice of advisory bodies.

The third research question relates to the intermediating position of advisory bodies at the boundary of science and policymaking:

How do the advisory bodies in France, Germany and Poland guarantee the scientific status of their advisory reports?

Advisory reports result from a comprehensive advisory process during which scientific methods are applied by the members and staff of the advisory bodies. In spite of their science-based operation, the French, German and Polish advisory bodies cannot fully guarantee the scientific status of their advisory reports, because the impartial operation of members and staff cannot be confirmed, as the major part of the advisory bodies do not ask their members to declare any possibly conflicting interests and some advisory bodies allow their members to represent interests of their home institutions. Consequently, the advisory bodies cannot exclude the interference of interests which are other than scientific during the advisory process. Despite this observation, only the interviewees of two French advisory bodies admit that their advisory bodies are not able to guarantee the scientific status of their advisory reports. The others remark that their mem-

bers are professionals who act in the interest of the advisory body, implying that they pursue the production of science-based advisory reports.

Research question four elaborates on the contents of the advisory process:

In what way and to what extent are scientific and non-scientific considerations integrated during the advisory process of the advisory bodies in France, Germany and Poland?

In general, advisory bodies in France and Germany integrate scientific and non-scientific considerations, whereas the advisory bodies in Poland restrict themselves to the scientific arguments. In Poland mainly research-oriented advisory bodies have been studied. It is concluded that research-oriented advisory bodies consider non-scientific aspects to a lesser extent than policy-oriented advisory bodies do. The advisory process of research-oriented advisory bodies is restricted to the production of scientific data and public interests are generally not taken into account, while policy-oriented advisory bodies place scientific knowledge in a societal context and actively involve non-scientific actors with their advisory process, largely by means of consultation. Furthermore, the political system of Poland does not involve public interest groups during policymaking as much as France or Germany do, and consequently neither Polish advisory bodies are encouraged to make use of the expertise of non-scientific actors.

The fifth research question examines the policy consequences of advisory reports:

What effects do the advisory reports from the advisory bodies in France, Germany and Poland have in the national environmental health policymaking process?

The interviewees of the French, German and Polish advisory bodies remark that advisory reports are seldom directly translated into policy actions. Advisory reports usually exert an effect in an indirect manner; via public discussions or via personal contact with policymakers. The effects of advisory reports are related to the functions of an advisory body in the environmental health policymaking process, which are different for research-oriented and policy-oriented advisory bodies. Policy-oriented advisory bodies especially aim to generate effects in the first phases of the policymaking process, such as agenda-setting and policy initiation, while research-oriented advisory bodies primarily aim to support policymakers in policy development and implementation.

The sixth research question regards the level of co-operation between the advisory bodies:

What opinions do the advisory bodies in France, Germany and Poland have about bilateral co-operation and networking?

The interviewees of the advisory bodies in France, Germany and Poland recognize the value of intensifying bilateral co-operation and of establishing a network for national advisory bodies. At present, most advisory bodies practice bilateral co-operation, though their mutual co-operation is largely based on informal contact. Furthermore, one or more members of advisory bodies participate in a European network or have a seat in a scientific committee of the European Commission.

5.3 Recommendations regarding advisory bodies

The thesis concludes with two recommendations regarding advisory bodies operating in the domain of environmental health. The first recommendation reflects on the internal functioning of advisory bodies, while the second recommendation regards the external 'European' surroundings.

- Advisory bodies should operate according to rules of procedure in order to maintain their status as independent and scientific-operating bodies.

Rules of procedure are a means to guarantee the independent and scientific operation of advisory bodies. Advisory bodies hold an intermediating position at the boundary of science and policymaking. They are established to assist policymakers in the process of policymaking. Advisory bodies perform their various policy-supportive roles by producing advisory reports. Advisory reports include knowledge about the state of science regarding the topic of advice as well as knowledge about related social, ethical and political aspects. Their operational procedure involves continuous boundary work. Rules of procedure may assist advisory bodies in obtaining clarity about the paradoxical nature of their advisory process, by providing a plain outline on the procedures and extents to which non-scientific considerations and actors are included in the advisory process. However, formulating rules of procedure is one thing, but a second effort is required to actually implement them. In the third instance, it is necessary to continuously check the compliance of the rules with the actual operation of an advisory body.

- Regarding transnational advisory topics, advisory bodies should intensify their level of co-operation with similar institutions on a European level.
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In the domain of environmental health policymaking, policy issues with a transnational character are the rule rather than the exception, since the environment does not restrict itself to national borders. A higher quality of scientific knowledge could be reached if advisory bodies from various European member states were to co-operate more intensively. At the same time, national policymakers would be served by more in-depth advisory reports, based on European-wide knowledge, since they have to deal with the implementation of European policies. Hence, intensified collaboration between national advisory bodies might contribute to the improvement of environmental health policies.

In order to intensify the level of co-operation between national advisory bodies, the Health Council of the Netherlands initiated the establishment of a 'European expertise network for science advice on public health'. However, in order to create an active co-operative network of national advisory bodies, the basis of this network should be firmly anchored. It is therefore necessary to develop a solid organizational framework, which can provide a basis for the elaboration of the network. In this respect, registration for the SINAPSE e-network would serve as a logical point of departure (see Box 2).

The European Union recently set up a SINAPSE (Scientific Information Policy Support in Europe) e-network: a digital network in which scientific institutions from European countries can participate. SINAPSE enables its members to share and compare their scientific activities, to focus on particular topics (like environmental health issues) and to have insight into each others' scientific documents. The inserted scientific documents will have an important impact in the policymaking process, since European policymakers are expected to make use of the SINAPSE network in order to strengthen the scientific basis of their policies.

*Box 2 Sinapse e-network.*⁵¹

5.4 Final remarks

Advisory bodies are complexly operating scientific structures, which are able to influence the policymaking process at different levels and to various extents. Conversely, the national political system sets the operating context of advisory bodies and because of this dominates the contents of the operating procedure of advisory bodies. This thesis has described the findings from a comparative research project at twelve advisory bodies in France, Germany and Poland operating in the context of environmental health. By comparing the findings from the

case studies and linking them to the literature on science and policy interactions, this thesis has provided a better insight into the role of advisory bodies in environmental health policymaking.

The thesis reflects the perspective of advisory bodies, mainly through the opinions of the interviewees. As a result of the one-sided focus, the main and second aims of the thesis have not been completely achieved. The main aim of the thesis was to explore the role of advisory bodies in national policymaking, focusing on the effects of advisory reports in the environmental health policymaking process. Due to the partial findings, it has not been possible to draw factual conclusions about the effects of advisory reports in policymaking. Therefore, the role of advisory bodies has been explored on the basis of characteristics regarding the contents of their operating procedure. For similar reasons, the second aim of the thesis relating to the value of intensified co-operation, could only be explored from the perceptions of the interviewees.

In order to create a more complete and reliable picture of the role of advisory bodies in environmental health policymaking, a subsequent comparative research project on the role and operation of advisory bodies should request both the experts at advisory bodies and the responsible policymakers at the governmental authorities to give their opinion on the role of advisory bodies, focusing on the effects of advisory reports in the policymaking process. In order to explore the value of bilateral co-operation and networking among national advisory bodies at a European level, an evaluative research project focusing on the different forms of co-operation between advisory bodies and their effectiveness in terms of practical applications should be performed.

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- A Four styles of policy making and the corresponding roles of scientific expertise
 - B Characteristics of the six models of boundary arrangements
 - C Contacts of participating advisory bodies
 - D Questionnaire
 - E Interview questions
 - F Statements
 - G Background information on each of the twelve advisory bodies

Annexes

A

Four styles of policy making and the corresponding roles of scientific expertise

Style	Characteristics	Role of scientific expertise
Adversarial	Open to professional and public scrutiny	Main emphasis on scientific evidence and pragmatic knowledge
	Need for scientific justification of policy selection	Integration of adversarial positions through formal rules (due process)
	Precise procedural rules	Little emphasis on personal judgement and reflection on the side of scientists Contingent on claims of methodological objectivity
Fiduciary (patronage)	Orientated towards producing evidence	
	Closed circle of 'patrons'	Main emphasis on enlightenment and background knowledge Strong reliance on institutional in-house 'expertise'
	No public control, but public input Hardly any procedural rules Orientated towards producing faith in the system	Based on bureaucratic efficiency Contingent on personal relationships
Consensual	Open to members of the 'club'	Main emphasis on (scientific) reputation
	Negotiations behind closed doors	Strong reliance on expert judgement (also non-scientific experts)
	Flexible procedural rules	Main emphasis on positive attitude Contingent on social status and political position
Corporatist	Orientated towards producing solidarity with the club	
	Open to interest groups and experts	Main emphasis on expert judgement and political prudence
	Limited public control but high visibility Strict procedural rules outside negotiating table Orientated towards sustaining trust of the decision-making body	Strong reliance of impartiality of experts Integration by bargaining within scientifically-determined limits Contingent on senior status within science communities ¹⁶

B

Characteristics of the six models of boundary arrangements

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- 1 Enlightenment model (divergence, primacy with science)
 - Science slowly leads to objective knowledge of the truth and slowly integrates into the policy sphere.
 - Scientific experts do not feel responsible for the transfer, distribution and application of knowledge.
 - Policymakers decide on how to deal with scientific uncertainties in practice.
 - Science and policy tasks are clearly distinguished, which is similar for the scientific and normative values.
 - The relationship between scientific experts and policymakers is pre-
vailed by mutual suspicion and is based on ad hoc contacts.
 - 2 Technocracy model (convergence, primacy with science)
 - Science has an influencing role into the policymaking process; scientific experts may have important positions in policymaking authorities.
 - Scientific experts decide on the input of scientific knowledge in the policymaking process.
 - Uncertainty is a temporary problem, which is resolved by conducting more detailed scientific research.
 - Scientific opinions comprise the most important input into policymaking; normative opinions and layman' knowledge are of inferior importance and legitimacy is no point of consideration.
 - Scientists and policymakers have a confidential and closed relationship.
-

- 3 Bureaucracy model (divergence, primacy with policy)
 - Scientific experts operate in service of policymakers and act as data suppliers.
 - Policymakers recruit scientific knowledge in order to achieve their policy goals.
 - Uncertainty is regarded as a problem that needs to be managed by means of rules.
 - The input of scientific knowledge is strictly regulated by means of rules and procedures, just like the input of other actors and opinions.
 - The interaction process between scientific experts and policymakers is based on a formal, hierarchical relationship.
 - 4 Engineering model (convergence, primacy with policy)
 - Science is outsourced to external experts who function as knowledge recruiters.
 - Policymakers contract scientific experts by delivering detailed orders.
 - Uncertainty is accepted as an inevitable problem that should be handled with.
 - There exists mutual concurrence between knowledge and expertise institutions regarding policy orders.
 - Communication between scientific experts and policymakers expresses a professional relation between client and employee.
 - 5 Advocacy models (divergence, dialogue)
 - Every actor (including scientific experts) can try to influence the policy making process.
 - Policymakers equally allow for the input of expertise from various actors.
 - Uncertainty is regarded as a stimulating factor for discussion.
 - Science plays a facilitating role in reaching a consensual policy outcome.
 - The pragmatic relationship between scientific experts and policymakers allows for demarcation and coordination between science and policy.
 - 5.1 Adversarial model (adjusted engineering model):
 - Every actor in the policymaking process brings forward its own expertise and arguments.
 - The polarization of arguments increases the level of confrontation.
 - 5.2 Dispositional / discourse coalition model (combination of enlightenment, technocracy and adversarial model):
 - The expertise and arguments of various actors is structured and connected by means of heterogeneity management.
-

- Compromises between different actors are necessary for a successful policy.
- 6 Policy-oriented learning models (convergence, dialogue)
- All actors in the policymaking process act as (re)searchers who try to find solutions for common problems by means of deliberations.
 - Policymaking is based on interaction between varieties of actors who represent their own interests.
 - Uncertainty stimulates the learning process.
 - Science is one of the interested parties in the policymaking process.
 - Scientific experts and policymakers have a confidential relationship that is mediated by mutual interaction.
- 6.1 Policy learning model:
- Policymaking is regarded as a research process; policies improve by a continuous learning process during their implementation.
 - Constant dialogues and adjustments of concepts lead to slow progress, though a ruling paradigm may be interrupted by another policy paradigm.
- 6.2 Problem coping model:
- There exists a balance of power between different policy paradigms.
 - Policymaking consists of a continuous trial and error process, which is directed by scientific experts.^{18, 23}
-

C

Contacts of participating advisory bodies

Country	Science advisory body	Executive officer	Expert member
Germany	<i>Deutsche Forschungsgemeinschaft</i> (DFG) – German Research Foundation	Dr Reinhard Grunwald (Executive director)	Prof. Dr Harun Parlar (Head of sub-working group ‘Analysis of hazardous substances in air’, Member of MAK Kommission)
	<i>Der Rat von Sachverständigen für Umweltfragen</i> (SRU) – The German Council of Environmental Advisors	Dr Christian Hey (Executive director)	Dr Markus Salomon (Scientific staff member)
	<i>Umweltbundesamt</i> (UBA) – Federal Environmental Agency	Dr Hans Langer (Deputy executive director)	Dr Bernd Seifert (Director of Department II.I Umwelthygiene)
	<i>Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen</i> (WBGU) – German Advisory Council on Global Change	Prof. Dr Meinhard Schulz-Baldes (Executive director)	Prof. Dr. Hartmut Graßl (Former President until 31-10-2004)
France	<i>Agence Française de Sécurité Sanitaire Environnementale</i> (AFSSE) – French Agency for Environmental Health Safety	Dr Michèle Froment-Védrine (President)	Pr. Denis Zmirou (Scientific director)
	<i>Conseil national de l’air</i> (CNA) – National Council for Air	Mme Sandrine Rocard (Executive director)	Mme Sandrine Rocard (Executive director)
	<i>Conseil supérieur d’hygiène publique de France</i> (CSHPF) – Higher council for Public Hygiene in France	Prof. Isabelle Momas (Director of Section des Milieux de vie / former president until August 2004)	Mme Isabelle Thirouin Mme Caroline Paul Mme Catherine Mir M Jean Adjage (Scientific staff members)

	<i>Comité de la prévention et de la précaution (CPP) – Committee of Prevention and Precaution</i>	Prof. Alain Grimfeld (President)	Dr Philippe Hubert (Scientific expert member)
Poland	<i>Instytut Medycyny Pracy I Zdrowia Środowiskowego (IOMEH) – Institute of Occupational Medicine and Environmental Health</i>	Prof. Jerzy Sokal (Director) Dr. Nina Wuczynska (Executive director)	Dr Maya Muszynska – Graca (Scientific staff member) Ms. Joanna Pruchnicka (Staff member International Office)
	<i>Instytut Medycyny Pracy IM Prof. J Nofera (NIOM) – NOFER Institute of Occupational Medicine</i>	Prof. Wojciech Hanke (Research director)	Prof. Stanisław Tarkowski (Director of the Department of Environmental Health Hazards)
	<i>Rada Naukowa przy Ministrze Zdrowia (Science Advisory Council) – Science Advisory Council for the Ministry of Health</i>	Prof. Dr hab. Med. Jerzy Szczerban (President)	Prof. Dr hab. Med. Sławomir Majewski (Scientific expert member)
	<i>Panstwowy Zakład Higieny (PZH) – National Institute of Hygiene</i>	Prof. Jan K Ludwicki (Director)	Dr Janusz Swiatczak (Director of the Scientific department Communal Hygiene) Dr. Sławomir Garbos (Specialist)

Questionnaire

[Country and name institute]

Questionnaire

Science advisory bodies in the domain of environmental health

Introduction

The objective of this questionnaire is to obtain an insight into the procedures of your science advisory body in the context of a research project of the Health Council of the Netherlands. Background information on this project can be found in the accompanying letter with the subject 'Explorative research project on science advisory bodies in the domain of environmental health'.

The questions have been ordered into five subjects: 'General Information', 'Structure', 'Advisory task', 'Relation science – policy' and 'Cooperation with institutes active in the same field'. The questionnaire consists of 41 questions and 11 pages in total. Most questions are of the multiple-choice type. Click on the check boxes to select your answers. *Please choose one or more options following the instruction at each question.* Completing the questionnaire will take about 30 minutes of your time.

Please return this questionnaire by e-mail (*preference*), fax or post (in the addressed envelope) to Ms EM Kunseler.

I would appreciate it if you could return the questionnaire before *December 13, 2004*.

E-mail: e.kunseler@gr.nl
Fax-number: + 31 70 340 7523

Postal address:
Health Council of the Netherlands
Ms EM Kunseler
PO Box 16052
2500 BB The Hague
The Netherlands

If you have any questions please do not hesitate to contact me by e-mail: e.kunseler@gr.nl or telephone: +31 70 340 7925.

Thanking you in advance for your cooperation!

Yours sincerely,

Eva Kunseler
Research assistant

Questions

General information

- 1 Name interviewee:.....
- 2 Date: - - 2004
- 3 Position within your science advisory body:
- 4 Contact information
Division:
Telephone-number:
E-mail:

NB: Question 5 has been intended for expert members only

- 5 Are you or one of your colleagues willing to cooperate on a personal interview?
More information on the interview can be found in the accompanying letter with the subject 'Explorative research project on science advisory bodies in the domain of environmental health'.
 Yes, I agree to cooperate on the interview
 Yes, my colleague (probably) agrees to cooperate on the interview?
Contact information:
Division:
Telephone-number:
E-mail:
 No

- 6 Would you like to receive the results of the explorative research project?
 Yes
 No
- 7 Could you briefly describe the objective(s) of your science advisory body?
.....
- 8 Year of establishment:

- 9 Does the science advisory body have a statutory status?
In the context of this research project statutory means permitted, required or enacted by statute (written law passed by a legislative body, rule intended to be permanent).
- Yes
- If yes, what is the permanence of your science advisory body? (*One option possible*)
- Standing body
- Ad hoc body
- Other, namely
- No
- If not, you do not need to fill in the remaining questions.
 Please return the questionnaire by e-mail or post to Ms EM Kunseler.

- 10 Does the science advisory body operate under responsibility of an (governmental) authority?
- If yes,
- a What kind of authority is responsible for the science advisory body?
(One option possible)
- In the context of this research project a responsible authority has been defined as a body which takes the liability for the actions of the science advisory body.
- The central (federal) government
- Ministry(ies) / Department(s)
- Parliament
- State / regional / provincial authorities
- Other, namely
- b Is there an official document, which holds a declaration on the independency of the science advisory body from the responsible authority?
- Yes
- No
- No

11 Does the science advisory body deal with other domains of advice besides environmental health?

This categorization of domains of advice has been used in the context of this research project

If yes, which domains? (*More options possible*)

- Ethics
- Food and nutrition
- Occupational hygiene
- Prevention and lifestyle
- Health care development
- Health information
- Other, namely
- Other, namely

No

12 Which environmental health matters are examined at the science advisory body? (*More options possible*)

In the context of this research project environmental health matters have been restricted to the influence of the physical environment on human health.

- Physical agents
- Chemical agents
- Biological agents

13 Which other tasks besides the advisory task does the science advisory body have? (e.g. research, regulatory, legislative.)

.....
.....
.....

14 Does the science advisory body have a working program? (*One option possible*)

- Yes, obligatory
- Yes, voluntary
- No

- 15 Who provides the financial budget of the science advisory body? (*More options possible*)
- The responsible authority
 - Client(s) / requesting actor(s) (if different from the responsible authority)
 - Sponsors
 - Other, namely

Structure

- 16 What is the composition of expert members of the science advisory body?
- Scientific experts only
 - Mix of scientific and non-scientific experts, including (*More options possible*)
 - Stakeholders
 - Public representatives
 - Legislators
 - Consultants
 - Other, namely
 - Other, namely

- 17 Which category represents the overall number of expert members of the science advisory body? (*One option possible*)
- 10
 - 10 < 20
 - 20 < 50
 - 50 < 100
 - > 100

- 18 What is the organizational position of environmental health activities at the science advisory body? (*More options possible*)
- The whole body is oriented towards environmental health activities
 - Department(s)
 - Departmental group(s)
 - Standing committee(s)
 - Temporary (ad hoc) committee(s)
 - Other, namely
 - Other, namely
 - Other, namely
-

- a Which category represents the average number of members concerned with environmental health activities? (*One option possible*)
- 5
 - 5 < 10
 - 10 < 20
 - 20 < 50
 - 50 < 100
 - > 100
- b What is the composition of the part of the science advisory body concerned with environmental health activities? (*More options possible*)
- Permanent expert members of the science advisory body
 - Temporary appointed expert members
 - External experts
 - Consultants (if different from experts)
 - Stakeholders
 - Public representatives
 - Legislators
 - Other, namely
- 19 Do members of the science advisory body get compensation? (*One option possible*)
- Yes, a fixed salary
 - Yes, a reimbursement of expenses (e.g. travel costs)
 - Yes, other namely
 - No
- 20 What is the representative status of members of the science advisory body? (*More options possible*)
- Independent experts
 - Representatives of interests
 - Other, namely
- 21 Do members of the science advisory body have to declare their interests? (*One option possible*)
- Yes, obligatory
 - Yes, voluntary
 - No
-

- 22 Is exclusion of members from a specific topic of advice possible in case of conflicting interests?
- Yes
 - No

Advisory task

- 23 Which category approximately represents the number of advices (reports) produced per year? (*One option possible*)
- 5
 - 5 < 10
 - 10 < 15
 - 15 < 20
 - 20 < 25
 - > 25
- 24 Which category approximately represents the number of advices (reports) produced per year in the domain of environmental health? (*One option possible*)
- 5
 - 5 < 10
 - 10 < 15
 - 15 < 20
 - 20 < 25
 - > 25
- 25 In which language(s) is an advice being published? (*More options possible*)
- Native language
 - English
 - Other, namely
- 26 Which parts, mentioned below, have been included in an advice? (*More options possible*)
- Summary
 - English summary
 - Problem definition
 - Presentation of the questions
 - Procedure
 - Results
-

- Discussion
- Conclusion
- Policy options
- Policy recommendation
- References
- Other, namely

27 Which actor(s) can request an advice of the science advisory body? (*More options possible*)

- The central (federal) government
- Ministry(ies) / Department(s)
- Parliament
- State / regional / provincial authorities
- Local authorities
- Public agencies
- Business agencies
- Unsolicited advice can be given by the science advisory body
- Other, namely

28 Can the science advisory body expect a response from the client / requesting actor on the advice? (*One option possible*)

- Yes, obligatory
- Yes, voluntary
- No

29 Who defines the advisory topics? (*More options possible*)

- Responsible authority
- Client / requesting actor (if different from the responsible authority)
- Negotiation between responsible authority and science advisory body
- Negotiation between client and science advisory body
- Science advisory body itself

30 How are the advisory topics defined? (*More options possible*)

- Narrowly defined (e.g. one or two particular risk questions)
- Broadly defined
- Not defined

- 31 What elements have been included into the risk analysis of environmental health matters? (*More options possible*)
- Risk assessment
 - Risk management
 - Risk communication
- 32 In what way(s) does the science advisory body include research into the advisory process? (*More options possible*)
In the context of this research project the term research has been restricted to investigations.
- Review of existing research results
 - Commissioning research
 - Conducting research
 - Other, namely
- 33 In what way(s) does the science advisory body include external consultation into the advisory process? (*More options possible*)
- Temporary appointment of experts
 - Interview or hearings of external experts
 - Wider consultation e.g. including stakeholders, public representatives
 - Other, namely
 - None
- 34 By whom is an advanced draft report being reviewed?(*More options possible*)
- Individual members of the science advisory body
 - Review board of the science advisory body
 - Independent review board
 - Responsible authority
 - Client (if different from the responsible authority)
 - External experts
 - Stakeholders
 - Public (representatives or organization)
 - Other scientific institute
 - Other, namely
 - None
-

- 35 Which possible public activities, mentioned below, apply to your science advisory body? (*More options possible*)
- The final advice is publicly available
 - Draft reports are publicly available
 - (Some) Meetings during the advisory process are open to the public
 - Information on the advisory process is publicly available e.g. on a website
 - The public can submit comments during the advisory process
 - Interest declarations of members are publicly available
 - The selection of members of the science advisory body is an open process
 - Other, namely
 - Other, namely

Relation science - policy

- 36 In what phase of the policy making process is advice being requested? (*More options possible*)
- Policy indication (Agenda setting / Prioritizing policy topics)
 - Policy formation (Formulation of the policy objectives)
 - Policy development (Elaboration of the policy objectives)
 - Policy materialization (Establishment of the policy design)
 - Policy implementation (Realization of the policy design in practice)
 - Policy evaluation (Comparing the policy objectives and the policy effects in practice)

- 37 Please assess the overall degree of importance of advices of your science advisory body in the policy making process in the domain of environmental health. Choose a grade (0-7, see explanation below) to indicate the importance of advices of your science advisory body.

Explanation		
0 = None	3 = Slightly important	6 = Highly important
1 = Very little importance	4 = Important	7 = Very high importance
2 = Little importance	5 = Between important and highly important	

Co-operation with institutes active in the same field

38 With which institutes at the national level, active in the same field, does the science advisory body cooperate during the advisory process? (*More options possible*)

In the context of this research project cooperation during the advisory process includes all one- and two-sided activities between the science advisory body and other institutes.

Other science advisory body or bodies in the country, namely

.....
.....

University or universities

Research institute(s)

Other, namely

None

39 With which institutes at the European level, active in the same field, does the science advisory body cooperate during the advisory process? (*More options possible*)

In the context of this research project cooperation during the advisory process includes all one- and two-sided activities between the science advisory body and other institutes.

Other science advisory body or bodies in a European country or countries, namely

.....
.....

Other European science advisory body or bodies

Other institute(s) in a European country or countries

Other European institute(s)

Other, namely

None

40 Is the science advisory body part of a network at the national, European or international level? (*More options possible*)

In the context of this research project a network has been defined as a group of people who exchange information, contacts and experience for professional purposes.

Member of a national network, namely

.....
.....

Member of a European network, namely

.....
.....

Member of an international network, namely

.....
.....

None

41 Please indicate the degree of interest of your science advisory body in participating in the *European expertise network for science advice on public health*. Choose a grade (0-7, see explanation below) to indicate the interest of your science advisory body.

More information on this network can be found in an enclosed memo named 'European expertise network for science advice on public health'.

.....

Explanation		
0 = No interest	3 = Slightly interested	6 = Highly interested
1 = Very little interest	4 = Interested	7 = Very high interest
2 = Little interest	5 = Between interested and highly interested	

Remarks

End

Thank you for your co-operation!

Please return the completed questionnaire by e-mail (*preference*), fax or post to Ms EM Kunseler.

E-mail: e.kunseler@gr.nl, Fax: + 31 70 340 7523, Postal address: Health Council of the Netherlands, Ms EM Kunseler, PO Box 16052, 2500 BB The Hague, The Netherlands.

Interview questions

Interview topics

- 1 Position of the institute within the advisory system of the respective country
 - Explanation of the advisory system within the country
 - Position and definition of the institute
 - 2 The advisory role of the institute
 - Explanation of the advisory role
 - The advisory procedure: initiating phase, conceptual phase, discussion phase, writing phase, review phase, final phase, implementation phase, evaluation phase
 - Actors involved with the production of the advisory reports
 - The production of advisory reports
 - 3 Relationship of the institute with the government or legislature
 - Explanation of the relation between the institute and the responsible authority
 - Role of scientific advice in the policy making process
 - Science – policy culture within the country
 - 4 The cooperation with institutes active in the same field
 - Exchange of expertise and knowledge with institutes at the national and the European level
 - Future possibilities and desirability for cooperation
-

Questions

Topic 1

- 1 How is the advisory system within your country formally being organized? Please refer to the input of advice into different levels of the policy sphere.
- 2 Please indicate if the following statements on science advising to governmental authorities or legislature apply to the advisory system within your country. (*Submitted during the interview*)
- 3 What is the position of your institute within the advisory system of your country?
- 4 Could you provide me with additional information on the objectives and procedure of your institute?

Topic 2

- 5 Could you provide me with additional information on the organizational position of environmental health matters within your institute?
 - 6 Could you provide me with information on the advisory role of your institute?
 - 7 Could you indicate the importance of the advisory role of the institute in relation to the other tasks of the institute?
 - 8 Please provide me with additional information on the activities related to a specific phase of the advisory procedure. Please refer to the selected advisory report to exemplify your answers.
 - a Could you provide me with additional information on the initiation of an advisory topic? (When, by whom, why, remit, time period, budget)
 - b Could you describe which processes and activities occur during the conceptual phase? Please refer to the following topics: problem statement (by whom and how), decision on and approach of actors who should be involved, the organizational structure, plan of approach (by whom, contents).
 - c Could you describe how the discussion phase has been organized with regard to the following topics: meetings, division of tasks between the involved actors, consultation?
 - d Please describe how an advisory report is being written and point out the related activities. (By whom, integration of diverse information
-

- and interests, use of risk analysis and research, scientific approach, consultation)
- e Could you exemplify the review procedure of your institute?
 - f Which activities take place during the final phase? Please refer to the integration of the review into the advisory report, communication with requesting actor(s), create support from the public/ industry/ policy makers, release and publication of the advisory report.
 - g Could you describe the possible consequences following the release of an advisory report of your institute? Please refer to the following topics: type of advice (e.g. technical standards, policy recommendations, forecasts, risk assessment), different fields (science, policy, society, industry), and actual implementation of the recommendations or policy options.
 - h Does your institute respond on consequences of the release of an advisory report?
 - If yes, could you describe what this response encompasses?
 - If not, could you explain why not?
 - i Would you like to give any additional remarks on the procedure of producing advisory reports within your institute?
- 9 Could you mention some recent topics in the domain of environmental health on which your institute has been asked to provide advice on?
- a Please explain why *your* institute has been asked to provide advice on *these* topics?
 - b Could you mention some common characteristics of the advisory topics? (e.g. controversial, scientific aspects, conflicting interests)
- 10 Could you exemplify the role of different actors involved with the advisory procedure with respect to the representative status, conflicting interests, financial compensation, confidentiality and the role during the advisory procedure?
- a Please describe how the different actors involved with the advisory procedure are being selected.
- 11 Does a Chair / President supervises the actors during the advisory procedure?
- If yes, what is the role of a Chair during the advisory procedure?
 - If not, how is the advisory procedure being guided?
- 12 Could you draw a profile of the person(s) whose task it is to actually compose the advisory reports of your institute?
- Skills: writing, communication
 - Experience and expertise
-

- 13 What are the requirements on the composition and outline of an advisory report of your institute?
 - a How should the text of an advisory report being formulated to comply with the requirements?
 - b How are different opinions being integrated into an advisory report?
 - c In which way are policy recommendations and options integrated into an advisory report?
- 14 Could you exemplify how societal circumstances or developments reflect in the advisory reports of your institute?
 - a Does your institute take public and stakeholder interests into account during the production of an advisory report on a certain topic?
 - b How is the scientific character of the advisory reports being guaranteed?
- 15 Please formulate your opinion on the following statements about transparency of science advisory bodies and apply them to your institute. *(Submitted during the interview)*

Topic 3

- 16 Could you briefly exemplify the formal relation of your institute with the responsible authority with regard to the following topics:
 - Objectives institute
 - (In) dependency
 - Frequency of contact; contact person(s) / when, e.g. response on advisory report
 - Formality of agreements
 - Budget
 - 17 Could you exemplify the reasons of actors to request for scientific advice of your institute?
 - 18 Could you describe in which ways your institute is allowed to and tries to interfere with the policy making process?
 - 19 Please indicate to which extent the statements on the topics of scientific uncertainty, the science – policy relation, input into the policy making process and public participation apply to the science – policy culture within your country. *(Submitted during the interview)*
 - 20 Could you indicate which factors determine the effectiveness of advisory reports of your institute in influencing the policy making process?
-

Topic 4

- 21 Could you define in which ways your institute exchanges knowledge and expertise with other organizations?
- At the national level
 - At the European level
- 22 What is your opinion on cooperation between science advisory bodies of different European countries in the domain of environmental health?
- a Are the following ways of cooperation between science advisory bodies possible and desirable from your point of view? (*Submitted during the interview*)
- 23 What is your opinion on the initiative of the Health Councils of the Netherlands and Belgium to develop a European expertise network for science advice on public health, including the domain of environmental health (following the background paper on the European expertise network for science advice on public health).
- a Do you have any suggestions for the establishment of this network?

Statements

Question 2

- A restricted set of the main science advisory bodies in the environmental health domain are formally accredited.
- Science advice in the domain of environmental health is being collected by means of contract relations with relevant expert institutes.
- Science advice is being used as a collective resource and discussed in public debates.

Question 15

- Including citizens into the advisory procedure may hamper regulation in the domain of environmental health policy.
 - It is citizens' democratic right to be involved with decisions that affect their lives and consequently with the advisory procedure related to such decisions.
 - Advisory reports should be accessible to non-experts and formulated according to their level of knowledge.
 - Information on the working procedure of a science advisory body should be maintained confidential.
-

Question 19

Scientific uncertainty

- Policy makers should decide how to deal with scientific uncertainties.
- Scientific uncertainties can be reduced by conducting more research.
- Scientific uncertainties can be controlled by means of rules and procedures.
- The science and policy spheres should both accept and try to deal with scientific uncertainties.
- Scientific uncertainties are being regarded as a stimulating factor for discussion.

Science – policy relation

- Policy makers have to request for science advice; there is no autonomous input from science advisory bodies into the policy sphere.
- Science advice has an influencing role into the policy making process.
- Policy makers recruit scientific expertise from relevant institutes if necessary.
- Policy makers set up contract relations with relevant institutes if science advice is needed.
- Science advisory bodies should try to influence the policy making process themselves.

Input into the policy making process

- There is a clear separation between the input of scientific opinions and the input of normative values into the policy making process.
- Scientific opinions are being regarded as the most important input into the policy making process.
- The input of scientific expertise into the policy making process is strictly regulated by means of rules and procedures.
- Science advisory bodies have to compete with each other in influencing the policy making process.
- All actors; for instance scientific experts, industry and public representatives, have similar opportunities in their attempts to influence the policy making process.

Public participation

- Layman' knowledge is of inferior importance into the policy making process.
 - Societal aspects and public or stakeholder interests are not taken into consideration by both science and policy spheres.
-

- During the policy making process public participation and societal input are being requested by policy makers.
- During the policy making process all actors get the possibility to underline and explain the importance of their interests.

Background information on each of the twelve advisory bodies

This Annex includes background information on each of the twelve advisory bodies in France, Germany and Poland, resulting from the questionnaires and interviews. In addition to the results described in chapter 4, this Annex provides information that is not directly of use for answering the research questions, though contributes to a better understanding of the individual advisory bodies. The background information is structured into four subjects: formal objectives, task description, organizational structure and the operating procedure. The last subject describes several steps of the advisory procedure, from initiation to finalizing the advisory report.

France

Agence Française de Sécurité Sanitaire Environnementale

Formal objectives: The AFSSE aims to contribute to the improvement of the French health security by assessing and evaluating environmentally related health risks. The AFSSE presents its scientific and technical opinions to French governmental agencies, on which they might base policy decisions and regulations.

Task description: The AFFSE should produce scientific knowledge on health effects resulting from environmental pollution. Hence, it integrates monitoring

data on environmental factors and health quality collected from French monitoring institutions, for instance data on human exposures to pesticides and biocides in drinking water, food, contaminated indoor and outdoor air and soil. Within this respect, the agency intensively co-operates with other French scientific knowledge institutions and with European and international-oriented institutions. Since monitoring in different media, such as air, soil and water, involves different and thus inconsistent measurements, the AFSSE should advise on ways to enhance the application of comparable monitoring techniques in different media. Furthermore, the AFSSE is assigned by law to produce public information on environment and health topics, but this role has not been clearly developed yet.

Organizational structure: The AFSSE has been established by law in 2001 and has been operational since the beginning of 2003. It is a statutory, standing body placed under responsibility of both the Ministry of Ecology and Sustainable development and the Ministry of Health, Family and the Disabled. These ministries provide the AFSSE with a fixed annual budget. The AFSSE* covers the domain of environmental health and might involve the domain of occupational hygiene and health information in the near future as well. The agency is structured into three internal departments with their associated sections and independent expert committees. These committees are composed of external experts, who are nominated and installed by decree for a time period of 3 years. The expert committees deal with or are planned to deal with chemical hazards, indoor and outdoor air pollution, and physical agents, such as noise and electromagnetic fields. A fourth sub committee on chemical hazards will focus on the European procedures in health assessments and risk assessments related to biocides. The members of expert committees meet on average every two months. As part of an expert committee, working groups can be established, whose members meet more frequently. A president supervises the expert committees. Ad-hoc groups may additionally be created when the topic does not fit into a committee's activities, or when the defined time period is very limited. An ad-hoc group includes experts from the expert committees and from other French expert institutions.

Operating procedure: The internal committee of the AFSSE first discusses an official request of advice. This committee analyses the request and decides on the kind of expertise needed and on the best way the request should be dealt with, respectively by an expert committee or by an internal department with support

* At 5 September 2005, AFSSE has been renamed AFSSET: Agence Française de Sécurité Sanitaire Environnementale et du Travail.

from one or more sister institutions. Each request is being examined separately. When an expert committee is charged with the request, the President of the committee and AFSSE's internal committee subsequently discuss on the formulation of the questions, the provision of internal expertise, the division of tasks between AFSSE's internal departments and the external committee and the achievable time period. The internal experts of the AFSSE or sister agencies provide the expert committee with important background information, such as literature reviews and data analysis. The expert committee reviews and completes this internal information. Its final report includes scientific results and is presented to the AFSSE, which subsequently formulates policy recommendations based on the scientific information. Thus a request for advice usually results in two advisory reports; a report of the committee and an advice of AFSSE's internal departments. AFSSE does not interfere with the review process of the reports of the expert committee. Reports produced by AFSSE's internal departments (with or without support of sister agencies) are reviewed by the head of the responsible department. In the near future, the AFSSE would like its internal work to be reviewed by the expert committees for the reasons of quality assurance and independent expert review. In case of important and specific requests or disagreement among the experts involved, the scientific committee of the AFSSE should be involved with the review procedure, which however has not been occurred yet.

Conseil National de l'Air

Formal objectives: The CNA holds the objective to advise the Ministry of Ecology and Sustainable Development on air-related subjects, such as air pollution monitoring, newly defined air pollutants or emission reduction strategies.

Task description: The most important task of the members of the CNA is to exchange information and to discuss on air-related topics. Discussions may result in advices on legislative texts, decrees, and scientific subjects, and may regard the development of a specific program by the government or the ex-ante evaluation on the impacts of a governmental measure.

Organizational structure: The CNA has been established in 1997 by decree, following the Law on air of 1996 and has been operational since March 1998. It is a statutory standing body under responsibility of the Ministry of Ecology and Sustainable Development. The council consists of 31 members and receives secretarial support from the Ministry. The secretariat has a main task in writing the reports of the CNA. For specific topics, working groups may be established, who

receive a limited budget. Members of the CNA are appointed for a time-period of three years. The selection of members is fixed by decree; the CNA should include all air-related expertise fields and therefore the selected expertise institutions, public institutions and legislative authorities are requested to nominate a member for the CNA. Membership is voluntary; members only receive a reimbursement of expenses. The President and the secretary obtain a fixed salary. The President of the CNA supervises the meetings and organizes the discussions, which take place about four times a year.

Operating procedure: In practice only the Ministry of Ecology and Sustainable Development requests for an advice of the CNA, although other ministries are allowed to request for an advice as well. The council itself can initiate an advisory topic, when all members agree on the importance of the topic. The requests, problem definition and draft reports are discussed and rephrased or reframed if necessary during CNA's meetings. All members are involved with the advisory procedure, although according to the competence of the members, some members can be more involved with a topic than others. After the meeting, the secretariat and the president write a draft report, which is subsequently sent to all members for review. Their comments are included and eventually discussed during a next meeting. Consultants can be additionally heard, in case the members do not hold all necessary expertise. The secretariat and the President decide upon the need for consultancy of external experts.

Comité de la Prévention et de la Précaution

Formal objectives: The CPP holds the objective to evaluate the state of the art regarding actual issues in the domain of environmental health and to formulate recommendations to governmental authorities on policy and research programs. Through this, the CPP contributes to policy development in the topic of advice.

Task description: The CPP draws attention to susceptible environmental issues influencing human health, evaluates environmental health risks and brings together the fields of scientific expertise, research and regulations into its policy recommendations. The CPP usually applies the precautionary principle or regards management possibilities of environmental health matters.

Organizational structure: The CPP has been established in 1996. It is a statutory, standing body under responsibility of the Ministry of Ecology and Sustainable Development. The CPP covers the domain of environmental health, as well as

the domains of food and nutrition and prevention and lifestyle, and puts its emphasis on the precautionary principle. The CPP consists of a small number of members who produce the reports together, although on specific cases working groups can be organized. CPP's members are appointed as permanent members, without a limited time period. Its members are selected among diverse scientific domains. The CPP has a permanent secretariat, provided by the Ministry of Environment, which assists the committee members for instance in the formulation of questionnaires and minutes. The secretariat has a main task in writing the reports. The Ministry provides an annual budget, mainly allocated to the secretariat. The members do not receive a salary from the CPP; the institutions in which they perform their permanent occupation, pay their time spent to the CPP. A president or deputy president supervises CPP's meetings, which take place once a month and on average take five hours.

Operating procedure: A request for advice from the Ministry or a self-initiated topic for advice is discussed among the members of the CPP, in first instance regarding the formulation of the questions; the questions should address the topic and should not be too narrowly or too broadly formulated. During meetings all decisions are taken, for instance on the necessity to consult external experts regarding a part of the advisory topic. Two to four members of the CPP write the advisory report. The choice of these members should reflect a balance of experienced and inexperienced members and a balance of experts and non-experts in the field of the topic. In addition, the choice depends on the available time of the members. The secretariat has an editorial task and collects the comments and proposals for adjustments on the report. A draft report is sent to all members of the CPP for review. At this, colleagues at home institutions of CPP's members can also be involved, at which they act as external experts. The secretariat includes the comments into the draft reports, which are subsequently discussed during the following meetings.

Conseil Supérieur d'Hygiène Publique de France

Formal objectives: The CSHPF is a scientific and technical expertise institute, charged with the evaluation of public health risks and with the provision of advices on the management of these health risks to the Ministry of Health, Family and the Disabled.

Task description: The CSHPF should advise on European directives, the implementation of French or European policies, the management of risks, assessment

of risks and research developments. Its advices provide essential information for policy decisions on public health. In addition, the CSHPF also deals with local claims, whose importance has risen to a national level. Moreover, the CSHPF holds a public advisory task as well.

Organizational structure: The CSHPF has been established in 1822. It is a standing, statutory body under responsibility of the Ministry of Health, Family and the Disabled. The CSHPF is structured into four sections: water, living environment, infectious diseases and radioprotection. Each section of the CSHPF consists of 23 members supervised by a president and a vice-president. Within a section, permanent and ad-hoc working groups can be created to deal with specific topics, such as the permanent working group on housing. These working groups are the main producers of CSHPF's advisory reports. The secretariat of the CSHPF is closely linked to the council activities, although its involvement will be decreased in the near future. It proposes several selection possibilities for members of the CSHPF to the Ministry of Health. The secretariat selects the candidates according to following conditions:

- The candidate has to agree on his or her voluntary contribution to the CSHPF, while at the same time be available to spend a lot of his or her time to the council activities.
- The members of the CSHPF should cover a broad range of expertise.
- The candidate should be a qualified expert and be able to act independent of any industrial interests.

CSHPF's members meet once a month. During a first meeting a request for advice is discussed and during the next meeting the council usually already approves of the produced advisory report.

Operating procedure: Mainly, the Ministry of Health, Family and the Disabled requests the CSHPF for advice on regulatory texts, although other ministries are allowed to submit a request for advice as well. The advisory reports should generally be produced within a short time period; the length of it depends on the nature of the topic. With regard to uncomplicated advisory topics, the responsible section of the CSHPF selects a reporter who is assigned to produce an advisory report within two months. Staff members of the secretariat prepare and edit the reports in co-operation with the reporter. For complex topics, the responsible section may create a specific working group. Consecutively, the production of the final advisory report takes longer, on average six months. During the advisory procedure of the working groups, public and stakeholders can be consulted. The

writing task is divided among the members of a working group. The partial reports are integrated into one final and comprehensive report. The draft advisory report is reviewed by individual members of the section or working group and is subsequently discussed during a meeting. In general, administrative staff members and ministerial representatives join meetings of the section or working group as well.

Germany

Deutsche Forschungsgemeinschaft

Formal objectives: The DFG is a research institution. Its mission is to fund and to promote research in all branches of science and the humanities.

Task description: The main activities of the DFG are to divide the research projects among the research institutes in Germany and to conduct research itself, performed by the commissions and working groups of the DFG. The DFG is responsible for advising Parliaments and public authorities on questions relating to science and research. Furthermore, it provides financial support for research projects, promotes an improved relationship between the private sector and scientists and academics at a national and international level and supports the education of young researchers.

Organizational structure: The DFG has been established in 1951. It is a statutory, standing non-profit private association. The institution is related to the Federal Ministry of Economics and Labor. The DFG includes the domain of environmental health as well as the related domains of food and nutrition and occupational hygiene. The DFG is composed of German science and research institutions and has been structured into an executive committee, a senate with its senate commissions and committees, a joint committee and review boards. The senate commissions and committees actually deal with the advisory role of the institute; they advise DFG's decision-making bodies and provide the scientific base for DFG's recommendations. The Senate commissions are divided into sub commissions, such as the MAK Kommission with its working groups and sub-working groups, for instance the sub-working group on 'Analyses of Hazardous Substances in Air'. The senate commissions of the DFG financially support their commissions and working groups. The MAK Kommission is a standing commission, which receives its budget in three yearly terms. The members and external experts involved receive no compensation from DFG. Members of the MAK

Kommission are selected on the basis of their level of scientific expertise and on the relevance of their past activities. The MAK Kommission orders the sub-working groups to select its members. The sub-working group on 'Analyses of Hazardous Substances in Air' consists of 28 members of which only four fixed members and most confidential guest experts. The selection of experts is based on their level of experience, activities in air analytics and their scientific expertise. The MAK Kommission has to deal with occupational hazardous compounds and works closely with the federal committee for occupational safety and technical security, the federation of German industries, the central association of industrial insurance institutes (main partner) and the German trade union federation. These business and public institutions can request for advice of the DFG as well. The MAK Kommission has a clear regulatory role in recommending on threshold standards for hazardous substances and is supported by its working and sub-working groups. A scientific secretariat is responsible for the coordination of the activities of the sub-working group and the preparation of its meetings, which take place about five times a year.

Operating procedure: The sub-working group 'Analyses of Hazardous Substances in Air' has to develop analytical methods to determine the level of chemical substances in the work area and receives it orders from the MAK Kommission. The sub-working group is composed of experts from the Max Planck Institute, industries, governmental authorities and universities. They are in frequent contact with other DFG working groups, various scientific institutions in Germany and with relevant international networks. Advisory reports need to be produced within a short time period and with a restricted budget. In first instance, the sub-working group defines the exact problem definition of the already narrowly defined request for advice and formulates a strict plan of approach. A two-man secretariat initiates, develops and manages the scientific activities of the sub-working group 'Analyses of Hazardous Substances in Air', thereby taking national and international policy developments into account. Usually one member of the sub-working group develops an analytical method in the laboratory and formulates the theoretical and analytical parts of the report. One or two other members successively verify the method and write the verification part of the report. External experts are often consulted or may even be invited for long-term participation. The sub-working group is also free to proof or immediately accept the analytical method developed by other expert institutions. Only with regard to hazardous chemicals the sub-working group is obliged to develop the analytical methods itself. The scientific secretaries and the individual expert members (and in exceptional cases external experts) review the draft report and

report their comments to the responsible expert and examiners. The head of the sub-working group acts as the chief editor of the report. During a meeting all members have to give approval to the developed analytical method, after which the head of the group presents the final draft report to the MAK Kommission. Comments of the MAK Kommission must be integrated in the final report.

Rat von Sachverständigen für Umweltfragen

Formal objectives: The SRU is a scientific advisory council, whose mission it is to describe and assess the current environmental situation and to report on upcoming trends. The council should identify environmental problems and suggest on possible ways and means to prevent or deal with them.

Task description: The SRU advises on the environmental situation, politics and developments in Germany. It produces recommendations for future actions in environmental politics, which are outlined either into main reports, special reports or statement papers.

Organizational structure: The SRU has been established in 1972. It is an independent, statutory, standing body of the Federal Government and is related to the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The SRU receives a fixed annual budget, which is mainly allocated to administrative activities. The council members receive a reimbursement of expenses. The SRU consists of seven council members, who hold various scientific backgrounds. They are appointed for a four-year term. The Ministry for Environment selects the members of the SRU, based on the field of expertise they would like to be advised on during the next four years. In succession, the Federal Government should acknowledge and appoint the members. The SRU generally includes one or two council members and several scientific staff members who are working on environmental health issues. The council is supported by a scientific and administrative secretariat. The secretariats act independently from any governmental authority. Meetings of the SRU council members take place on a monthly basis and are presided by the chairman, who is selected among its members.

Operating procedure: The SRU discusses and decides on the topics of their advices for the next one or two years. The topics should reflect a balance between the possibility to improve and support the policies on the topic and the available expertise in the council. All council members and scientific staff members are involved with the production of a main report. The main report deals

with all aspects of environmental politics. One council member holds the responsibility for a special report, involving several scientific staff members. Most of the time, the statement papers are entirely formulated by the secretariat. All types of reports should be reviewed and accepted by all council members. By means of a tight plan of approach the SRU strictly defines the timeline and publication date. As the reports should reflect an objective opinion on the topic and the SRU only consists of a small number of members, consultation is extensively used. Consultation takes different forms, including official consultations during meetings, in-depth consultations during personal contact or visits to expert institutions and requests for written expert contributions. Consulted experts may concern industry representatives, members from other German advisory councils, and staff from agencies or NGO's, operating in the field of the topic. The advisory reports of the SRU are largely written by the scientific secretariat. The council members decide on the allocation of tasks to the different staff members. The council members review the writings of the scientific secretariat in three steps:

- 1 The structure and table of contents of a rough draft report are reviewed and discussed among the members of the council and the scientific staff involved with the topic of advice.
- 2 The council members review the general text and its contents.
- 3 The final draft report is reviewed in detail regarding its contents and writing style.

Umweltbundesamt

Formal objectives: The Umweltbundesamt is a Federal agency. It aims at the protection and maintenance of natural resources, the enhanced use of the sustainable development concept and the improvement of environmental protection.

Task description: The UBA monitors the state of the environment, prepares background information for regulatory action, develops environmental quality targets, conducts or orders applied research, recommends on the need for action and cooperates in international committees. All tasks of the UBA are related to each other and are directed towards the production of advisory reports.

Organizational structure: The UBA has been established in 1974. It is a statutory, standing body related to the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. In 1994 the German Institute for Water, Soil and Air Hygiene became part of the UBA and since then environmental health issues are included as well, mainly in the department of environmental hygiene.

This department puts a large effort in extending the integration of health issues into the work of other departments as well. The UBA is structured into four divisions, which have been subdivided into departments and units. The UBA receives a fixed annual budget from the Ministry and additionally searches for other sponsors, such as the European Union, in order to finance specific research projects. Most of the time, one or more units of the UBA produce advisory reports. The internal experts of the UBA are fulltime employees and receive a fixed salary. The UBA may establish standing or temporary commissions to deal with specific issues. Standing commissions of the UBA generally meet twice a year. There is no formal selection procedure for the appointment of new staff or commission members. Experts for the commissions are selected according to their scientific reputation and field of expertise. The external commission members receive a reimbursement of expenses. Several employees generally participate in UBA's commissions as well, of which one of them is assigned as supervisor.

Operating procedure: A request for advice is internally allocated to one or more organizational parts of the UBA, involving two subsequent steps.

- 1 Based on the 'Geschäftsverteilungsplan' (a work distribution plan in which the different responsibilities of all organizational parts have been defined) it is decided which parts of UBA should deal with the request.
- 2 The assigned organizational part of the UBA should decide if it would be necessary to co-operate with other parts in order to produce the advisory report.

Advisory reports are produced following a so-called hierarchical advice development process. The lowest level, involving the unit members, is responsible for writing the first draft. When the involved experts at this level agree on its contents, it is passed on to a higher level within the agency. Actors at this level also add their opinions and expertise on the advisory topic. Supervision and review thus automatically take place at the same time. When approved at this higher hierarchical level, it is again 'sent upstairs'. In the end the final report is signed by a division head or by the president of the UBA. During the advisory process, input from external experts and legislators may be regarded necessary, which can be obtained during workshops and hearings or, in exceptional cases, by their participation in the preparation of an advisory report. The latter has for instance been the case with the Federal Government's Concept on Indoor Air Quality in 1992.

Formal objectives: The WBGU is a high level scientific advisory council that evaluates environmental changes and their related impacts from the viewpoint of sustainability in ecological, social and economic contexts.

Task description: The WBGU reviews research findings on all aspects of global change. It develops and disseminates policy options and recommendations for the Federal Government and the wider public on global change and its consequences in order to achieve sustainable development.

Organizational structure: The council has been established in 1992 by cabinet decision. It is a statutory standing body to the Federal Government, and is related to both the Federal Ministry for Education and Research and the Federal Ministry for Environment, Nature Conservation and Nuclear Safety. The WBGU has been established to prepare the Rio de Janeiro Conference in 1994. After 1994 the council has been charged to present the developments and state of the art on global change issues. The council of the WBGU consists of nine members, appointed for four-yearly terms. Each member has a personal assistant. The budget, provided by the Federal government and the two ministries is allocated to the council members and its secretariat, consisting of eight members. Accordingly, the WBGU members receive a small fixed compensation per year. Scientific staff members and personal assistants of the WBGU members obtain a fixed salary. The WBGU members meet for 1,5 days a month. The Chairman of the WBGU is charged with the supervision and co-ordination of the advisory process.

Operating procedure: Most advisory reports are initiated by the WBGU. The WBGU members select the key topics on which they would like to advise on. The Federal government and two ministries can request for special reports. The WBGU only deals with topics of which expertise is available among its council members; it does not rely on external expert advice to formulate its reports. Nevertheless, external experts are often asked to provide a written contribution. For the period of 2004 to 2009, the German Federal Government did not appoint a member with expertise in environmental health; therefore the WBGU does not produce advisory reports on environmental health matters during this period. During the council meetings the members debate on the advisory topics and focus on consensus building. The council members themselves, their personal assistants and the secretariat are involved with the writing process, at which the

council members decide on the task division. An advisory report is written following a table of contents. Each separate chapter is allocated to and reviewed by a 'leading' reviewer - a member with expertise on the topic - and a second reviewer, who holds no specific expertise on the topic. The chairman of the WBGU has to review the whole draft report and has the final say on the integration of controversial opinions. All council members should unanimously give approval of the final advisory report. Each report should include new scientific information; therefore the WBGU usually commissions small research projects at research institutions.

Poland

Instytut Medycyny Pracy i Zdrowia Środowiskowego

Formal objectives: The Institute of Occupational Medicine and Environmental Health operates on environmental health hazards and focuses on the prevention of environmental related diseases.

Task description: The institute holds many activities, such as training, certification and treatment of diseases resulting from occupational or environmental exposures. The IOMEH includes research as its main and constant task, while the advisory task is only put into practice as soon as a request for advice is submitted.

Organizational structure: The IOMEH has been established in 1950, though its current name has only been given in 1992. It is a statutory body, acting under responsibility of the Polish Ministry of Health. The IOMEH is located in the most polluted and industrialized area in Poland and therefore was aimed to deal with occupational health in the mining and steel industries in first instance. For a time the IOMEH has been a branch of the NIOM, which had to coordinate all occupational health issues in Poland. Due to the large extent of pollution and its health effects, the IOMEH focused on environmental health. Environmental health activities are allocated to several departments, for instance the Department of Environmental Medicine. The IOMEH can roughly be divided into two organizational parts: scientific research departments and a clinical department including a hospital for occupationally and environmentally exposed patients, laboratories, and toxicological and emerging units. The scientific departments are organized according to specific environmental health hazards, such as physical, chemical, and biological hazards, meta-genetics, toxicology, indoor air

hygiene, risk assessment, and epidemiology. Interdepartmental groups involving experts of different departments mostly deal with requests for advice. Usually the person with the most expertise in the domain of the topic supervises the group of experts that deals with an advisory topic.

Operating procedure: Requests from the ministerial level are well defined and are mainly about general problems and the preparation of laws and directives. Requests from the local and regional level are more problematic and diverse, for instance on environmental assessments of areas in Poland, not covered by measurement points. The requesting actor can decide on the outline of a report. The reports are based on research results of the institute. The director of the IOMEH or the head of the responsible research department decides who should be involved, gathers experts from different departments and divides the activities among the experts involved. The experts involved with the advisory procedure meet and discuss on the topic as often as necessary. External experts can be appointed for a certain time period at the institute to be involved with the advisory procedure on a specific topic. Each expert involved has to prepare the part of the report related to its expertise domain. The parts are combined and subsequently discussed by the whole group. Usually one person has the responsibility for writing the final version of a report. This person presents the final draft report to each expert involved for review. During a meeting all experts should agree on the final report.

Institut Medycyny Pracy I.M. Prof. J Nofera

Formal objectives: The main objectives of the Nofer Institute of Occupational Medicine are to improve the quality of life and to positively influence workers' health, the working environment and the working capacity.

Task description: The main task of the NIOM is to conduct research in order to recognize environmental health hazards and to assess to which extent people are exposed to these hazards, resulting in a definition of actual health risks. The institute also serves as an advisory body to several governmental agencies by providing expert statements based on its research results. The NIOM applies to national research programs that require an interdisciplinary approach and therefore co-operates with other Polish research institutions. Other tasks encompass clinical service to medical doctors and the public, educational training and development of training programs in public health on request of the Ministry of Health.

Organizational structure: The NIOM has been established in 1954. It is a statutory, standing body operating under responsibility of the Polish Ministry of Health. The work scope of the NIOM focuses primarily on occupational health, but covers environmental health issues as well, for instance in the Department of Environmental Health Hazards. The institute has been organized into several departments with its sub departments. In addition, the NIOM includes a school of public health and a research council. The NIOM receives a fixed budget for statutory activities and the experts involved with statutory activities receive a fixed salary. For additional research or advisory requests, the budget has to be provided by the requesting actor. Usually the director of the NIOM discusses the request with heads of several departments. When a request is accepted, the director will nominate the project leader. A project leader holds full responsibility for the project with regard to scientific, financial and administrative aspects. For specific requests, expert groups can be created to deal with a specific project; the composition is based on the need for expertise, including analytics, epidemiologists and monitoring experts.

Operating procedure: When a request for advice is submitted, the head of a department organises a preliminary discussion on the problem definition, scope of activities and terms of contract, which are integrated in NIOM's formal reply to the request. When the requesting actor agrees on the conditions defined in the formal reply of the NIOM, the necessary experts are brought together. Experts from other Polish institutions, for instance the State Environmental Inspection, are requested to provide particular data or can be temporarily appointed. The frequency of expert meetings depends on the topic and the need for it. Each expert involved has to perform a literature review on the topic in the field of his or her expertise and exemplifies this work during a meeting. The report is thus composed of individual parts, which are integrated by the coordinator of the group into a report. The coordinator sends a final draft report to all experts involved that is being discussed among the group, before sending it to the requesting actor. The requesting actor reviews the report either by making use of internal expertise, by making use of external review or by discussing the report with the project leader of the NIOM.

Państwowego Zakładu Higieny

Formal objectives: The National Institute of Hygiene deals with prevention, diagnosis and treatment of infectious diseases, the assessment of environmental

pollution, the production and control of food and consumer goods and with sanitary engineering and administration.

Task description: The PZH conducts research on preventive medicine and coordinates studies on the effects of environmental pollution on human life and health, including identification, detection and monitoring activities. The institute is also involved with educational activities. The National Institute of Hygiene serves as the Polish Center for Accreditation of products, that meet the environmental health criteria.

Organizational structure: The PZH has been established in 1918 and has been renamed the National Institute of Hygiene in 1923. It is a statutory, standing body under responsibility of the Polish Ministry of Health and Social Welfare. The institute covers the domain of environmental health as well as the domain of food and nutrition, prevention and lifestyle, health care development, health information, epidemiology and microbiology. The institute has 13 branches throughout Poland, managed by the head office in Warsaw. The National Institute of Hygiene is organized into a board of directors, a scientific council, 20 scientific departments, laboratories, research service sections and administrative sections. Several departments and departmental groups are oriented towards environmental health activities, for instance the Department of Environmental Hygiene and the Department of Environmental Toxicology.

Operating procedure: The head of a department selects the experts who can best be involved with the production of an advisory report, including experts from several departments. The involved experts are organized in a commission and discuss and meet as often as necessary. Experts from other Polish institutions can be involved as well. All experts involved write parts of the report. The coordinator of the commission subsequently integrates these parts into a final report, which is subsequently checked by the head of the responsible department. A report of the National Institute of Hygiene is presented to the State Sanitary Inspectorate.

Science Advisory Council for the Polish Ministry of Health

Formal objectives: The Science Advisory Council advises the Ministry of Health on public health topics, including the domain of environmental health, and on developments in medical sciences. In addition, the Council provides the Ministry of Science and Information with its opinions on scientific projects.

Task description: The Science Advisory Council provides the Ministry of Health with science advice on topics related to public health and the Ministry of Science with its opinions on scientific projects and research priorities. Furthermore, the council prepares proposals for the allocation of scientific grants and informs medical institutes in Poland about the possibility to apply to certain grants.

Organizational structure: The Science Advisory Council is a statutory standing body under responsibility of the Ministry of Health. The council consists of 60 experts on average, who hold their main occupation at medical institutes in Poland and are appointed for four years. The composition of the Science Advisory Council has to reflect the medical society in Poland, including national consultants and famous researchers from universities and research institutes. The Science Advisory Council has no budget; therefore its members operate on voluntary basis. Ad hoc committees work on the production of advisory reports in the domain of environmental health. The members of a committee receive compensation during the period they are working on a report. External experts will be temporary appointed in a committee when there is a need for their field of expertise and are recruited by the head of a committee based on their scientific position. The committees meet at locations in the center of Poland, as the members are located among the whole country. There are no requirements on the regularity of the meetings. The whole council meets twice a year during a plenary meeting. The board of directors meets once a month, during which experts and Ministry representatives can be invited.

Operating procedure: The topics or advice are prioritized by the board of the Science Advisory Council, thereby taking the priority setting of the Ministry of Science into account. The board invites experts in the field of the topics and formulates a concept. Following this concept the board discusses with and suggests particular topics to the Ministry of Science. Subsequently the selected topics will be allocated to the committees of the council. A committee formulates detailed proposals for research projects. The head of a committee should formulate the reports, since this person is the most experienced expert in the field of the topic. A project can also be divided into parts; several members of the committee will be involved with writing parts of the report. A council member who has not been involved with the production of the report, but is specialized in the field of the topic, should review the report. In this way conflicts of interest can be avoided. A final draft report is subsequently presented during a board meeting. Several expert members in the field are invited to this meeting and the report will

be discussed. The comments that come up during this meeting should be integrated into the report. A final report is presented to the Ministry of Health.