



ARTICLE

Received 7 Jan 2016 | Accepted 11 May 2016 | Published 7 Jun 2016

DOI: 10.1057/palcomms.2016.29

OPEN

Revealing a paradox in scientific advice to governments: the struggle between modernist and reflexive logics within the PBL Netherlands Environmental Assessment Agency

Eva-Maria Kunseler^{1,2}

ABSTRACT While governmental scientific advisers attempt to innovate their practices to become more reflexive and interactive, they cannot escape the modernist fundaments that constitute these practices. How do governmental scientific advisers make sense of this paradoxical situation? Using the transition process in the PBL Netherlands Environmental Assessment Agency as a paradigmatic case, this article explores how four actor groups—the PBL management team, clients, PBL practitioners and external peers—involved in PBL’s transition process disclose their views on institutional redesign and, while doing that, express their beliefs on what they think scientific advice “is” and “should do”. Frame analysis identifies three coexisting frames of PBL’s (future) role and identity—PBL as integrated assessment specialist, PBL as think tank and PBL as trustworthy expert. Implicated in these frames are reflexive beliefs in a “professional culture of humility” that seem to replace the modernist “science speaking truth to power” mode of advising in the PBL organization. At the same time modernist beliefs in the science/politics demarcation, objectivity and scientific privilege persist, in part by revisiting them in view of the newly found reflexive principles of humility, transparency and deliberation. In conclusion, this empirical work illustrates how questioning and deliberating about the role and identity of one’s own organization is the first step to advance institutional redesign in scientific advice to governments. The challenge for governmental science advisers is to “translate” processes of institutional redesign into concrete social and cultural changes, bringing about a transformation in conceptions of what scientific advice is and should do all along. This article is published as part of a thematic collection on scientific advice to governments.

¹ PBL Netherlands Environmental Assessment Agency, The Hague, The Netherlands ² Institute for Environmental Studies, VU University Amsterdam, Amsterdam, The Netherlands Correspondence: (e-mail: eva.kunseler@pbl.nl)

Introduction

Within a relatively short time span of approximately 50 years, we have witnessed the establishment of scientific advice to governments on a large scale and, at the same time, a fundamental change in the concepts of science and governance going hand in hand with the democratic and deliberative turns in science and politics. The “self-evident” authority of scientific advisers has come under scrutiny by public scepticism towards the wisdom and honesty of experts and the massive reliance on expert knowledge as a foundation for policy (Bijker *et al.*, 2009; Lentsch and Weingart, 2011). In spite of the loss of authority on the part of experts, and, thus, of their legitimating value, somewhat paradoxically, the modernist arrangements for scientific advice to governments remain steadily in place. Modernist beliefs in objective science and scientific autonomy assure the impression of demarcation between the worlds of science and politics, this way (ideally) avoiding the scientization of politics or politicization of science to occur (Weingart, 1999). Highly institutionalized forms of expertise construction such as the IPCC (Intergovernmental Panel on Climate Change) and IPBES (Intergovernmental Platform on Biodiversity and Ecosystem Services) are cases in point. At the same time, the growing intertwining of science and society (Hajer and Wagenaar, 2003; Irwin and Michael, 2003; Maasen and Weingart, 2005) bring about shifts in the conception of what scientific advice “is” and “should do”, triggered by ever more knowledge controversies over objects of governance (Hajer, 2009) and growing difficulties of containing “scientific” issues within established institutional boundaries (Gottweis and Braun, 2007). We witness the emergence of a range of new ideas and approaches for how to shape and institutionalize science/society interactions in a more interactive and reflexive way in many countries, inspired by notions of “citizen science” and “co-creation” defining and redefining roles of citizens, politics and science in resolving societal problems in interaction with the social and political context under study (Irwin, 1995; Fischer, 2000; Maasen and Weingart, 2005; Fischer, 2009). It is assumed that the reorganization of governmental scientific advising along the lines proposed by reflexive scholars will increase the accountability, quality, effectiveness and legitimacy of scientific expertise in society (Funtowicz and Ravetz, 1993; Nowotny *et al.*, 2001; Jasanoff, 2003).

Attempts to replace the modernist logic with a reflexive one are not just difficult, but seen as subversive for the knowledge–power nexus implicated in institutionalized forms of scientific advice to governments (Foucault, 1995). Governments in the modern era have sought to exercise their powers of regulation and control through knowledge regimes (Scott, 1999) that use “value-free” scientific knowledge to “constitute what in effect become truth regimes just as much as governance regimes” (cf. Turnhout *et al.*, 2016). This is not the place to explore the question of why or exactly how the knowledge–power nexus is constituted in scientific advice to governments. Yet, this situation is telling of the paradox governmental science advisers are confronted with: while they attempt to innovate their practices to become more reflexive and interactive, they cannot “escape” the modernist fundaments that constitute their practices.

This article explores how actors involved in governmental scientific advising make sense of this paradoxical situation. Using the transition process within the PBL Netherlands Environmental Assessment Agency as a paradigmatic case (Flyvbjerg, 2006), I shed light on the dynamics of institutional redesign. In so doing, I address a broader topic of relevance to this thematic collection on scientific advice to governments: What can an empirical study of a single expert organization in transition tell us about the future for scientific advice to governments?

Background

The science systems and knowledge infrastructures in many countries are modelled to modernist ideals of science speaking “value-free” truth to political power that gained institutional currency in the nineteenth century. The notion of value-free science itself was based on the expectation that the impartiality and objectivity of scientists could help overcome political conflict (Proctor, 1991). While, on the one hand, these modernist beliefs and arrangements are problematized or considered unacceptable after the deliberative and democratic turns in science and politics, on the other hand, they are strongly institutionalized in knowledge–power nexuses (Stirling, 2006; Wesselink and Hoppe, 2011) that help determine who is responsible, who has authority over whom and what sort of accountability is to be expected (Gottweis and Braun, 2007). It is through the mutual reinforcement of modernist beliefs, arrangements and approaches that the hegemony of the modernist logic in scientific advice to governments can be explained. The modernist logic is reflected in the institutional design of governmental expert agencies, marked by: a statutory status; an independent performance, that is, “unbiased experts” who are free from external influences, particularly from their clients; a scientific approach supported with elaborated scientific working procedures to assure “good science” and a mandate in advising the legislative or the executive (or both), that is, the government or government departments, on science-related policy issues (Jasanoff, 2005; Lentsch and Weingart, 2011).

The paradox that accompanies efforts of institutional redesign towards a reflexive mode of scientific advice to governments all along is that it occurs partially. Reflexive approaches may emerge while modernist beliefs, for example, in an objective and independent advice, remain uncontested as part of the knowledge–power nexus constituting modernist arrangements in scientific advice to governments. Exemplary are the reform attempts at IPCC: “the negotiations over IPCC reform have thus far focused on improving scientific quality by revisiting specific procedures (from the selection of authors and review procedures to the way errors are dealt with in published assessment reports) ... [while] ... So far, no debate has ever taken place about the IPCC’s relationship to public policy and to its various global ‘publics’ or about its normative commitments in terms of accountability, political representation, and legitimacy” (cf. Beck *et al.*, 2014). Even when reflexive principles are mobilized, they seem not to replace but to “add on” to modernist ideals. A prime example is that leading practitioners of scientific advice signalled the need for embedding principles of humility, transparency and honest brokerage in the practice of scientific advice to governments. They drafted principles for a twenty-first century science advisory practice that is legitimate and accountable (Gluckman, 2014; ICSU, 2014); yet the simultaneous inclusion of autonomy and scientific privilege in the set of principles illustrates that the “traditional” modernist ideal of science speaking “value-free” truth to political power is still very much alive.

At the same time, these examples illustrate how practitioners seek room for manoeuvre and options available for reforming scientific advice to governments. A review of literature on expert roles reveals that scholars emphasize on transparency in methods and assumptions, a professional attitude of humility, public participation and democratizing science and explication of different points of view (Spruijt *et al.*, 2014), this way endorsing a reflexive logic of what scientific advice “is” and “should do”. In recognizing the limits of prediction and control, scientific advisers come to grips with different meanings and functions of knowledges in different contexts. Experts are compelled to open up to wider review and make “engaged publics” integral to

their practices. They essentially need, using a phrase of Jasanoff (2003), to institutionalize “technologies of humility”, involving participation, reflexivity, framing and transparency to address the partiality of scientific knowledge and the inevitable uncertainty and ambiguity it holds. New roles of science in society, such as honest brokering (Pielke, 2007), enable experts to facilitate interaction with societal actors to address societal problems marked by uncertainty and ambiguity. The spectrum of possibilities in which new roles for science emerge characterizes the dynamic character of reform attempts, but also leads to a lack of understanding of those new roles and a lack of distinction between them (Turnhout *et al.*, 2013; Reinecke, 2015). New roles for science may even end up reinforcing a traditional modernist logic of scientific advising, while “hiding this reality with an attractive label and a new-found legitimacy” (cf. Turnhout *et al.*, 2013). Illustrative hereof is an example pertaining to the context of PBL, my case setting. In February 2010, PBL was assigned the task by the Dutch cabinet and parliament to review the IPCC fourth assessment report (AR4) in response to political and media debate about mistakes in the regional assessment part. PBL’s former Director (from 2008 to 2015) Maarten Hajer, a renowned scholar in deliberative governance, initiated a deliberative repertoire (Hajer, 2012) by inviting critical peers and publics to contribute to the review of potential mistakes (PBL, 2010). While this reflexive and interactive approach restored the credibility and legitimacy of PBL and climate science in general (Hajer, 2012; Tuinstra and Hajer, 2014), the encapsulation of the extended peers within the institutionalized setting of PBL resulted in an inevitable technocratization of their participation (Metze and Turnhout, 2014; Tuinstra and Hajer, 2014). The deliberative repertoire was also perceived to undermine the epistemic authority of climate science. Others found it risky since PBL positioned itself in political debate by engaging with climate sceptics and lay people (Tuinstra and Hajer, 2014). This case example clearly reveals the paradox PBL finds itself in: steps in the direction of a reflexive mode of advising are not undisputedly accepted.

Case introduction and research approach

This article zooms in on the transition process in one of the government-funded Dutch *planning bureaux*¹: the PBL Netherlands Environmental Assessment Agency (in Dutch: *Planbureau voor de Leefomgeving*; further abbreviated to PBL). I use this setting as a paradigmatic case (Flyvbjerg, 2006) in the hope of learning something about the belief systems of actors who acknowledge the need for institutional redesign, yet are constituted in the knowledge–power nexus implicated in scientific advice to governments. Given that the debate over the roles and identities of expert bodies in the science–policy interface is as lively in the Netherlands as anywhere else (Halffman, 2005; Halffman and Hoppe, 2005) and given PBL’s active attempts to move into the direction of a reflexive mode of advising, an empirical study of the transition process within the PBL may illustratively unmask how processes of institutional redesign take shape. The PBL dates back to the mid-1990s and in its present form was established in 2008 out of a merger of the MNP Netherlands Environmental Assessment Agency and the RPB Netherlands Institute for Spatial Research. The PBL advises the Dutch government in policy areas of nature, spatial planning and the environment with independent² policy analysis studies.

Triggered by a credibility scandal in 1999, the PBL unwittingly embarked on a transition from a technocratic mode to a more reflexive mode of advising (Petersen *et al.*, 2011); yet in so doing it was confronted with the paradoxical situation described above. The

PBL has attempted to innovate its practices to become more reflexive and interactive, yet cannot “escape” the modernist fundaments constituting its practices: “.. given the institutionalized role of the Netherlands Environmental Assessment Agency at the Dutch science–policy interface and regular reorganizations (the latest due to a merger), the modest progress made in the direction of a PNS [post-normal science³] strategy should be considered a substantial result. It is not clear how much further the agency could go even, without losing some of its credibility in the policy domain (based on the image of ‘normal science’)” (cf. Petersen *et al.*, 2011). PBL practitioners acknowledge the added value of stakeholder participation, for instance, but are in doubt about the quality impact this may have (Kunseler *et al.*, 2015). They pragmatically pursue a strategy of bridging innovative ambitions with institutionalized practices; and in this way attempt to work effectively under the coexistence of modernist and reflexive ideals within the organization (Kunseler and Vasileiadou, accepted for publication).

While offering rich insight into the paradoxical situation at PBL, previous case work remains short of insight into the belief systems of actors involved in PBL’s transition process. This article explores how four crucial actor groups—the PBL management team, PBL practitioners, clients and external peers—make sense of the paradoxical situation, and while doing that express their beliefs on what they think scientific advice “is” and “should do”. I approach this task using frame analysis, which serves as an analytical tool that gives insight into sense-making⁴ processes in organizations that face challenges and surprises (Termeer and van den Brink, 2013). Weick (1995) considers sense-making as the root activity of people who have to deal with an unpredictable and unknowable world. Frame analysis is a language-focused method that identifies how groups of actors structure their views through active processes of problem structuring and interpretation to make their world logical and meaningful, sometimes pointing to the implications for action of their ways of thinking (Yanow, 2003). Different actors may problematize different situations, tell different stories and suggest different solutions. These processes may lead to frame differences, which represent a rich variety of perspectives, interpretations and ways of understanding what is going on (Laws and Rein, 2003). An analysis of frames among four actor groups, as I pursue with the PBL case in the next sections, is therefore potentially illustrative of the plurality of and interrelations between their beliefs on what they think scientific advice “is” and “should do”. These four actor groups are situated within the knowledge–power nexus constituting the PBL organization. For the purpose of frame analysis, I draw on documented material of strategic events in the period from 2008 to 2015 in which actor groups reflected on PBL’s (future) identity and role. Table 1 summarizes my data sources for frame analysis for each of the four actor groups. Actors draw on own experiences or refer to exemplary studies of PBL to mark their point of view. Although I separate the actor groups for the purpose of identifying frame differences, in practice they interact more or less frequently in daily work implying that their views on the identity and roles of PBL have been dynamically shaped within these interaction processes as well.

Using qualitative analysis software I systematically coded the data reflecting actor expressions on three attributes: (1) the crucial drivers for the transition process within PBL; (2) the desirable role/identity of PBL; and (3) the methodological, cultural and regulatory challenges accompanying the transition process. In conducting qualitative content analysis of these sources, first-order coding served to identify patterns across actor expressions about 1, 2 and 3, resulting in three “frames” that are summarized in Table 2 and described in the next section. Second-order coding served to identify

Table 1 | Data resources for qualitative content analysis

<i>PBL practitioners</i>	<i>PBL management team</i>	<i>Clients PBL</i>	<i>External peers</i>
Nine session reports and a summary report of a PBL seminar on expert roles on 18 January 2011	PBL's strategic plan: the charcoal sketch (November 2011), implementation plans of PBL's departments (June 2012) and progress reports (2013–2015)	16 interview reports and a summary report of a client satisfaction survey conducted in Autumn 2012. For details, see de Wit and Merx (2014)	Scientific audit report (PBL Audit Committee, 2013) and PBL's response to the audit committee (PBL, 2013b)
PBL practitioners reflected upon dilemmas they encounter in their daily practices during a seminar on expert roles. The seminar was organized under the heading of PBL's strategic programme on open assessment methodology	PBL's strategic plan was drafted in Autumn 2011 by the PBL management team. It describes ambitions and goals for PBL's role and position in 2015. Activities needed to achieve them in the period from 2011 to 2015 are formulated in implementation plans. The progress reports summarize PBL's achievement towards its self-defined ambitions and goals	The client satisfaction survey was conducted by PBL's counsellor in 16 semi-structured interviews with policy clients at various governmental departments, collaboration partners at universities and knowledge institutes, media and a societal organization. The survey was conducted as part of a self-evaluation study that was conducted in precedence to the scientific audit	An international scientific audit committee evaluated the scientific quality and societal relevance of research that is conducted by PBL. The audit covers the period from May 2008 to May 2012; with a focus on research conducted in 2011 and 2012. The committee made recommendations with regard to research improvements, relevance, PBL management and PBL's positioning in the future

Table 2 | Overview of frames and frame attributes

<i>Frame attributes</i>	<i>Frame 1: PBL as integrated assessment specialist</i>	<i>Frame 2: PBL as think tank</i>	<i>Frame 3: PBL as trustworthy expert</i>
(1) Crucial driver for transition	Increasing complexity of policy problems: multi-scale/multi-level	Mediatized society politicizes policy problems and expert knowledge	Public trust in experts decreases
(2) Role/identity of PBL	PBL assesses problems across scales, levels, themes and sectors	PBL puts perspective in debates on unstructured policy problems	PBL ensures trustworthiness and transparency of its assessment processes
(3a) Regulatory challenge	Working for multiple clients at various policy levels	Ensure policy relevance and credibility of think tank role	Standardized review procedures required
(3b) Cultural challenge	Interdisciplinary collaboration needs improvement	Need for reflection upon own/organizational assumptions as to account for normative bias	Acknowledgement of the importance of critical review
(3c) Methodological challenge	Assure quality of expertise for integrated assessment: governance expertise in addition to modelling expertise	Assure quality of expertise for perspective assessments: facilitation and interaction/communication skills	Develop a systematic approach for extended peer-review processes

beliefs within these frames on what actors think scientific advice “is” and “should do”; findings are discussed in the subsequent section.

As I am involved in producing the very objects under study, being a PBL practitioner myself, I am accordingly engaged in the transition process, and there is a blurred distinction between my analysis of the transition process and the practising of the transition itself. Coding, however, serves as a systematic method to develop a nuanced view and generate a comprehensive picture of the situation under study, whereas experience and proximity to the studied reality are at the very heart of case study research (Flyvbjerg, 2006) and help to gain insight into the contingent and partial processes of organizational change and innovation (Pallett and Chilvers, 2014).

Three coexisting frames

The findings of frame analysis can best be summarized as an experience of uncertainty and doubt about the future roles and position of PBL as government-funded expert agency. The four actor groups tell multiple stories; presented as three frames in the following paragraphs, revealing coexisting ideas about PBL’s role and identity. They highlight regulatory, cultural and methodological challenges when they structure and define the transition within PBL in view of what they recognize as the crucial driver for changing or strengthening a desirable role or identity. An overview of the three frames and their attributes is given in Table 2.

Frame 1: PBL as integrated assessment specialist

To provide relevant policy advice in today’s society where all problems are interlinked, PBL’s strength resides in its integrating approach: “Such an approach aims to inform policy-makers about all the relevant aspects and trade-offs and provides some warrant against suboptimal decision making” (excerpt from PBL’s Strategic Plan). The frame of PBL as specialist in integrated studies is promoted by the management team in view of PBL’s reputation; the long-standing national and international reputation of—in particular—the environmental section of the agency for its renowned integrated modelling studies on air pollution and climate change. Clients appreciate the facts and figures within PBL’s assessment studies, as “we can use them to underline towards governance and politics that much work is still needed” (excerpt from interview with societal organization). The biannual statutory PBL study titled “Assessment of the Human Environment”⁵ (or “Balance study” in short referencing) is frequently mentioned as key product. One policy client remarks, for example, that she brings the Balance studies to political debates, “for example about particulate matter, as it contains a surprising state of the art overview. Politicians cite these numbers as well” (excerpt from interview with policy client).

Due to increasing interrelatedness across themes, sectors, geographical scales and policy levels, actors across the four groups argue that PBL has to strengthen its ability to produce integrated studies. A collaboration partner highlights that PBL publications offer much information but sometimes lack profound analysis “which you require to understand how you get from one situation to another” (excerpt from interview with collaboration partner). The desirable identity that emerges within this frame is reflected in actor expressions that highlight the need for PBL to rethink problems as multi-scale problems. Although PBL already carries out studies on all scale levels, for example, with respect to climate change, energy or quality of living, actors point out that interrelatedness of these studies needs attention as well as inclusion of other domains like mobility, water, housing.

The methodological challenge, accordingly highlighted by the management team and external peers is to strengthen the

availability of expertise that enables PBL to conduct integrated analyses. In the past, integrative work has focused on environmental impact assessments to identify physical impacts, for example, emission reductions, of synergies and trade-offs across themes and sectors such as transport, energy, land use and so on. Yet, to improve the policy relevance of this work under increasing complexity of governance systems, additional attention to policy implementation processes is a must: “Sustainability issues can only be tackled when we understand the roles of different institutes (including markets) and their changing behaviour” (excerpt from PBL’s Strategic Plan). Other methodological issues associated with this task are the availability of resources (governance expertise and capacity in particular), the validity of regional data and the knowledge integration challenge of linking quantitative model-based assessments at multiple scales with qualitative case studies explaining regional or local impacts.

To accommodate the integrated assessment frame within the organization, the cultural challenge highlighted by external peers is to encourage more vigorous cross-fertilization among staff working on similar issues at international, national, regional and local levels. Several policy clients and collaboration partners underscore this challenge as they experience different voices across PBL and lack of contacts throughout the agency.

A regulatory challenge, highlighted under this frame, is to be aware of potential conflicts that may arise when doing studies involving different or multiple policy levels. Conflicts might arise, for instance, in relation to confidentiality of research results; or if analyses of related issues for different clients arrive at different conclusions; or if a conclusion meets ready acceptance at one level and resistance at another. While the management team seeks options for establishing client relationships with European, regional and local levels, without neglecting the national policy level as to avoid these conflicts, external peers suggest conflicts are to be avoided by ensuring consistency in recommendations across policy levels. PBL practitioners bring forward knowledge-sharing as an alternative to vertical client–supplier relationships, especially at lower policy levels, involving policymakers as stakeholders to coproduce the assessment. Policy clients remark that PBL should anyhow strengthen its institutional position in topic areas of spatial planning, housing—topics that are typically of decentralized nature—while collaboration partners point out that PBL has to consciously position itself to other research institutes in these areas as “stage manager” to ensure its legitimacy as a specialist in integrated assessment studies.

Frame 2: PBL as think tank

Another frame identifies PBL’s strength in its role of think tank where PBL not only produces policy analyses, but also aims to identify new policy perspectives expressed into politically relevant messages. Clients emphasize the visionary value of PBL’s trend studies, in particular the “energetic society”⁶ and foresight studies, the “nature outlook”⁷ in particular. In reflecting upon PBL’s role and identity, they point to agenda-setting as PBL’s core business and future development direction. Policy clients particularly appreciate this kind of analysis for its ability to make them think in new and productive ways: “In the energetic society study, PBL challenges policy makers to think in a more strategic way about government–society relations” (excerpt from interview with policy client). This role would, for example, imply, they suggest, that PBL’s work programme has to centre on “big” transition questions and its implications for policy, rather than being inclusive of policy issues and departmental requests as it tends to be.

This frame is justified in perspective of today’s mediatized society, where PBL’s role would be to reveal new action perspectives underpinned by scientifically sound and independent

(that is, not partisan to a specific normative or political position) analysis. PBL management embeds this frame within its mandate, arguing that stopping the analysis at “what” questions—as PBL used to focus on—leave policymakers with an important gap regarding “how” to achieve policy objectives. Collaboration partners bring in another argument when they remark that PBL in its think tank role most clearly distinguishes itself from other research institutes and universities. One partner remarks that “a profile as exclusive think tank would strengthen PBL’s position in the science–policy interface as it gives PBL a clear identity among other expert organizations” (excerpt from interview with collaboration partner).

There is doubt among PBL practitioners regarding the “appropriateness” of this role; some argue that PBL conveys an opinion with essay-like products and see this role as a normative positioning. They raise regulatory concerns with respect to the policy relevance of this role: “we may complicate policy matters by exploring policy problems in width instead of offering a clear yes/no response to a policy question” (excerpt from role seminar notes). Moreover, they feel that the credibility of PBL may be challenged if it advises policymakers and evaluates the same policy process later on. Can PBL still conduct an independent policy evaluation? For example, during the role seminar it is discussed how “performing different roles than expected as ‘standard’ may result in lack of clarity about the mission of PBL as a consequence of which PBL may run the risk of being perceived as ‘a chameleon who is mistrusted’” (excerpt from role seminar notes). Hence, there are many concerns about the regulatory status of this frame; Is PBL allowed to act as think tank? Another regulatory concern is that PBL in this role would increasingly depend on other research institutes for supply of research findings, while budgetary constraints in the research world do not ensure future supply is possible.

Another feeling of doubt among some PBL practitioners is of methodological nature and relates to the way to conduct this role: “we may not exactly know what this role is about” (excerpt from role seminar notes). Prioritizing unstructured⁸ issues means addressing potentially controversial issues: “This requires two-way communication about the basis of competing viewpoints” (excerpt from audit report). Accordingly, PBL researchers feel that they should address value orientations and action-oriented motivations, and affiliate themselves with a role of “post-normal researcher”⁹ (excerpt from role seminar notes). Knowing how best to factor interactive engagement with stakeholders and the public is crucial. External peers remark, however, that PBL still lacks the resources and means to engage consistently in stakeholder participation. It should invest particularly in a deliberative set-up of the assessment process, using innovative interactive techniques such as playing with models in a context of decision-making. Also facilitation skills and expertise in governance analysis need attention.

A cultural challenge in this respect, identified by external peers, is that despite broad openness to the idea of stakeholder participation across PBL, there is a lack of basic understanding of the latest scholarship on science–policy–society interactions: “many of which [i.e. core beliefs of PBL researchers] are still subscribed to the notion of ‘speaking truth to power’ without them seeming to realize that policy framings are always normative, and that independence in the case of PBL may involve taking into account the beliefs of different societal stakeholders—even those regarded as marginal by some scientists” (excerpt from audit report). Following the latest body of thought, they argue, PBL has to re-examine its own assumptions as what independence and policy relevance “mean” in this regard. To legitimately add perspective to political debates in a role as think tank, PBL’s commitment to its independence has to ensure

that PBL is not partisan to a specific normative or political position.

Frame 3: PBL as trustworthy expert

Even though the number of contested PBL studies is low,¹⁰ it is essential for PBL to avoid contestation and assure public trust in PBL’s expertise. This motivation underpins the third frame, identifying PBL’s strength in its qualified and trustworthy expertise organization. In view of this frame, PBL has to accommodate potential risks of contestation in a society that is marked by lower trust and higher scrutiny towards experts.

A regulatory challenge highlighted by external peers under this frame is the lack of standardization of review processes within the PBL organization. Responsibilities for scientific quality control are distributed among a number of people. Because review procedures are not standardized between PBL’s departments, serious review is not guaranteed in all circumstances. Moreover, reviewers are generally selected by the project leader and accordingly not anonymous, nor can they expect to be the most critical readers.

Policy clients note that the cultural challenge for PBL is to assure objectivity as ideologically minded researchers and reports sometimes build upon particular assumptions that are not always so well scientifically underpinned. They warn for this normative attitude, as it puts the credibility of PBL at risk. PBL practitioners acknowledge the ideological bias in their work; and how this may sometimes influence their choice of topics and methods. They acknowledge that transparency about viewpoints and definitions is essential. External peers suggest that review by experts with alternative views and assumptions would enable critical discussion about the values underpinning assumptions used in PBL studies. They remark that the task of reviewing needs higher priority within the PBL culture.

Methodological challenges under this frame are the set-up of criteria and approaches for organizing reviews. Issues that deserve attention are: anonymity of reviewers to the project leader, number of reviewers asked, what counts as a scientific review (as opposed to feedback from policymakers), timing of review. Under circumstances where PBL captures a limited level of knowledge on a particular topic (for example, development cooperation), early review may “prevent” knowledge gaps. A well-organized review system could avoid perceptions among clients that PBL messages are not always scientifically underpinned and sometimes reflect mere opinions.

Conceptions of what scientific advice “is” and “should do”

The three frames are not necessarily competitive, nor contradictory, yet the coexistence of three frames shows that various actor groups envision multiple meanings, roles and identities, this way “opening up”¹¹ a space to consider and evaluate a range of alternative institutional design options. The coexistence of the first and second frames mark the differentiated importance that actors allocate to particular types of study—integrated assessments (Frame 1), trend and foresight studies (Frame 2)—in view of crucial drivers for transition. A strong identity as integrated assessment specialist is crucial, knowing that PBL increasingly has to operate in dispersed multi-actor and multi-level governance settings. However, an identity as think tank allows PBL to put perspective in politicized problems. Pursuing both frames, as all actor groups do, raise alternative, though not necessarily mutually exclusive design options. The highlights of regulatory, cultural and methodological challenges under each frame signpost the potential directions for redesign. While reconciliation of both frames at methodological level (interdisciplinary capacity building under Frame 1 and

deliberative capacity building under Frame 2) may be feasible if resources are available, tackling the cultural and regulatory design implications of both frames might ask for different foci in future profiling and positioning of the PBL in the science–policy interface. Whereas Frame 1 conceives of PBL as the knowledgeable specialist who works across scales, levels and domains, under Frame 2 PBL is the visionary facilitator in societal debate. The coexisting third frame seems to offer a way out though, as PBL's trademark of trustworthy expert safeguards PBL's independent image regardless of type of study or setting, which all actor groups consider to be of paramount importance. With a reputation grounded in the role of trustworthy expert, PBL can accordingly appropriate the role of specialist or think tank to the type of setting and study.

Within and across frames, frame differences are notable. The four actor groups reflect a variety of interpretations of how PBL is (expected) to play its roles; revealing different conceptions of what scientific advice “is” and “should do”. Under Frame 1 the four actor groups convey different ideas on how to relate to policy levels other than national government, ranging from vertical client–supplier relationships to interactive knowledge-sharing or co-production. Under Frame 2 the appropriateness of the think tank role is a point of concern among practitioners as it may risk engagement with policy and political processes. External peers recognize a “speaking truth to power” attitude in the PBL organization and stress that cultural transition is needed to enact this role properly. Frame differences in Frame 3 become explicit in the motivations underneath the shared concern for normative bias, reflecting alternative interpretations of trustworthiness, including a focus on scientific underpinning, on transparency or on critical positioning towards alternative perspectives. What we can learn from these frame differences is that the modernist and the reflexive logic coexist in the knowledge–power nexus constituting the PBL organization. Moreover, analysing frame differences across the frames reveals that all actor groups convey elements of both logics when expressing their views on PBL's (future) identity and role, although external peers are more inclined to promote reflexivity and policy clients tend to adhere to modernist assumptions, whereas practitioners and management team remain in between to suit both.

On the one hand, this leads me to conclude that several of the reflexive principles endorsed by scholars discussing expert roles (Spruijt *et al.*, 2014) are notable in PBL context:

- *A certain amount of humility is noticeable:* Normative bias and ideological views are problematized in view of PBL's credibility, and critical review and transparency are considered necessary (Frame 3). Acknowledgement of one's own and organizational assumptions is also perceived as conditional to the performance of the think tank role that addresses the basis of competing viewpoints (Frame 2).
- *Deliberation and participation become accepted strategies:* They allow for embedding local knowledges in integrated assessment studies (Frame 1) and assure inclusiveness of perspectives to address unstructured societal problems (Frame 2). This is seen to benefit both the scientific quality and societal impact of PBL's assessment processes.

On the other hand, when it comes to institutionalization, the reflexive ideals still need a way to go. My analysis of frame differences reveals how most actors remain uncritical of several modernist beliefs (Weingart, 1999):

- *The preservation of boundaries between “science” and “politics”:* The assumption that knowledge is generated in a process isolated from politics is still very much alive. The think tank role is perceived as a technical–rational endeavour that

demarcates the stakeholder values from the politics in the policy system (Frame 2). A focus on advancing integration between various scientific methods (for example, modelling and governance analysis) in interdisciplinary work settings tends to demarcate integrated assessment as a scientific approach from the politics that interdisciplinary collaboration inevitably involves across various normative and epistemological commitments that originate in these disciplines (Frame 1).

- *The reinvention of objectivity:* While a belief in value neutrality is abandoned, the assumption that inherent biases and limitations can be solved by peer review and transparency reveals a belief in objectivity as scientific endeavour (Frame 3). Also the think tank role advocates a search for objectivity as it enables PBL to take distance from politicized problems, rather than engage with the broader societal values that influence policy. In other words, PBL practitioners seek to identify the evidence-based implications of perspective plurality “out there”, decontextualizing these perspectives from their own value systems.
- *Scientific privilege through peer review:* The notion of critical review inclines to be captured within the scientific discourse of peer reviewing. PBL's strategy for assuring its trustworthy expert status resides in the “virtue” of the rigorous and representative nature of the review process. The purpose of review is to assure the integrity of scientific methods and the soundness of the assessment process (Frame 3). A post-normal science role (Frame 2) and extended peer review strategy (Frame 3) are advocated to account for normative bias in PBL assessments and value diversity in the policy problem under study for the purpose of scientific quality assurance, rather than for reasons of social robustness or public accountability *per se*.

Similar to various scholars (Turnhout *et al.*, 2013; Beck *et al.*, 2014; Reinecke, 2015; Turnhout *et al.*, 2016), yet giving more profound insight into actors' belief systems using frame analysis reveals how newly found reflexive principles of humility, transparency and deliberation may unwittingly become encapsulated within modernist logics, unmasking persistent ideals of demarcation, objectivity and scientific privilege in scientific advice to governments.

Conclusion: towards a future for scientific advice to governments

Actors make sense of the paradoxical situation accompanying the transition process in governmental scientific advising by seeking and structuring their views about “necessary” reforms in logical chains of drivers, motivations, dilemmas, challenges, actions and so on. A set of strategic documents of PBL's transition process expressed those views and this article identified three frames reflecting PBL's future identity and role: PBL as integrated assessment specialist, PBL as think tank and PBL as trustworthy expert. What we can learn from this case is that actors struggle with the coexistence of modernist and reflexive logics in processes of institutional redesign, as is reflected in their beliefs of what scientific advice “is” and “should do”. On the one hand, there is awareness and willingness to act in more humiliate, transparent and deliberative manners—actors acknowledge uncertainties, biases of their own, a broad range of societal values and views implicated in policy problems and knowledge production—while at the same time they pertain to modernist beliefs in science/politics demarcations, objectivity and scientific privilege.

This article has illustrated how the advance of the institutionalization of a reflexive model for governmental science advising depends on a successful dialogue between various actor groups.

Different actors tend to emphasize on different situations, different stories and different solutions leading to frame differences, which represent a rich variety of perspectives, interpretations and understandings of what is going on (Laws and Rein, 2003). Institutional redesign involves, therefore, reconfigurations of social relationships and accompanying shifts in the knowledge–power nexus (Friedland and Alford, 1991). This requires flexibility of the knowledge/advisory infrastructure at large. Much depends on the steering relationship between the government and its scientific advisory bodies and the opportunities for rearranging this relationship. The Dutch government (as well as other governments in Europe) is redefining its position, seeking its role as facilitator of policy initiatives arising in an “energetic society”. This would imply that governments inevitably have to participate in the co-production of governance initiatives and thus collaborate with other policy and social actors. As knowledge and expertise are mobilized along the way, the shift from government to governance may bring forward different conceptions of what scientific advice is and should do, appropriating new roles to scientific advisers that allow them to participate in governance networks and advise to crucial policy and social actors, instead of government alone.

The challenge for governmental scientific advisers is to “translate” processes of institutional redesign into concrete social and cultural changes. Institutional reflexivity can uncover the underlying conditions and power relations affecting an individual’s or institution’s frame of reference (Stirling, 2006). Identities become multiple and standard rules and structures are called in question and become subject of debate (illustrated by the frame differences). Via diffusion of standard rules and structures, the reflexive logic may gradually gain influence in governmental scientific advising and may eventually become an institutionalized habit of thought (Jasanoff, 2003). Yet, the simple acknowledgement of assumptions, ideologies and power structures does not offer by itself an orientation for change. It also needs a transformational dimension based on a reasoned, jointly agreed normative orientation (Popa *et al.*, 2015). This article has illustrated how questioning and deliberating about the role and identity of one’s own organization is the first step. Yet, critical awareness needs to combine with critical action to generate dynamic processes of change and innovation in scientific advice to governments.

Notes

- 1 There are two more planning bureaus: SCP—Social and Cultural Planning Office of the Netherlands, and CPB—Netherlands Bureau for Economic Policy Analysis. Planning bureaus are governmental policy-analysis agencies. The term “planning bureau” is a typical Dutch invention. The first planning bureau, CPB, was established in the aftermath of WWII. The name is somewhat misleading; these institutes are not involved in planning the economy, or else, but in the provision of policy-relevant knowledge. For these reasons, they prefer to use terms like assessment agency, as in their English names, although their Dutch names are anchored in law and have become commonplace in Dutch political parlance (Halfman and Hoppe, 2005).
- 2 Independence is secured in legislative within the Regulation for Policy-Analysis Agencies, Article 4, which states that the three Dutch policy-analysis agencies (planbureaus) are solely responsible for the content and quality of their work and that policymakers should refrain from interference with research contents and methods (Staatscourant, 2012).
- 3 Funtowicz and Ravetz (1993) introduced the term “post-normal science” for issue-driven knowledge production in a context of hard political pressure, values in dispute, high decision stakes, and high epistemological and ethical systems uncertainties. In context of this article, post-normal science can be positioned as a strategy under the reflexive mode of advising.
- 4 In my definition of frame and framing, I relate to its use in the school of interpretive policy analysis (Yanow, 2003). This school builds on a social constructionist use of the concepts of frame and framing, which can be traced back to the work of the sociologist Goffman (1974), who argued that individuals perceive events in terms of

certain frameworks of understanding or “frames”, which provide them with a way of describing and interpreting the event.

- 5 PBL’s Assessment of the Human Environment reports cover the policy domains of spatial planning, physical environment and nature, and are produced biannually since 2010 and, before that, 15 times on an annual basis in the environment and nature domain, following statutory regulations. Its original objective is to offer the Dutch government and parliament support for policy prioritization and budget allocation based on insights in the (expected) policy performance. See PBL (2014b) for the latest report.
- 6 PBL’s Energetic Society report was published in 2011; former Director Maarten Hajer authored this publication (Hajer, 2011). During the process clients were involved to discuss preliminary findings in deliberative policy sessions, and employees were asked to comment on the essay, while internal discussion simultaneously served to get PBL researchers acquainted to governance analysis.
- 7 PBL’s Nature Outlook 2010–2040 was published in 2012 (PBL, 2012); during political turmoil on budgetary constraints on nature development, this report depoliticized the debate by presenting four different perspectives on nature and nature policy.
- 8 The term “unstructured issues” is used by actors groups to refer to issues that are characterized by complexity on both cognitive and normative dimensions. For a definition, see the work of Hoppe (2009).
- 9 The concept of post-normal science was introduced by Funtowicz and Ravetz (1993), see footnote 3 for an explanation of the term.
- 10 During the period covered in this study 2011–2015, three PBL studies were subject of public contestation, which PBL acted upon by organizing deliberation with extended peers on the epistemological and normative assumptions within the assessment studies. See PBL’s review of the IPCC fourth assessment report (PBL, 2010), a PBL publication on food consumption and production (PBL, 2013a) and a PBL publication on biodiversity indicators (PBL, 2014a).
- 11 Stirling introduces the conception of “opening” up to point out the greater need for the appreciation of plural, socially situated understandings of epistemological and normative commitments in innovation processes (Stirling, 2008; Stirling, 2010).

References

- Beck S *et al* (2014) Towards a reflexive turn in the governance of global environmental expertise: The cases of the IPCC and the IPBES. *GAIA*, 23 (2): 80–87.
- Bijker WE, Bal R and Hendriks R (2009) *The Paradox of Scientific Authority: The Role of Scientific Advice in Democracies*. MIT Press: Cambridge, MA.
- de Wit B and Merckx F (2014) Evaluating the societal quality of research carried out by PBL Netherlands Environmental Assessment Agency. PBL Working Paper 19. PBL Netherlands Environmental Assessment Agency: The Hague.
- Fischer F (2000) *Citizens, Experts and the Environment: The Politics of Local Knowledge*. Duke University Press: London.
- Fischer F (2009) *Democracy & Expertise: Reorienting Policy Inquiry*. Oxford University Press: Oxford.
- Flyvbjerg B (2006) Five misunderstandings about case-study research. *Qualitative Inquiry*, 12 (2): 219–245.
- Foucault M (1995) *Discipline and Punish: The Birth of the Prison*. Random House: New York.
- Friedland R and Alford RR (1991) Bringing society back in: Symbols, practices, and institutional contradictions. In: DiMaggio PJ and Powell WW (eds). *The New Institutionalism in Organizational Analysis*. University of Chicago Press: Chicago, IL.
- Funtowicz SO and Ravetz JR (1993) Science for the post-normal age. *Futures*, 25 (7): 735–755.
- Gluckman P (2014) The art of science advice to government. *Comment in Nature*, 507 (7491): 163–165.
- Goffman E (1974) *Frame Analysis. An Essay on the Organization of Experience*. Northeastern University Press: Boston, MA.
- Gottweis H and Braun K (2007) Participatory Governance and Institutional Innovation [PAGANINI]. Contract No. CIT2-CT-2004-505791. Deliverable Number 18. 6th EU Framework Programme for Research and Technology. University of Vienna: Vienna.
- Hajer MA (2009) *Authoritative Governance: Policy-Making in the Age of Mediatization*. Oxford University Press: Oxford.
- Hajer MA (2011) Trends report. The energetic society. In search of a governance philosophy for a clean economy. PBL Netherlands Environmental Assessment Agency, <http://www.pbl.nl/en/publications/2011/trends-report-the-energetic-society-in-search-of-a-governance-philosophy-for-a-clean-economy>.
- Hajer MA (2012) A media storm in the world risk society: Enacting scientific authority in the IPCC controversy (2009–10). *Critical Policy Studies*, 6 (4): 452–464.
- Hajer MA and Wagenaar H (2003) *Deliberative Policy Analysis: Understanding Governance in the Network Society*. Cambridge University Press: Cambridge, UK.
- Halfman W (2005) Science-policy boundaries: National styles? *Science and Public Policy*, 32 (6): 457–467.
- Halfman W and Hoppe R (2005) Science/policy boundaries: A changing division of labour in Dutch expert policy advice. In: Maasen S and Weingart P (eds).

- Democratization of Expertise? Exploring Novel Forms of Scientific Advice in Political Decision-Making. Springer: Dordrecht, The Netherlands.
- Hoppe R (2009) *The Governance of Problems: Puzzling, Powering and Participation*. Policy Press: Bristol.
- ICSU. (2014) Synthesis report Science Advice to Governments Conference. Auckland, New Zealand: Office of the Prime Minister's Science Advisory Committee, New Zealand.
- Irwin A (1995) *Citizen Science: A Study of People, Expertise and Sustainable Development*. Polity Press: London.
- Irwin A and Michael M (2003) *Science, Social Theory and Public Knowledge*. Open University Press: Maidenhead, UK.
- Jasanoff S (2003) Technologies of humility: Citizen participation in governing science. *Minerva*; **41** (3): 223–244.
- Jasanoff S (2005) *Designs on Nature: Science and Democracy in Europe and United States*. Princeton University Press: Princeton, NJ.
- Kunseler E-M and Vasileiadou E (accepted for publication) Practising environmental policy evaluation in context of co-existing evaluation imaginaries. *Evaluation*.
- Kunseler E-M, Tuinstra W, Vasileiadou E and Petersen AC (2015) The reflective futures practitioner: Balancing salience, credibility and legitimacy in generating foresight knowledge with stakeholders. *Futures*; **66**: 1–12.
- Laws D and Rein M (2003) Reframing practice. In: Hajer MA and Wagenaar H (eds). *Deliberative Policy Analysis: Understanding Governance in the Network Society*. Cambridge University Press: Cambridge, UK.
- Lentsch J and Weingart P (2011) *The Politics of Scientific Advice: Institutional Design for Quality Assurance*. Cambridge University Press: Cambridge, UK.
- Maasen S and Weingart P (2005) *Democratization of Expertise? Exploring Novel Forms of Scientific Advice in Political Decision-Making*. Springer: Dordrecht, The Netherlands.
- Metze T and Turnhout E (2014) Politiek, participatie en experts in de besluitvorming over super wicked problems. *Bestuurskunde*; **23** (2): 3–11.
- Nowotny H, Scott P and Gibbons M (2001) *Re-Thinking Science: Knowledge and the Public in an Age of Uncertainty*. Polity Press: Cambridge, UK.
- Pallett H and Chilvers J (2014) Organizations in the making: Learning and intervening at the science-policy interface. *Progress in Human Geography*; **39** (2): 146–166.
- PBL. (2010) Assessing an IPCC assessment. An analysis of statements on projected regional impacts in the 2007 report. PBL Netherlands Environmental Assessment Agency, <http://www.pbl.nl/en/publications/2010/Assessing-an-IPCC-assessment.-An-analysis-of-statements-on-projected-regional-impacts-in-the-2007-report>.
- PBL. (2012) Nature Outlook 2010–2040—Summary and findings. PBL Netherlands Environmental Assessment Agency, <http://www.pbl.nl/en/publications/2012/nature-outlook-2010-2040-summary-and-findings>.
- PBL. (2013a) De macht van het menu. PBL Netherlands Environmental Assessment Agency, <http://www.pbl.nl/publicaties/de-macht-van-het-menu>.
- PBL. (2013b) PBL responses to audit recommendations. PBL Netherlands Environmental Assessment Agency, <http://www.pbl.nl/publicaties/internationale-wetenschappelijke-evaluatie-van-het-pbl-2008-2012>.
- PBL. (2014a) Biodiversiteit bekeken: hoe evalueert en verkent het PBL het natuurbeleid? PBL Netherlands Environmental Assessment Agency, <http://www.pbl.nl/publicaties/biodiversiteit-bekeken-hoe-evalueert-en-verkent-het-pbl-het-natuurbeleid>.
- PBL. (2014b) The future is now. Assessment of the Dutch Human Environment, <http://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2014-Assessment-of-the-dutch-human-environment-1597.pdf>.
- PBL Audit Committee. (2013) International scientific evaluation of PBL 2008–2012. PBL Netherlands Environmental Assessment Agency, <http://www.pbl.nl/publicaties/internationale-wetenschappelijke-evaluatie-van-het-pbl-2008-2012>.
- Petersen AC, Cath A, Hage M, Kunseler E and van der Sluijs JP (2011) Post-normal science in practice at The Netherlands Environmental Assessment Agency: Science, technology and human values. *Science Technology Human Values*; **36** (3): 362–388.
- Pielke RA Jr (2007) *The Honest Broker: Making Sense of Science in Policy and Politics*. Cambridge University Press: Cambridge, UK.
- Popa F, Guillermin M and Dedeurwaerdere T (2015) A pragmatist approach to transdisciplinarity in sustainability research: From complex systems theory to reflexive science. *Futures*; **65**: 45–56.
- Proctor RN (1991) *Value-Free Science? Purity and Power in Modern Knowledge*. Harvard University Press: Cambridge, MA.
- Reinecke S (2015) Knowledge brokerage designs and practices in four European climate services: A role model for biodiversity policies? *Environmental Science & Policy*; **54**: 513–521.
- Scott JC (1999) *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press: New Haven, CT.
- Spruijt P, Knol AB, Vasileiadou E, Devilee J, Lebret E and Petersen AC (2014) Roles of scientists as policy advisers on complex issues: A literature review. *Environmental Science & Policy*; **40**, 16–25.
- Staatscourant. (2012) Aanwijzingen voor de planbureaus Nr. 3200, http://wetten.overheid.nl/BWBR0031972/geldigheidsdatum_16-09-2012.
- Stirling A (2006) Precaution, foresight and sustainability: Reflection and reflexivity in the governance of science and technology. In: Voss JP, Bauknecht D and Kemp R (eds). *Reflexive Governance for Sustainable Development*. Edward Elgar: Cheltenham, UK, pp 225–272.
- Stirling A (2008) “Opening up” and “closing down”: Power, participation and pluralism in the social appraisal of technology. *Science Technology and Human Values*; **33** (2): 262–294.
- Stirling A (2010) Keep it complex. *Nature*; **468** (7372): 1029–1031.
- Termeer CJAM and van den Brink M (2013) Organizational conditions for dealing with the unknown unknown. *Public Management Review*; **15** (1): 43–62.
- Tuinstra W and Hajer MA (2014) Deliberatie over klimaatkennis. De publieke omgang van het PBL met IPCC-fouten en klimaatsceptici. *Bestuurskunde*; **23** (2): 38–45.
- Turnhout E, Dewulf A and Hulme M (2016) What does policy-relevant knowledge global environmental knowledge do? The cases of climate and biodiversity. *Current Opinion in Environmental Sustainability*; **18**: 65–72.
- Turnhout E, Stuiver M, Klostermann J, Harms B and Leeuwis C (2013) New roles of science in society: Different repertoires of knowledge brokering. *Science and Public Policy*; **40** (3): 354–365.
- Weick KE (1995) *Sensemaking in Organizations*. Sage: Thousand Oaks, CA.
- Weingart P (1999) Scientific expertise and political accountability: Paradoxes of science in politics. *Science and Public Policy*; **26** (3): 151–161.
- Wesslink A and Hoppe R (2011) If post-normal science is the solution, what is the problem?: The politics of activist environmental science. *Science Technology & Human Values*; **36** (3): 389–412.
- Yanow D (2003) Accessing local knowledge: Policy analysis and communities of meaning. In: Hajer MA and Wagenaar H (eds). *Deliberative Policy Analysis: Understanding Governance in the Network Society*. Cambridge University Press: Cambridge, UK.

Data availability

The datasets generated and/or analysed during the current study are not publicly available due to the confidentiality of internal affairs within the PBL Netherlands Environmental Assessment Agency, but are partially available from the corresponding author on reasonable request.

Acknowledgements

The writing of this article has been made possible by the PBL Netherlands Environmental Assessment Agency's Open Assessment research programme. The author would like to thank workshop participants and interviewees for their fruitful input. Thanks also to Willemijn Tuinstra for discussion and reflection during the writing process.

Additional information

Competing interests: The author declares no competing financial interests.

Reprints and permission information is available at http://www.palgrave-journals.com/pal/authors/rights_and_permissions.html

How to cite this article: Kunseler E-M (2016) Revealing a paradox in scientific advice to governments: the struggle between modernist and reflexive logics within the PBL Netherlands Environmental Assessment Agency. *Palgrave Communications*. 2:16029 doi: 10.1057/palcomms.2016.29.



This work is licensed under a Creative Commons Attribution 4.0 International License. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in the credit line; if the material is not included under the Creative Commons license, users will need to obtain permission from the license holder to reproduce the material. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>