



Scientific expertise and insights into public policy in France

Final discussion paper

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2024



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This publication is an input to the "Strengthening and connecting ecosystems of science for policy across Europe" project by the JRC. It was prepared to stir up discussion during the online workshop "Science for policymaking in France/L'expertise scientifique et l'éclairage des politiques publiques en France". This event was held on 19th May 2022 and was jointly organised by the JRC and the *Institut national français pour l'agriculture, l'alimentation et l'environnement* (INRAE).

Disclaimer: The original publication of this report was made in French and is available with the reference number JRC130684 in the JRC's Publication Repository. The original report was shortened and adapted to produce the current translated English version.

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JRC130684

PDF

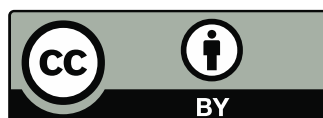
ISBN 978-92-76-56798-1

doi:10.2760/196603

KJ-05-22-292-EN-N

Luxembourg: Publications Office of the European Union, 2024

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How to cite this report: European Commission, Joint Research Centre, Maxim, L., *Scientific expertise and insights into public policy in France*, Krieger, K. and Melchor Fernandez, L. editor(s), Publications Office of the European Union, Luxembourg, 2024, <https://data.europa.eu/doi/10.2760/196603>, JRC130684.

Contents

Abstract.....	2
Acknowledgments.....	3
Executive summary.....	4
1 Introduction.....	6
2 Science for informing public policy in France.....	9
2.1 Public scientific and technological institutions (EPSTs).....	9
2.2 Public industrial and commercial institutions (EPICs).....	10
2.3 Scientific, cultural and professional public institutions (EPCSCP).....	11
2.3.1 The National Museum of Natural History (MNHN).....	11
2.3.2 Universities.....	11
2.3.3 The Grandes Ecoles.....	12
2.4 Other public administrative institutions of the State and independent authorities.....	12
2.5 The Parliamentary Office for the Evaluation of Scientific and Technological Choices (OPECST).....	14
2.6 The Government Departments / Ministries.....	14
2.7 The Academies.....	15
2.8 Associations under the 1901 Act with missions to support public authorities.....	16
2.9 Agricultural technical institutes.....	16
2.10 Organisations with various statuses.....	17
2.11 The expert committees working with the government and the ministries.....	17
2.12 Organisations which mobilise scientific knowledge on an ad hoc basis.....	18
3 Science for policy in France: Challenges and opportunities.....	19
3.1 Autonomy of scientific expertise and political power.....	19
3.2 The role of scientific knowledge in decision-making.....	20
3.3 The relationship between academic and other forms of expertise.....	20
3.4 Coordination and communication between different components and actors of the French science- for-policy ecosystem.....	20
Bibliography.....	21
List of abbreviations and definitions.....	22
List of figures.....	26
List of tables.....	26

Abstract

Science is an essential resource for decision-making. The structure of the interface between science and policy and the associated working processes determine if and how scientific knowledge reaches decision-makers.

This report provides an overview of the structures that operate at the interface between science and policy in France, with a particular focus on two thematic areas: environment and agriculture-food. It proposes a country-specific typology of science-for-policy organisations, established on the basis of their legal status, that differentiates **12 different types of science-for-policy organisations**. Based on this mapping and classification, the analysis identifies several questions to encourage further reflection of the challenges for the ecosystem of science for policy in France. These questions relate to the issues of:

- the **autonomy of scientific expert knowledge vis-à-vis political power**, how this manifests itself in the legal status, and what this implies it more broadly for the role of scientific knowledge in decision-making;
- the recognition and **legitimation of different forms of knowledge for decision-making**;
- the **communication between the various structures** responsible for the same field of action for effective coordination and
- the strategy for **restructuring the ecosystem**.

Acknowledgments

I would particularly like to thank David Demortain and Patrick Flammarion for their support and for our discussions during the writing of this report. A big thank you also to Clémentine Lallier, Nicolas de Menthère, Laurence Rouil, Eric Vial, Nirmala Seon-Massin, Nicolas Lambert, Emilie Klander and Jean-Bernard Kovarik.

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Editors

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Executive summary

The objective of this report is to provide an overview of the structures that operate at the interface between science and policy in France. For reasons of feasibility, two main thematic areas have been selected: the environment, including the risks to public health associated with particular technologies, and agriculture-food.

A **typology of science for policy organisms** is established on the basis of the legal status of the organizations and includes **twelve types**:

1. EPSTs (public scientific and technological establishments);
2. EPICs (public industrial and commercial establishments);
3. Public scientific, cultural and professional establishments;
4. Other public administrative establishments of the State and independent authorities;
5. legislative advisory bodies, such as the Parliamentary Office for the Evaluation of Scientific and Technological Choices;
6. Services in government departments/ministries;
7. Scientific academies;
8. Associations under the French 1901 law with support missions for public authorities;
9. technical agricultural institutes;
10. Organizations with various statutes;
11. Committees of experts established by/active with the Government and Ministries, and
12. Organizations that mobilize scientific knowledge on an ad hoc basis.

Each class is approached in a descriptive way resulting from both a desk research and interactions with representatives of some structures included. A “spider web” type of graph offers a representation of the **ten criteria used to characterize the specific relationship between science and public policies**:

- three criteria relating to the role of knowledge producer, synthesizer or broker,
- two criteria referring to requested or unsolicited input (“science push” versus “government pull” of evidence),
- a criterion concerning the legal status and
- four criteria making it possible to characterize the intervention of the organization in the various stages of the life cycle of the public action.

A first in the literature through its reference to the global structure of the ecosystem of science for policy, in its organizational and legal dimensions, this study shows that the French ecosystem is extremely rich, a sign of public recognition of the legitimacy of science for decision-making.

Carried out over a short period of time, this work must be considered as preliminary to a more in-depth survey of representatives of all the structures described, which would make it possible to characterize more finely the practice of their relations with decision-makers and draw robust conclusions on these relationships. Above all, further work should be able to complete the structure of the ecosystem by including key components such as militant non-governmental associations, consultancies and private laboratories, think-tanks, non-profit structures representing different industries, and science journalists.

Nevertheless, this work allows us to ask a **number of questions** that can guide the reflection on the ecosystem of science for policy.

- (a) The first is the question of the **autonomy of scientific expert knowledge vis-à-vis political power**, and therefore of its ability to alert the latter in the event of a problem, a question which can be translated into three others: that of the mechanisms of formulation of the request for expert input (and in particular of the way of constructing the questions to which the expertise must answer), that of the monitoring mechanisms and their effectiveness, and that of the relationship between hierarchical dependencies and expert working procedures.

- (b) The second question is that of **the link between the legal status of organizations and their relationship with the political power**. The question of the legal status may also arise in relation to the prioritization of issues by the public authorities, particularly on environmental issues.
- (c) A third question would focus on the factors that determine the **reception of knowledge that does not fall within the sphere of immediate concerns of power** but that may be relevant for the governance of issues that concern French society. Overall, we can ask the question of knowledge (voluntarily or involuntarily) "not requested" by the political power, but potentially relevant.

Inside the ecosystem, information flows can be identified between its various components. The issue of communication between the various structures responsible for the same field of action for effective coordination is directly linked.

- A central question for the ecosystem of science for policy is that of the **relationships between the different forms of production and mobilization of decision-relevant knowledge**, and its characterization as "scientific" knowledge or not. Thus, one can reflect on the relationship between academic knowledge and knowledge produced by consulting firms, or between academic knowledge and knowledge produced for regulatory needs by industry or private laboratories, which is often characterized under the name of "regulatory science".
- Finally, faced with the abundance of structures in the French ecosystem, one can ask the question of the **strategy for restructuring the ecosystem**, which seems to be dictated by successive crises.
- A more global question is that of the role **of scientific knowledge in decision-making**.

For all these questions, it can be asked to what extent these would be specificities of the French ecosystem or traits that more generally characterize the relationship between science and policy in European countries.

1 Introduction

While very rich, the literature on the interfaces between science with public policy and, in particular, on expertise, does not provide a conceptual or methodological reference for understanding the overall administrative and legal structure of the ecosystem¹ for an entire country.

An original method has therefore been developed in this report and used to explore two major areas of public action: the environment, including the public health risks associated with particular technologies, and agriculture and food. It is proposed that the **stakeholders of the ecosystem are classified on the basis of the legal status of the organisations**. This makes it possible to both accurately describe their tasks, particularly as regards their interactions with decision-makers, and to accurately distinguish between **12 types of organisations**:

1. EPSTs (public scientific and technical research institutions)
2. EPICs (public industrial and commercial institutions): under the categories of either 'research' or 'data'
3. Scientific, cultural and professional public institutions, the *grandes écoles* and the National Museum of Natural History (MNHN)
4. Other State public administrative institutions of the State and independent authorities
5. OPECST (Parliamentary Office for the Evaluation of Scientific and Technological Choices)
6. Government departments / ministries
7. The Scientific Academies
8. Associations under the 1901 Act providing support to the public authorities
9. Agricultural technical institutes
10. Organisations with various status
11. Committees of experts working with the government and the government departments
12. Organisations that mobilise scientific knowledge on an ad-hoc basis

Four main categories of criteria have been selected to characterise the relationship between science and policy:

- **Criterion #1: The role in the science-for-policy interface** of the producer, the synthesiser or the broker of scientific knowledge (classifications adapted from Gluckman et al. (2021)). According to Gluckman (2018) and Pedersen & Hvidtfeldt (2021):
 - 'Knowledge producers' are the structures that produce scientific knowledge. This category of 'scientific knowledge' includes national and international scientific publications, as well as data obtained using recognised scientific methods (e.g. national statistics, monitoring data, data produced by observatories, etc.), test reports produced by private laboratories or technical reports² for regulatory purposes according to reputed scientific protocols³ (e.g. OECD standardised guides) or contributions made by professional scientists when they are heard by parliamentary committees of enquiry or interviewed by journalists, for example.
 - 'Knowledge synthesisers' assess the available knowledge to extract a message about what it means.
 - 'Knowledge brokers' translate scientific knowledge for decision-makers and decision-maker requirements for scientists.

¹ According to the European Commission, the science-for-policy ecosystem is: '*a complex of organisational structures and entities, and processes, and networks that interact to support the mobilisation, acquisition, synthesis, translation, presentation for use and application of scientific knowledge in policymaking processes*' (URL: https://knowledge4policy.ec.europa.eu/event/jrc-rtd-online-workshop-share-your-views-how-support-connect-policymaking-eu-member-states_enhttps://knowledge4policy.ec.europa.eu/sites/default/files/SWD_2022_346_final.PDF).

² For example, risk assessment reports produced by consultancy firms/manufacturers for the marketing of plant protection products or other chemical products.

³ This type of production falls under the category of 'regulatory science', which is different from 'academic science'.

- **Criterion #2: The origin of the request** for knowledge production through this interface (referral and/or self-referral),
- **Criterion #3: The legal status of the organisation undertaking the interface work**, i.e. the statutory tasks, which require the organisation to have access to policymaking at any given time.
- **Criterion #4: The stage in the public action life cycle**, according to the well-established characterisation : identification/definition of the problem, formulation/decision, implementation, evaluation (Jann and Wegrich 2007) (Table 1).

In Table 1 below, the different categories of organisations considered are characterised according to the ten dimensions used to describe the science-policy relationship. The number of symbol '+' refers to the weight a specific characteristic has in the organisation's overall tasks as defined by its legal status and practice, and come from the subjective assessment of the author of this report, with the exception of four organisations for which the scores have been completed by their representatives (MNHN, INRAE, CIRAD and Gustave Eiffel University).

For example, an organisation will have '+++' for 'knowledge producer' if this is its main mission, as in the case of a research organisation/university, or a single '+' if this is a function that is present but not central to its missions. Alternatively, an organisation with '+++' for the criterion 'problem identification/definition' criterion is more involved in this stage of the public action life cycle than in any other stage. A '-' means that the respective function is not fulfilled at all by the organisation in question. The symbols attributed to each organisation only partially reflect the diversity within each category, and serve as a means to stimulate discussions about the relationship between each legal category and the decision-makers who use scientific knowledge.

It is also important to clarify that these scores characterise the relationship with the public policies of an organisation for the two selected policy areas only (environment and agriculture). Some organisations, such as the CNRS, produce knowledge in a wide range of disciplines and subjects. For this reason, choosing another domain could lead to different scores (for example, the contribution of organisations to research policy or industrial policy).

The idea of this table, together with a representation of the science-policy interface for each category of organisations in the form of a spider web diagram, was taken from Pedersen & Hvidtfeldt (2021), whose criteria have been adapted to this report.

Table 1. Categories of organisations and their functions for the science–public policy relationship

Roles/ organisations	Knowledge production	Knowledge synthesis	Knowledge brokerage	Referral	Self-referral	Legal status	Problem identification	Formulation/ decision	Implementation	Evaluation
EPST	+++	+	+	++	+	++	++	+	+	+
EPST-INRAE	+++	++	++	++	<i>n.a.</i>	<i>n.a.</i>	++	++	++	++
EPIC research	+++	+++	++	+++	+	+++	++	++	+++	+
EPIC-CIRAD	+++	++	++	++	+	+	++	++	++	++
EPIC data	+++	+++	++	+++	+	+++	+	+	+++	++
Universities	+++	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	+	++	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>
Gustave Eiffel University	+++	+++	+	++	+	+++	+	+	++	++
Grandes écoles	+++	+	+	-	-	++	++	+	+	+
MNHN	+++	+++	++	+	+	+	++	++	+	++
Administrative public institutions	+	+++	+++	+++	+	+++	++	+++	+++	+++
OPECST	+	++	+++	+++	+++	+++	+++	+++	+++	+++
Government departments	++	++	+++	+++	+++	+++	+++	+++	+++	+++
Academies	-	++	++	+	++	+	++	+	-	-
Independent authorities	-	+++	+++	+++	+	+++	++	+++	+++	-
1901 Associations	++	++	++	+	+++	+	++	+	+	-
Agricultural technical institutes	++	-	-	+	++	+	+	+	-	-
Organisations with special status	+	+++	+++	+	+++	+	+++	++	+	-
Temporary expert committees	-	+++	+++	+++	-	+++	-	+++	+	++

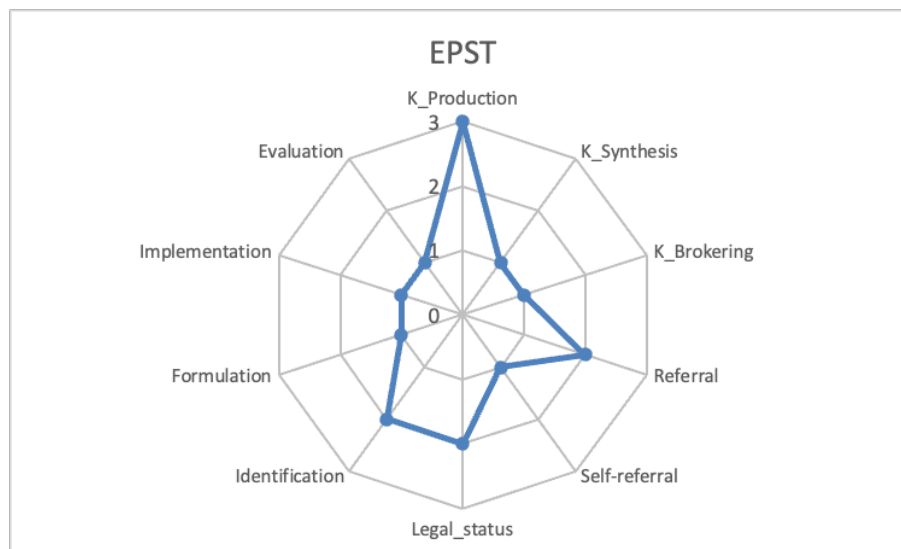
Source: Produced by the author. CIRAD, the Agricultural Research Centre for International Development; EPSTs, public scientific and technological institutions; EPICs, public industrial and commercial institutions; INRAE, the National Research Institute for Agriculture, Food and the Environment; MNHN, the Natural History Museum; OPECST, Parliamentary office for the evaluation of scientific and technological choices.

2 Science for informing public policy in France

2.1 Public scientific and technological institutions (EPSTs)

Public scientific and technological institutions are a category of public institution created in 1982, whose status is governed by the Research Code⁴. Their missions include the conduct and advancement of research in all areas of knowledge; the exploitation of research results; the sharing and dissemination of scientific knowledge; the development of expertise and training in and through research.

Figure 1. Characterisation of EPSTs and their scientific advice for public policy



Source: produced by the author.

Overall, EPSTs represent the bulk of the production of scientific knowledge in France, in the academic sense of the term. The performance of these organisations is measured primarily in terms of the number and level of publications, taking precedence over the other contributions these organisations make to society, particularly in terms of support for public policy. For example, the individual contributions to policy-relevant expertise of such organisations' researchers are not systematically valued in their careers, and in some cases can even work against them when their output in terms of scientific publications is affected.

The degree of heterogeneity within this category can be characterised as 'moderate' when it comes to their public policy support activities. All bodies thus contribute to the 'problem identification' stage of the public action lifecycle by the very fact that scientific activity may reveal issues that subsequently require decision-making (e.g. the vast majority of environmental issues). The contribution to the other stages is more heterogeneous, with some organisations that have a structured interaction with decision-makers (experts unit) which give them a role in the 'formulation/decision' and 'evaluation' stages, some also contributing to the implementation of public policy by producing operational knowledge at the request of the decision-maker.

While all EPSTs fit well into the category of 'knowledge producer', those that organise the integration of collective expertise, in particular, also fall into the category of 'knowledge synthesisers', and none into the 'knowledge broker' category by virtue of an institutional strategy. However, it is important to stress that a brokerage activity takes place through meetings between representatives of EPSTs and those of their supervisory ministries or other decision-makers.

Examples of EPSTs include the National Centre for Scientific Research (CNRS), the National Research Institute for Agriculture, Food and the Environment (INRAE), the National Institute of Health and Medical Research (INSERM) and the National Research Institute for Sustainable Development (IRD).

⁴ Code de la Recherche, https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006071190/

2.2 Public industrial and commercial institutions (EPICs)

The public administrative institution (EPA) and EPIC are the two possible legal regimes for a public institution (PI). They are distinguished by their activities: a public administrative service, for the EPAs (see dedicated section below), or a public industrial and commercial service, for EPICs. The legal status of the two categories is different. While an EPA is governed by public administrative law (its staff is made up of public officials, its decisions are administrative acts and disputes are subject to administrative justice, with some exceptions), an EPIC is governed by private law (its staff members are subject to the Labour Code and are very similar to private sector employees, the contracts it enters into with its users are governed by private law).

EPICs, therefore, together with commercial companies, where more than half of the capital is owned by public sector entities, are the two main categories of public companies. The industrial and commercial nature of an organisation is defined by three characteristics: its purpose is similar to that of a private company (i.e. to carry out an economic activity), its financing is mainly derived from the activity in question, and its organisation and operating methods are distinct from those of the administration.

Most EPICs have research missions or activities (Ifremer, CEA, Andra, IRSN, CIRAD, BRGM, Ineris, CSTB), while others contribute to funding research (ADEME) or produce data in their field of expertise (ONF).

Figure 2. Characterisation of EPICs and their ‘Research’ and ‘Data’ profiles



Source: produced by the author. Left shows the role of EPICs with research missions. Right shows the role of EPICs with the function of producing data for their fields.

Overall, the heterogeneity within this group is relatively significant, with two sub-groups that can be identified – one including organisations with research missions and another with organisations that instead produce data (Figure 2). While all EPICs are producers of knowledge, some are systematically requested by the State in the day-to-day management of their field of competence (e.g. nuclear, natural hazards, agricultural markets), and therefore have an important role as knowledge synthesiser. Compared to EPSTs, EPICs are more involved in the implementation stage of public policy (e.g. through the coordination of observatories, the development of reference tools and methods for regulatory implementation, or through State support missions in crisis situations). When organisations formulate opinions, as is the case with Ifremer, for example, they are also acting as knowledge brokers.

In particular, what characterises EPICs is their legal capacity to respond contractually to both State and private operators’ requests, allowing them to accumulate knowledge of both categories of actors, which then forms part of their overall skills base. Furthermore, private contracts are a source of financing that complements public funding.

Some examples of EPICs: the French Research Institute for Exploitation of the Sea (Ifremer), the French Atomic Energy and Alternative Energies Commission (CEA), the French National Radiactive Waste Management Agency (Andra), the Institute for Radiation Protection and Nuclear Safety (IRSN), the Agricultural Research Centre for International Development (CIRAD), the French Geological Survey (BRGM), the National Institute for Industrial Environment and Risks (Ineris), the Scientific and Technical Centre for Building (CSTB), the Indoor Air Quality Observatory, the Environment and Energy Management Agency (ADEME), the National Forestry Office (ONF).

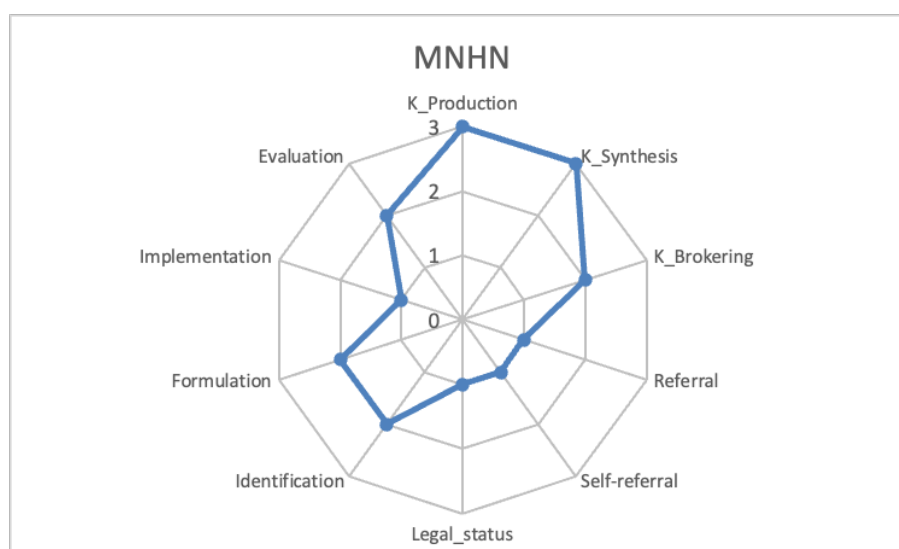
2.3 Scientific, cultural and professional public institutions (EPCSCP)

A scientific, cultural and professional public institution (EPSCP) is a particular category of public institution whose constituent rules are laid down in Book VII of the Education Code.⁵ This status is specifically adapted for higher education institutions and therefore includes universities as well as some fifty other institutions, including engineering schools. The term EPCSCP was introduced in 1984 by the Savary Act⁶ to designate a group of the most prestigious public institutions in the fields of research and higher education.

2.3.1 The National Museum of Natural History (MNHN)

The Natural History Museum (MNHN) falls under the joint supervision of the ministers responsible for higher education, environment and research. Its purpose is to research the Earth and living things from the most remote periods of the past to the present day, in support of the conservation of biological, geological and cultural diversity. The Museum also provides expertise and support for public policy, from the local to international level. It responds to requests from the State or local authorities, on the state of nature, its protection or restoration, on the territories they administer or the land they manage, including through collective scientific expertise. Under the Environment Code⁷, it is responsible for certain tasks (inventory of natural heritage, adaptive management of hunted species, etc.) and supports the French authorities in certain multilateral environmental agreements.

Figure 3. Characterisation of the MNHN and their scientific advice for public policymaking



Source: produced by the author.

2.3.2 Universities

Although they belong to the same legal category, universities and the MNHN are involved in different capacities in expertise, the latter being very active and engaging a specific dedicated service. In universities, an institutionalised policy of expertise seems less common at first glance but this impression would require a dedicated survey for confirmation (or not). Specific strategies for interaction with decision-makers could be put in place in each laboratory or team. As a large number of research laboratories in France are mixed – bringing together researchers employed by research organisations and university researchers or professors – the contribution of academics to expert advice could form part of the EPST/EPIC institutional strategies. The lack of information on what is being done in universities in support of public policy means that no overall graphic representation for universities can be presented.

Lecturers and professors employed by universities may also act as expert advisors on an individual basis.

⁵ Code de l'éducation, https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006071191/.

⁶ Loi du 26 janvier 1984 sur l'enseignement supérieur, <https://www.legifrance.gouv.fr/loda/id/JORFTEXT00000692733>.

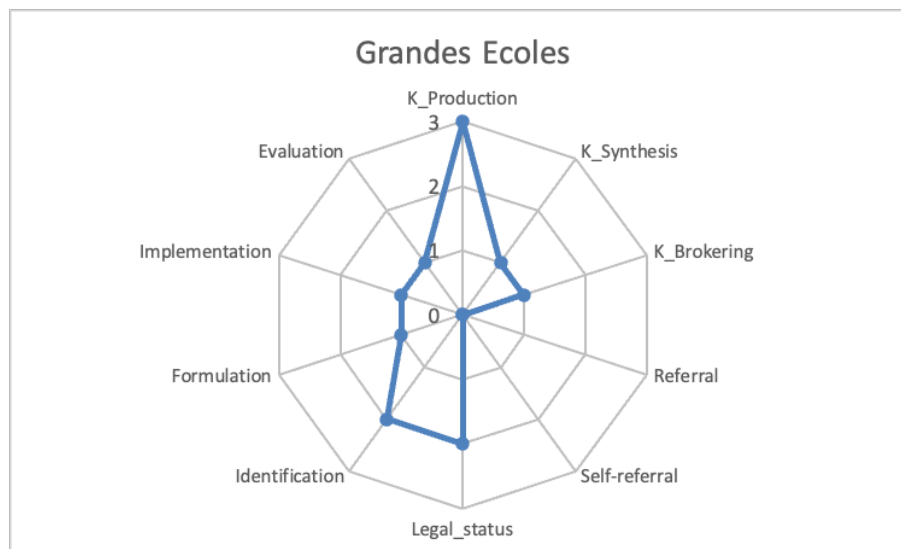
⁷ Code de l'environnement, https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006074220/.

2.3.3 The Grandes Ecoles

The *Grandes Ecoles* recruit their students through entry examinations and provide high-level education, including training for state engineers. These are a small number of bodies designed to train and recruit civil service leaders, who report to the ministries responsible for the civil service bodies: Justice, Health, Armies, etc. These include the Mines ParisTech, the Engref-AgroParisTech (National School of Rural Engineering, Water Resources and Forestry), the École polytechnique, the EHESP (School of Advanced Studies in Public Health), the ENS (Ecole normale supérieure), etc.

Given their objectives, the *Grandes Ecoles* can be closer to the decision-making environment, both through their alumni network but also through the internships that their students can undertake in government structures (ministries etc.) or local and regional authorities. Internships can provide useful knowledge for decision-making, which can be linked to a form of expertise, especially when they deal with issues that are negotiated with the interns' host organisations and are therefore potentially of interest for decision-making.

Figure 4. Characterisation of the *Grandes Ecoles* and their scientific advice for public policymaking



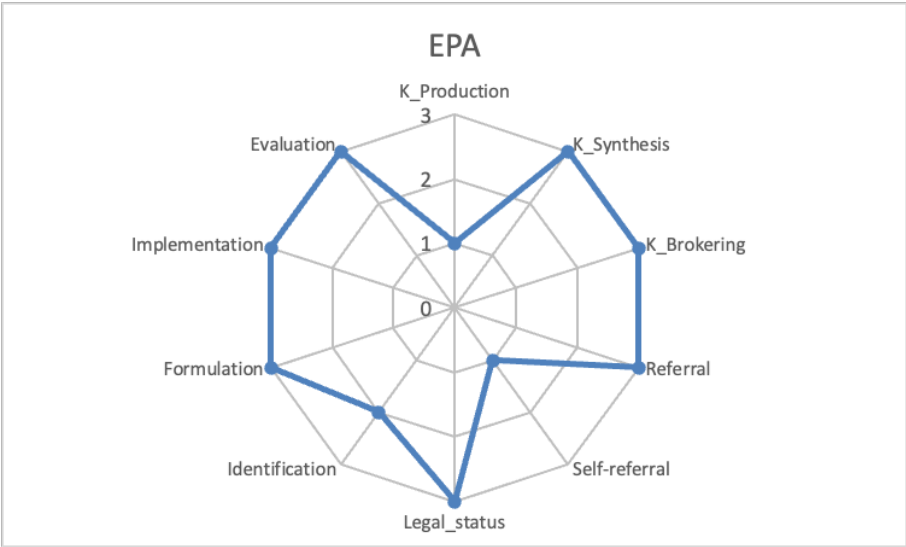
Source: produced by the author.

Overall, this is a very heterogeneous type of organisation on which little information is available, with the exception of the MNHN and the Gustave Eiffel University. For the universities and *Grandes Ecoles*, a dedicated survey could better shed light on their interaction with public policies at the institutional level.

2.4 Other public administrative institutions of the State and independent authorities

The organisation category of public administrative institutions (EPAs), as presented here, is very broad and includes heterogeneous bodies, which are essentially distinguished by the tasks entrusted to them by the State.

Figure 5. Characterisation of EPAs and their scientific advice for public policymaking

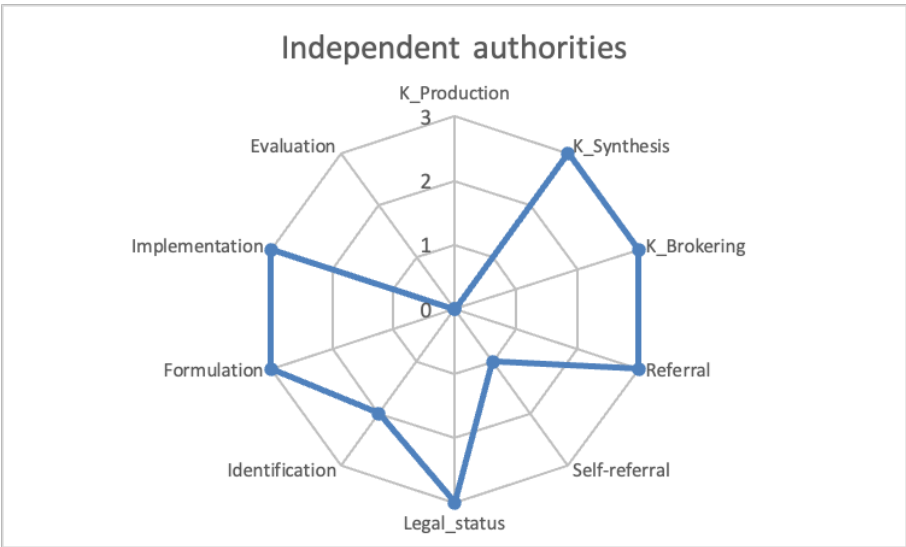


Source: produced by the author.

Examples of EPAs: the French Biodiversity Office (OFB), Water Agencies, French National Agency for Food, Environmental and Occupational Health and Safety (ANSES), Public Health France, National Agency for Territorial Cohesion (ANCT), the National Institute of Geographical and Forest Information (IGN), Météo France, the National Institute for Origin and Quality (INAO), France AgriMer (the National Establishment for Agricultural and Sea Products) the Coastal Protection Agency, the Nuclear Safety Authority (ASN).

Together with the components of the Ministries and OPECST, the State public institutions are at the heart of the knowledge brokering activity, due to their proximity to policymakers associated with their legal status. Brokerage is their core business, as these organisations are close to the government and interact with it on a regular basis. The roles of knowledge producer/synthesiser/broker can also be combined within the same organisation, as is the case with ANSES, which produces knowledge (with its laboratories), synthesises knowledge on certain subjects, brokers knowledge on others and is directly involved in decision-making (such as the marketing of pesticides, for which it issues authorisations). The agency is therefore involved in several stages of the public action life cycle, ranging from the identification of the problem (notably through its interaction with stakeholders) to formulation (through the synthesis it produces on specific topics) and implementation (e.g. through its role in the implementation of European regulations).

Figure 6. Characterisation of independent authorities and their scientific advice for public policymaking



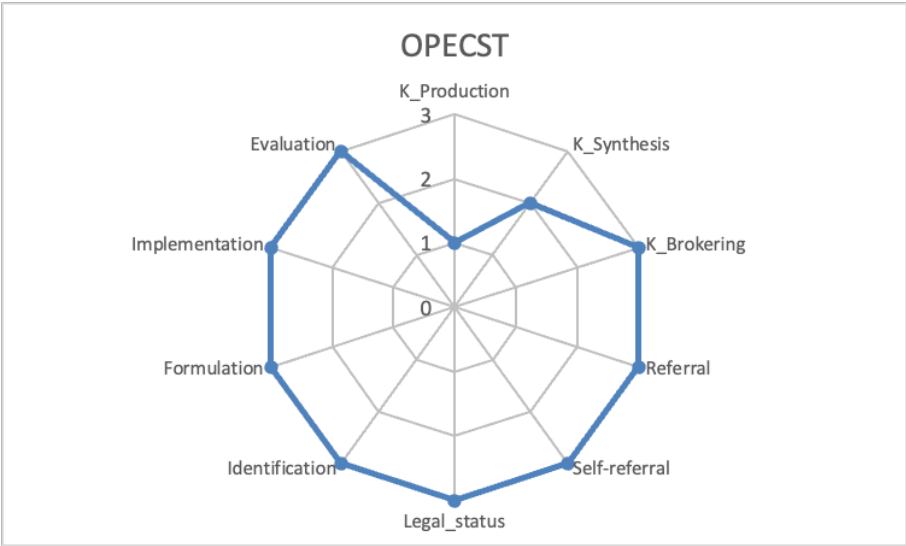
Source: produced by the author.

2.5 The Parliamentary Office for the Evaluation of Scientific and Technological Choices (OPECST)

Parliamentary delegations are permanent information and control bodies specialising in areas with cross-cutting issues. They provide parliamentarians with a capacity of expertise independent of the government and, since they are normally not directly involved in legislative work, independent of the legislative process.

The Parliamentary Office for the Evaluation of Scientific and Technological Choices (OPECST) is one of these delegations, and the Senate also has five other delegations. Set up in 1983, OPECST *'has the task of informing Parliament of the consequences of scientific and technological choices in order to inform its decisions. To this end, it gathers information, implements study programmes and carries out evaluations'*. Its members are appointed in such a way as to ensure proportional representation of the political groups, this delegation being common to both the National Assembly and the Senate. It is made up of 18 deputies and 18 senators. The matter may be referred to the Office either by the Bureau of either assembly (on its own initiative, at the request of a President of a political group, or at the request of 60 Members or 40 senators) or by a special or permanent committee. So far, the issues addressed have been divided more or less equally between four main themes: energy, the environment, new technologies and life sciences. A specific feature of the Office concerns the powers given by law to the Office's rapporteurs, which are identical to those of the budget rapporteurs. They can therefore carry out documentary and on-site inspections at all organisations under the authority of the State and obtain all service documents, with the exception of those concerning national defence or State security.

Figure 7. Characterisation of the OPECST and their scientific advice for public policymaking

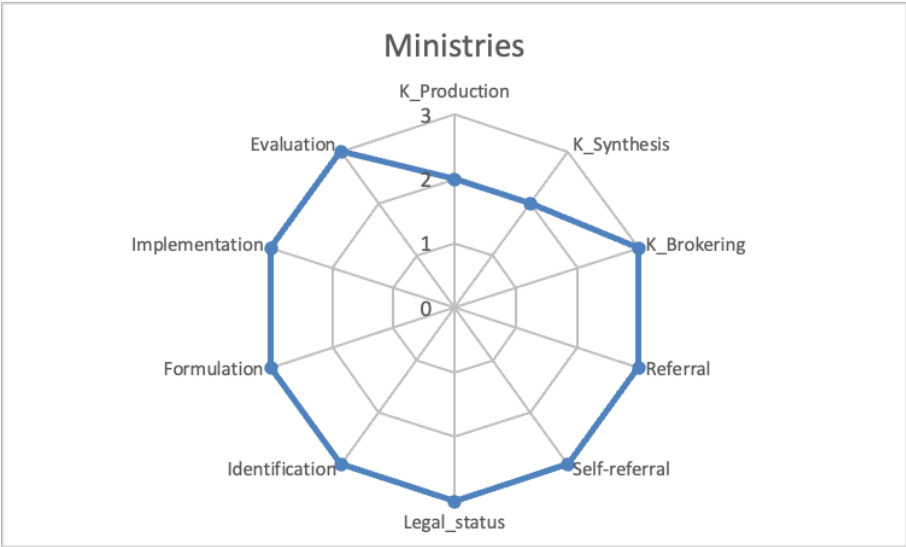


Source: produced by the author.

2.6 The Government Departments / Ministries

Compared with the other classes of the typology, this category is fairly homogeneous, consisting of departments or directorates of the Ministries concerned with the thematic areas identified in this report. While they hold a central place in the ecosystem, the understanding of their knowledge production, synthesis or brokerage practices remains limited and would greatly benefit from an in-depth investigation.

Figure 8. Characterisation of the Ministries and their scientific advice for public policymaking



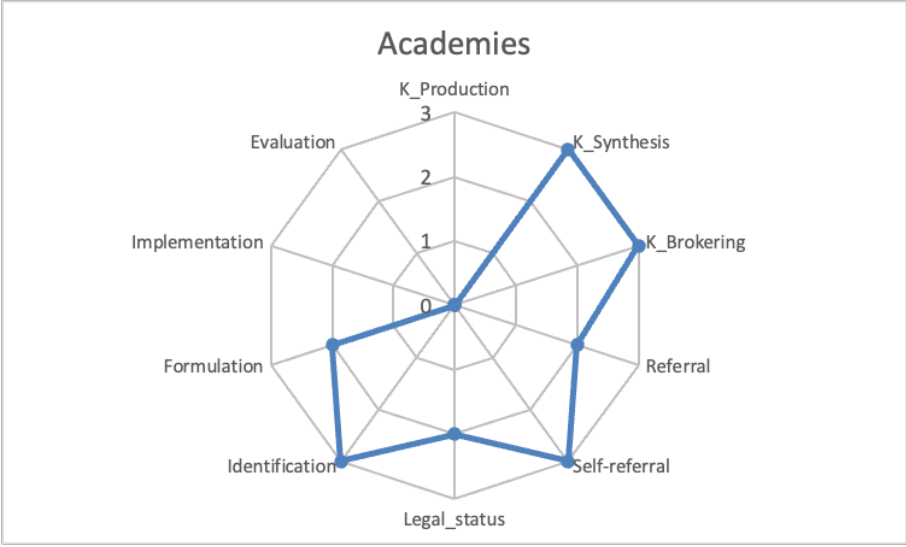
Source: produced by the author

Examples of structures in this category include the Directorate-General for Risk Prevention (DGPR), the Directorate-General for Planning, Housing and Nature (DGALN), the Directorate-General for Energy and the Climate (DGEC), the General Commission for Sustainable Development (CGDD), the General Council for the Environment and Sustainable Development (CGEDD), the Directorate General for Education and Research (DGER), the Directorate-General for Food (DGAL), the General Council for Food, Agriculture and Rural Areas (CGAAER).

2.7 The Academies

A very homogenous category, the Academies are a reference for scientific legitimacy in the ecosystem of science for policy. They play a role in accentuating certain societal questions, which they bring to political attention, sometimes in controversial situations.

Figure 9. Characterisation of the Academies and their scientific advice for public policymaking



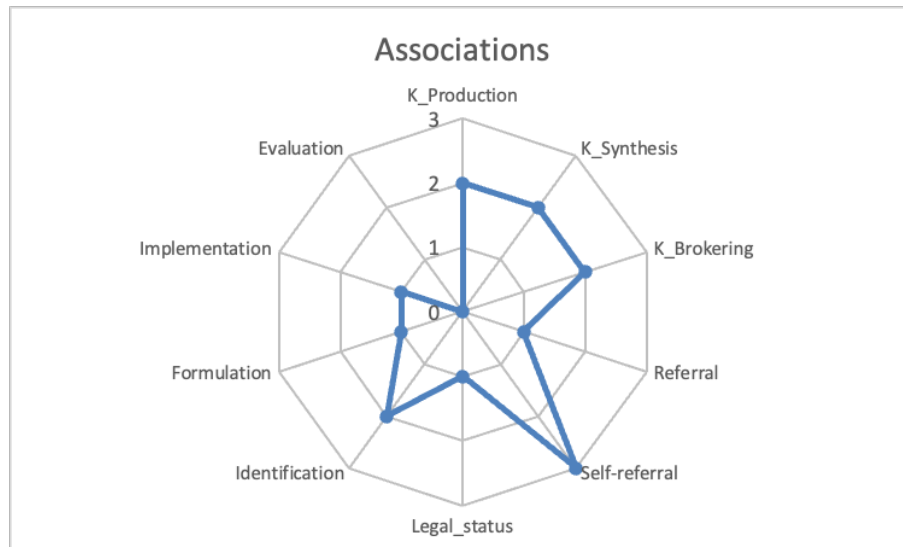
Source: produced by the author.

Three academies can be selected for the thematic areas investigated: the National Academy of Medicine, the Academy of Sciences and the Academy of Agriculture.

2.8 Associations under the 1901 Act with missions to support public authorities

This category is heterogeneous, with some of its organisations involved in drawing up standards (such as INRS – the French National Research and Safety Institute for the Prevention of Occupational Accidents and Diseases), while others aspire to the status of professional scientific and technical reference centre, such as ITSAP (Technical and Scientific Institute of Apiculture and Pollination).

Figure 10. Characterisation of Associations under the 1901 Act and their scientific advice for public policymaking



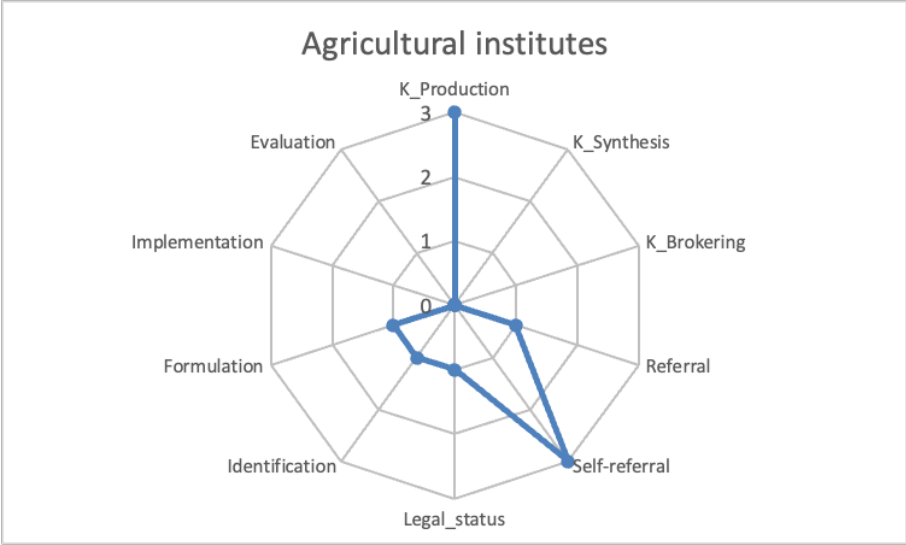
Source: produced by the author

The 1901 association status is legally characterised by the objective of non-profit activity, which makes these structures dependent on the method of financing agreed between the partners involved in their establishment. Unlike other structures in the ecosystem, 1901 associations do not have an administrative supervisory body (ministry etc.), although in some cases the State or local authorities may be involved as partners. Their financing may therefore be more volatile over time, and as a consequence also their activity.

2.9 Agricultural technical institutes

Agricultural Technical Institutes are organisations for applied research, technical support, experimentation, expertise, training and information, specialising in agricultural sectors. They come together under the umbrella of the Agricultural Technical Coordination Association (ACTA), and form this network recognised by the public authorities.

Figure 11. Characterisation of agricultural technical institutes and their scientific advice for public policymaking

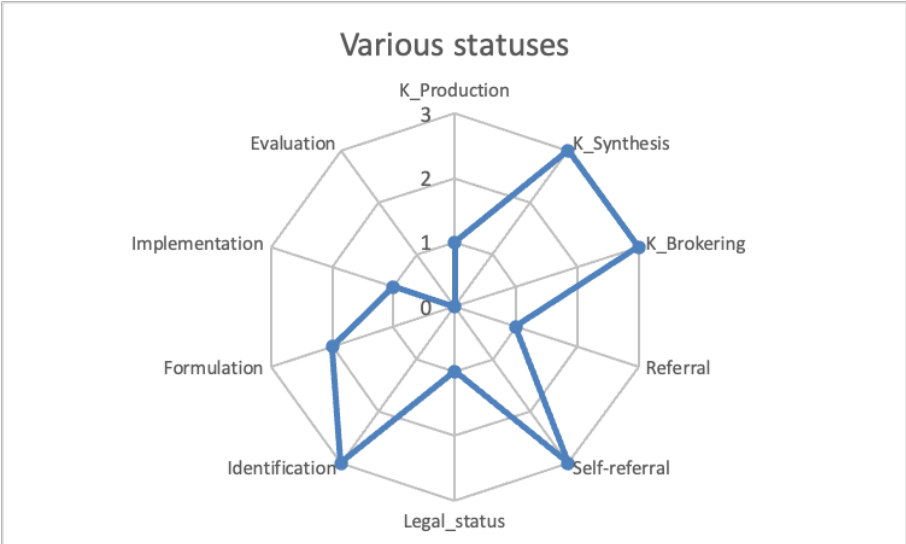


Source: produced by the author

2.10 Organisations with various statuses

This category includes public interest groups (e.g. the French Agency for Development and Promotion of Biological Agriculture), foundations for scientific cooperation under private law (e.g. the Foundation for Research on Biodiversity), Scientific Interest Grouping (e.g. the Central Laboratory for Monitoring the Air Quality), National Botanical Conservatories or networks with no particular legal status such as the Regional Groups of Climate Experts.

Figure 12. Characterisation of bodies with various status and their scientific advice for public policymaking



Source: produced by the author.

2.11 The expert committees working with the government and the ministries

A number of temporary expert groups advise the government, including

- the **France Stratégie** – an institution reporting to the Prime Minister, which ‘makes recommendations to the executive branch, organises debates, leads consultations and contributes to the ex-post evaluation of public policies’.

- the **Commission on the Economy of Sustainable Development (CEDD)**, whose task is to inform the formulation and evaluation of public policies in the fields of environment, energy and climate, transport and housing, in particular through the analysis of statistical data and the comparison of economic analyses.
- the **National Council for the Protection of Nature (CPCN)**, created in 2016, is a body of scientific and technical expertise, with competence in biodiversity protection and more specifically in the protection of species, habitats, geodiversity and ecosystems. It gives its opinion on draft legislative or regulatory texts relating to its areas of competence.

Figure 13. Characterisation of the Committees and their scientific advice for public policymaking



Source: produced by the author

2.12 Organisations which mobilise scientific knowledge on an ad hoc basis

This category includes **Senate committees**, which are working bodies specialising in the study of general or ad hoc problems, and the **standing committees of the National Assembly**.

Three other examples are the **National Committee for Biodiversity** – with an advisory role on biodiversity, the **National Council for the Ecological Transition** – environmental social dialogue body, and the **National Water Committee** – advising on water policies.

3 Science for policy in France: Challenges and opportunities

In this section, we identify a set of challenge and opportunities for science for policy in France.

3.1 Autonomy of scientific expertise and political power

In their international comparison of the responses to the COVID-19 pandemic, Giraud and Warin (2020) raised the question **of the autonomy of scientific expert knowledge vis-à-vis political power**, and thus their ability to alert the latter in the event of a problem. This can be reflected in three other questions, about mechanisms for formulating referrals, about monitoring mechanisms and about hierarchical relations.

At the heart of the first concern **is the way of constructing the questions to which the expertise must respond**. When expert committees are called upon to answer a question, this has often already been worked upstream by the bodies requesting expertise (ministries, agencies, etc.). The referral is binding on the experts and the degree to which the experts themselves discuss the terms of the referral varies, although in some cases there may be no discussion at all. Regardless of whether the experts consider the question to be appropriate to the problem to be solved, they have to answer it without necessarily being able to reformulate or amend it.

Scientific knowledge resides on a scale of audibility, ranging from inaudible – due to the distance between some scientists and the spheres of power – to the close proximity (dedicated agencies, ministries' departments), which essentially respond to the questions raised by ministries about public policies. The question that may arise is to what extent the latter inform the authorities on considerations that they themselves do not formulate. The mechanisms of expertise are built in France to meet the needs expressed by the political authorities, which may decide whether or not to open up the range of possible options to alternative questions, or to build a capacity to learn about issues that do not arise. The ecosystem is constructed in the form of a portfolio of organisations that can be mobilised according to the questions to be answered and the specific context of these questions, which can be characterised in terms of the resource of competence and legitimacy that the authority wishes to mobilise (whether technical, institutional or academic).

The second question is that of **scientific monitoring mechanisms**, the aim of which would be to bring scientific alerts on existing or new problems to the attention of decision-makers. This would include, for example, the participation of scientists in active bodies within ministries or agencies, regular interaction between representatives of research bodies and their supervisory authorities, scientific councils reporting to ministries or national agencies, or collaboration formalised by cooperation agreements between the latter and research laboratories. The question of the effectiveness of existing scientific monitoring mechanisms could be the subject of analysis.

A related question is that of the link between the legal status of the organisations and their capacity to influence decisions. In the case of an agency, its knowledge has immediate regulatory relevance, whereas academic research may or may not influence the 'business-as-usual' decision-making process. The question that deserves discussion is this: is the voice of an organisation more solicited and heard, the closer it is legally designed to be to the authorities in power? But also the corollary question: does an organisation have less autonomy in the responses it can provide and self-referral capacity, the closer it is to power? The closer it is legally to the authorities in power, the more its working procedures could also be influenced by the latter, and consequently the construction of the knowledge in response to the question asked?

Addressing the ecosystem through the lens of legal statuses raises the question of the **factors that determine the audibility of knowledge** that is not part of the sphere of immediate concerns of those in power, but which may be relevant to the governance of issues that concern French society. While the mechanisms of demand (political)-response (from a supplier of scientific knowledge) seem functional at first sight, and in line with the priorities of those in power, the mechanisms of reverse interaction, initiated by non-institutionalised knowledge producers seem much less clear-cut and of uncertain legal status.

In order to make itself heard, ignored knowledge can take alternative routes such as protest by NGOs or trade unions, the press, social networks, etc. What part do informal and regular exchanges within organisations at the science-policy interface, and between these organisations and the political authorities, play in feeding back information that is useful for decision-making? Overall, the question of knowledge that is (voluntarily or involuntarily) 'not demanded' (but potentially relevant) is one of the central issues in the organisation of the science for policy ecosystem.

Furthermore, the question of **legal status** may arise in relation to **the prioritisation of questions by the public authority**: is the temporary and relatively fragile legal status of associations under the 1901 Act,

foundations, scientific interest groups and public interest groups a sign of lesser interest in the issues dealt with by these bodies (biodiversity, organic farming, occupational health, etc.)?

3.2 The role of scientific knowledge in decision-making

Another major issue for the French ecosystem is **the role of scientific knowledge in decision-making** more generally. Does the political decision seriously include scientific knowledge in the decision-making equation, or is it essentially based on other criteria? This question goes hand in hand with another: is scientific knowledge willing to open itself up to questions from outside the academic community, including the decision-making sphere?

This characterisation of the French ecosystem has not been able to include some essential **components**, namely non-governmental organisations (NGOs), consultancy firms and private laboratories, think-tanks and other non-profit structures representing industry and journalists. These stakeholders play major roles in the science-policy interface, which have to be characterised, especially since **forms of discrepancy between the knowledge produced by these different components of the ecosystem and academic knowledge** regularly fuel controversies (e.g. tensions between academic knowledge and regulatory science – especially toxicology – produced by private laboratories or research firms on behalf of industry, in regulatory procedures).

3.3 The relationship between academic and other forms of expertise

The relationship between academic knowledge and knowledge produced by consultancy firms and private laboratories is particularly important, given the demand for these structures in the production of knowledge for decision-making. If we take the example of the regulatory science involved in placing, maintaining or withdrawing chemical substances from the market, almost all the dossiers submitted by European manufacturers to demand authorisation for certain uses of their substances under the European REACH regulation are drawn up by consultants. Similarly, toxicity studies submitted by manufacturers as part of regulatory marketing procedures are produced extensively by private laboratories. Although this type of knowledge does not come directly from the request of the public authority, it plays a central role in decision-making. And even if they are produced for European regulatory needs, the French authorities use them to fulfil their role in the European regulatory landscape. Recently, the report of the Committee of inquiry on the increasing influence of private consultants on public policies (2022) characterised this influence as ‘tentacular’ and questioned why decision-makers would prefer these private structures instead of public expertise, including public research. The report showed that one of the main criteria for prioritising consultants was the speed of their response, especially in crisis contexts that require strong and immediate political responses. Another of their advantages is the way in which the results are presented, which is adapted to the needs of the decision and even guides it: often in the form of scenarios, with their advantages and disadvantages, and even prioritised to highlight the ‘best’ option.

3.4 Coordination and communication between different components and actors of the French science-for-policy ecosystem

Another major challenge for the optimal functioning of the science-policy interface is related to **communication between the various structures responsible for the same field of action**. Regular information flows can allow not only better quality of knowledge provided in support of public policies, but also better consistency between knowledge inputs from different sources.

The French ecosystem is characterised by **an abundance of structures**, some of whose missions may appear similar (for example, on the issue of biodiversity or the energy performance of buildings). The existence of the ad hoc expert committees in addition to these structures raises the question of the reasons for the existence of these committees and of the overall performance of the already existing structures in response to political expectations. The tendency to add new structures at each crisis, often encompassing already existing structures, has already been noted (Commission des Affaires Sociales, 2011; Giraud and Warin, 2020). What are the reasons for this redundancy, and where does the public authority’s need to renew the structure of the ecosystem come from? It seems that, when dysfunction is revealed by a crisis, an ecosystem structure is created, often from one or more already existing structures – which subsequently disappear – in order to renew their mission under a new name that is better adapted to the terminology and the issues of the latest controversy.

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List of abbreviations and definitions

AASQA	Associations agréées de surveillance de la qualité de l'air (Approved air quality monitoring associations)
ACTA	Association de coordination technique agricole (Agricultural Technical Coordination Association)
ADEME	Agence de l'environnement et de la maîtrise de l'énergie (Environment and Energy Management Agency)
AFB	Agence française pour la biodiversité (French Agency for Biodiversity)
ANCT	Agence nationale de la cohésion des territoires (National Agency for Territorial Cohesion)
ANDRA	Agence de l'environnement et de la maîtrise de l'énergie (Environment and Energy Management Agency)
ANSES	Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail (French National Agency for Food, Environmental and Occupational Health and Safety)
ASN	Autorité de sûreté nucléaire (Nuclear Safety Authority)
BRGM	Bureau de recherches géologiques et minières (French Geological Survey)
CBN	Conservatoires botaniques nationaux (National Botanical Conservatories)
CBNP	Conservatoire botanique national du bassin parisien (National Botanical Conservatory of the Paris Basin)
CEA	Commissariat à l'énergie atomique et aux énergies alternatives (French Atomic Energy and Alternative Energies Commission)
CEDD	Commission de l'économie du développement durable (Commission on the Economy of Sustainable Development)
CEREMA	Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement (Centre for Studies and Expertise on Risks, the Environment, Mobility and Urban Planning)
CGAAER	Conseil général de l'alimentation, de l'agriculture et des espaces ruraux (General Council for Food, Agriculture and Rural Areas)
CGDD	Commissariat général au développement durable (General Commission for Sustainable Development)
CGEDD	Conseil général de l'environnement et du développement durable (General Council for the Environment and Sustainable Development)
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement (Agricultural Research Centre for International Development)
CNB	Comité national pour la biodiversité (National Committee for Biodiversity)
CNE	Comité national de l'eau (National Water Committee)
CNO	Comité national d'orientation (National Steering Committee)
CNOPSAV	Comité d'experts apicoles rattaché au Conseil national d'orientation de la politique sanitaire animale et végétale (Apiculture Expert Committee attached to the National Animal and Plant)
CNRS	Centre national de la recherche scientifique (National Centre for Scientific Research)
CNTE	Conseil national de la transition écologique (National Council for the Ecological Transition)

CPCN	Conseil national de la protection de la nature (National Council for the Protection of Nature)
CSPRT	Conseil supérieur de la prévention des risques technologiques (High Council for the Prevention of Technological Risks)
CSTB	Centre scientifique et technique du bâtiment (Scientific and Technical Centre for Building)
CTI	Consultance à titre individuel (Individual consultancy)
DAPP	Direction de l'appui aux politiques publiques (Directorate for Expertise and Support for Public Policies)
DEPE	Direction de l'expertise scientifique collective, de la prospective et des études (Directorate for Collective Scientific Expertise, Foresight and Studies)
DGAL	Direction générale de l'alimentation (Directorate-General for Food)
DGALN	Direction générale de l'aménagement, du logement et de la nature (Directorate-General for Planning, Housing and Nature)
DGEC	Direction générale de l'énergie et du climat (Directorate-General for Energy and the Climate)
DGER	Direction générale de l'enseignement et de la recherche (Directorate General for Education and Research)
DGPR	Direction générale de la prévention des risques (Directorate-General for Risk Prevention)
EC2I	Expertise et consultance institutionnelle (Expertise and consultancy services)
EHESP	École des hautes études en santé publique (School of Advanced Studies in Public Health)
ENGREF	École nationale du génie rural, des eaux et des forêts (National School of Rural Engineering, Water Resources and Forestry)
ENS	École normale supérieure
EP	Établissement public (public institution)
EPA	Établissements publics administratifs (public administrative institutions)
EPSCSP	Établissements publics à caractère scientifique, culturel et professionnel (public scientific, cultural or professional institutions)
EPIC	Établissements publics à caractère industriel et commercial (public industrial and commercial institutions)
EPST	Établissements publics à caractère scientifique et technologique (public scientific and technical research institutions)
ESCo	Expertises scientifiques collectives (Collective Scientific Expertise)
ESR	Enseignement supérieur et de recherche (Higher Education and Research)
FRB	Fondation pour la recherche sur la biodiversité (Foundation for Research on Biodiversity)
FREDON	Fédération nationale de lutte contre les organismes nuisibles (National Federation for the Control of Harmful Organisms)

GREC	Groupes régionaux d'experts climat (regional groups of climate experts)
HCC	Haut conseil pour le climat (High Council for Climate)
HCTISN	Haut Comité pour la transparence et l'information sur la sécurité nucléaire (High Committee for Transparency and Information on Nuclear Safety)
INSEE	Institut national de la statistique et des études économiques (National Institute of Statistics and Economic Studies)
IFSTTAR	Institut français des sciences et technologies des transports, de l'aménagement et des réseaux (Institute of Science and Technology for Transport, Development and Networks)
Ifremer	Institut français de recherche pour l'exploitation de la mer (French Research Institute for Exploitation of the Sea)
IGN	Institut national de l'information géographique et forestière (National Institute of Geographical and Forest Information)
INAO	Institut national de l'origine et de la qualité (National Institute for Origin and Quality)
Ineris	Institut national de l'environnement industriel et des risques (National Institute for Industrial Environment and Risks)
INRAE	Institut national de recherche pour l'agriculture, l'alimentation et l'environnement (National Research Institute for Agriculture, Food and the Environment)
INRS	Institut national de recherche et de sécurité pour la prévention des accidents du travail et des maladies professionnelles (National Research and Safety Institute for the Prevention of)
INSERM	Institut national de la santé et de la recherche médicale (National Institute of Health and Medical Research)
IRD	Institut de recherche pour le développement (National Research Institute for Sustainable Development)
IRSN	Institut de radioprotection et de sûreté nucléaire (Institute for Radiation Protection and Nuclear Safety)
ITAB	Institut de l'agriculture et de l'alimentation biologiques (Institute for Organic Agriculture and Food)
ITSAP	Institut technique et scientifique de l'apiculture et de la pollinisation (Technical and Scientific Institute of Apiculture and Pollination)
LCSQA	Laboratoire central de surveillance de la qualité de l'air (Central Air Quality Monitoring Laboratory)
MCTRCT	Ministère de la Cohésion des territoires et des Relations avec les collectivités territoriales (Ministry of Territorial Cohesion and Relations with Local Authorities)
MNHN	Muséum national d'Histoire naturelle (Natural History Museum)
MPES	Mission pour l'expertise scientifique (Mission for Scientific Expertise)
MTE	Ministère de la Transition écologique (Ministry of Ecological Transition)
ODD	Objectifs de développement durable (Sustainable Development Goals)
OFB	Office français de la biodiversité (French Biodiversity Office)
OPECST	Office parlementaire d'évaluation des choix scientifiques et technologiques (Parliamentary Office for the Evaluation of Scientific and Technological Choices)

OQAI	Observatoire de la qualité de l'air intérieur (Internal Air Quality Observatory)
OQALI	Observatoire de la qualité de l'alimentation (Food Quality Observatory)
PAC	Politique agricole commune (Common Agricultural Policy)
PCAET	(Plan climat-air-énergie territorial) Climate-Air-Territorial Energy Plan
PSPC	Les plans de surveillance et de contrôle (surveillance and control plans)
SNBC	Stratégie nationale bas-carbone (National Low-Carbon Strategy)
SNRE	Stratégie nationale de la recherche énergétique (National Strategy for Energy Research)
UPEM	Université Paris-Est Marne-la-Vallée (University of Paris-Est Marne-la-Vallée)
UGE	Université Gustave-Eiffel (Gustave Eiffel University)

List of figures

Figure 1. Characterisation of EPSTs and their scientific advice for public policy.....9

Figure 2. Characterisation of EPICs and their ‘Research’ and ‘Data’ profiles..... 10

Figure 3. Characterisation of the MNHN and their scientific advice for public policymaking..... 11

Figure 4. Characterisation of the *Grandes Ecoles* and their scientific advice for public policymaking 12

Figure 5. Characterisation of EPAs and their scientific advice for public policymaking..... 13

Figure 6. Characterisation of independent authorities and their scientific advice for public policymaking..... 13

Figure 7. Characterisation of the OPECST and their scientific advice for public policymaking 14

Figure 8. Characterisation of the Ministries and their scientific advice for public policymaking 15

Figure 9. Characterisation of the Academies and their scientific advice for public policymaking 15

Figure 10. Characterisation of Associations under the 1901 Act and their scientific advice for public policymaking 16

Figure 11. Characterisation of agricultural technical institutes and their scientific advice for public policymaking 17

Figure 12. Characterisation of bodies with various status and their scientific advice for public policymaking. 17

Figure 13. Characterisation of the Committees and their scientific advice for public policymaking..... 18

List of tables

Table 1. Categories of organisations and their functions for the science-public policy relationship.....8

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