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KoordinatorIn/ ProjekteinreicherIn:	BOKU - University of Natural Resources and Life Sciences; InFER – Institute of Forest, Environment and Natural Resource Policy
Kontaktperson Name:	Anja Bauer
Kontaktperson Adresse:	Institut für Wald-, Umwelt- und Ressourcenpolitik Feistmantelstraße 4 1180 Wien
Kontaktperson Telefon:	01 47654 4404
Kontaktperson E-Mail:	anja.bauer@boku.ac.at
Projekt- und KooperationspartnerIn (inkl. Bundesland):	Albert-Ludwigs-Universität Freiburg, Professur für Environmental Governance, Deutschland
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Projektübersicht

1 Kurzfassung

Die effektive Verbindung von wissenschaftlichen Erkenntnissen und politischen Entscheidungen stellt seit langem eine große Herausforderung politischer Steuerung dar – vor allem im komplexen Bereich des Klimaschutzes und der Klimawandelanpassung. Gleichzeitig wird die operative Verknüpfung von substanziellem Wissen und politischen oder gesellschaftlichen Entscheidungen bislang als nur mäßig effektiv gesehen, was sowohl Wissenschaft wie auch Politik dazu bewegt, neue, effektivere Formen der wissenschaftlichen Politikberatung einzufordern. Im Forschungsprojekt ReSciPI wurden diese neuen Formen der Wissenschaft-Politik-Gesellschafts-Interaktion mit dem Konzept der ‚*knowledge brokerage*' (KB) gefasst.

ReSciPI untersuchte und verglich innovative Modelle wissenschaftlicher Politikberatung in der Klimapolitik in verschiedenen OECD-Ländern. Es liefert damit politikrelevante Erkenntnisse dazu, wie in Österreich (aber auch darüber hinaus) Klimawissenschaft und Klimapolitik möglichst produktiv verknüpft werden können. Dabei konnte zuletzt auch gezeigt werden, dass Wissenschaft-Politik-Interaktionen klar über die simplifizierte Annahme eines einfachen, linearen Transfers von Wissen hinausgehen. Politikberatung muss vielmehr als dynamischer, oft interaktiver Prozess des Austauschs und der Aushandlung politischer Prioritäten und kognitiver Geltungsansprüche zwischen verschiedenen Akteursgruppen verstanden werden.

Im ersten Projektabschnitt wurde eine umfassende Bestandsaufnahme der österreichischen Landschaft wissenschaftlicher Klimapolitikberatung durchgeführt, um die Stärken, Schwächen, Potenziale und Hindernisse für eine effektive Wissenschaft-Politik-Interaktion zu identifizieren. Auf Basis von Dokumentenanalysen, 24 ExpertInnen-Interviews sowie einem ersten Stakeholder-Workshop konnte eine Reihe von Spezifika der österreichischen Klimapolitikberatungslandschaft bestimmt werden: Österreichische Klimapolitikberatung zeichnet sich durch Überschaubarkeit („Kleinheit") der Klimaforschung und Klimapolitik, durch eine einflussreiche Rolle von Sozialpartnern und Verwaltung in der Vermittlung von wissenschaftlicher Expertise und die große Bedeutung informeller Kontakte für die Wissenschaft-Politik-Interaktion aus. Darüber hinaus finden sich ein starker Einfluss politischer „Rationalitäten", mangelnde institutionalisierte Kommunikation von Forschungsergebnissen und deren Unsicherheiten sowie ein geringer Grad an Transparenz. Insgesamt finden wir einen starken Einfluss der neo-korporatistischen Politikkultur Österreichs auf die Wissenschafts-Politik-Beziehungen in der Klimapolitik, auch wenn es einige wenige Tendenzen hin zu einer pluralistischeren Interaktion gibt.

Der zweite Abschnitt des ReSciPI-Projekts zielte auf einen systematischen Überblick und Vergleich von 30 Institutionen wissenschaftlicher Politikberatung in 11 Ländern. Die erhobenen Institutionalisierungsformen reichen von Forschungsinstitutionen mit Beratungsaktivitäten über wissenschaftliche Beratungsgremien und -prozesse bis hin zu Internet-gestützten Informationsdienstleistungen und –plattformen. Darüber hinaus hat die Bestandsaufnahme ein breiteres Spektrum an Beratungsaktivitäten identifiziert: Diese umfassen die Identifizierung von Wissensbedürfnissen und Forschungslücken, den Aufbau und die Koordinierung von beratungsbezogenen Akteursnetzwerken, die systematische Zusammenstellung und „Übersetzung" wissenschaftlicher Informationen, die Bereitstellung von Entscheidungsunterstützungswerkzeugen und –methoden, die Analyse, Evaluation und Entwicklung von Politikoptionen, personenbezogene Formen der Politikberatung und Konsultation wie auch klassische und interaktive Formen von Öffentlichkeitsarbeit. Erfolgreiche Beratungsinstitutionen nehmen zumeist mehrere dieser Aktivitäten gleichzeitig wahr. Damit sollte letztendlich nicht nur die praktische Relevanz wissenschaftlicher Erkenntnisse, sondern auch deren wissenschaftliche Glaubwürdigkeit und gesellschaftliche Legitimität sichergestellt werden.

Der Schwerpunkt des dritten Arbeitspakets bestand darin, neun besonders innovative Beratungsinstitutionen in vier Ländern vertiefend zu untersuchen. Das Projekt identifizierte eine Reihe institutioneller Innovationen, die maßgeblich zu einer effektiven Wissenschaft-Politik-Interaktion beitragen:

Die Voraussetzungen für erfolgreiche Politikberatung werden häufig schon ganz zu Beginn durch *systematische Anstrengungen zur Identifizierung von Wissensbedürfnissen und Forschungslücken* geschaffen. Ein innovatives Beispiel dafür ist das niederländische Forschungsprogramm Knowledge for Climate (KfC).

Die *Regionalisierung* von Beratung erweist sich als erfolgreiche Strategie im deutschen Forschungsprogramm KLIMZUG und im niederländischen KfC. In Schwerpunktgebieten arbeiten WissenschafterInnen mit Praxisakteuren in Forschungs- und Umsetzungsprozessen eng zusammen, um so Wissensbedürfnissen und Erwartungshorizonten der NutzerInnen gerecht zu werden.

Die *zielgruppenspezifische Kommunikation* des deutschen Climate Service Centers (CSC) und des britischen United Kingdom Climate Impact Programme (UKCIP) sowie die *Verkoppelung (match-making)* zwischen WissensanbieterInnen und –nachfragerInnen durch das InfoSystem des schweizerischen ProClim- und den Call Down Service des schottischen Centre of Expertise on Climate Change (CXC) versuchen der Fragmentierung und schweren Zugänglichkeit von Informationen für NutzerInnen zu begegnen.

Die Kombination von Eigenschaften von Ressortforschungseinrichtungen und inhaltlich spezialisierten Beiräten trägt zur politischen Relevanz des britischen Climate Change Committee (CCC) und seines Adaptation Sub-Committee (ASC) bei. Neben einem *eindeutigen politischen Mandat* verfügen die Einrichtungen über *eigene wissenschaftliche Kapazitäten* für Assessments und Synthesepapiere.

Um der oft konstatierten fehlenden Berücksichtigung von wissenschaftlicher Expertise in politischen Entscheidungen entgegenzuwirken, verknüpft das Potsdam Institut für Klimafolgenforschung (PIK) natur- und wirtschaftswissenschaftliche Ergebnisse auf hohem Niveau mit praktischen Wissensbeständen in *transdisziplinären Formaten*.

Viele Beratungsinstitutionen stellen *interaktive Entscheidungsunterstützungsinstrumente* (*Decision Support Tools*) bereit, um die Handlungen von EntscheidungsträgerInnen zu beeinflussen. Beispiele hierfür sind web-basierte Plattformen wie der vom CSC initiierte und koordinierte Klimanavigator, der Nutzer-spezifische Abfragen und Auswertungen ermöglicht, oder der UKCIP Adaptation Wizard, bei dessen Konzipierung relevante Stakeholder bereits eingebunden wurden.

Ein zentrales Kriterium für erfolgreiche Politikberatung stellt außerdem der *Bezug zu konkreten Adressatengruppen* dar. Während verschiedene Fachministerien oftmals im Fokus wissenschaftlicher Beratungsanstrengungen stehen, führen Parlamente und deren Mitglieder häufig ein Schattendasein. Die in der Schweiz von ProClim- unterstützte Parlamentarische Gruppe „Klimaänderung“ stellt eine der wenigen prominenten Ausnahmen dar.

Obwohl Medien und die breite Öffentlichkeit oft nur „nebenher“ angesprochen werden, finden sich viele innovative Formen der Medien- und Öffentlichkeitsarbeit: Der deutsche WBGU und KLIMZUG-NORD setzen z.B. auf das Stilmittel des Comics, um ihre Botschaften zu Klimaanpassung plakativ zu vermitteln; das PIK betreibt ein Klimamuseum und entwickelt Brettspiele. Viele Institutionen setzen mittlerweile auf das Internet; manche betreiben über Blogs oder Apps bereits eine Art „Politikberatung 2.0“.

Das letzte Arbeitspaket war der Synthese zentraler Forschungsergebnisse und der Ableitung politikrelevanter Schlussfolgerungen für Österreich gewidmet. Dazu wurde erstens ein zweiter Stakeholder-Workshop abgehalten, bei dem die Übertragbarkeit der internationalen Referenzbeispiele auf den österreichischen Kontext kritisch diskutiert wurde. Zum Zweiten wurde ein systematischer Vergleich zwischen Ländern mit ähnlicher neo-korporatistischer politischer Kultur, konkret Österreich, Niederlande und Schweiz, durchgeführt, um damit Einsichten in die Kultur- und Kontextgebundenheit wissenschaftlicher Politikberatungspraktiken zu gewinnen. Auf Basis dieser Synthese war es möglich, konkrete Anknüpfungspunkte für die produktive Verbindung von Klimawissenschaft und –politik in Österreich aufzuzeigen. Gleichzeitig konnte klar aufgezeigt werden, dass erfolgreiche Formate nicht allzu schematisch kopiert werden können oder sollten. Der Ländervergleich in ReSciPI hat deutlich gezeigt, dass Formen und Inhalte wissenschaftlicher Politikberatung stark vom jeweiligen politisch-kulturellen Kontext abhängig sind.

2 Executive Summary

The ReSciPI project started from the observation that the complex field of climate change mitigation and adaptation is in urgent need of sound scientific expertise. At the same time, the operative linking of substantive knowledge and political and societal decision-making still proves to be a difficult task. Therefore, scholars as well as policy-makers call for new, more effective types of science-policy interactions, which ReSciPI conceptualized as '*knowledge brokerage'* (KB).

ReSciPI investigated and compared innovative models of scientific advice-giving in the field of climate policy in various OECD countries. With that, it provided policy-relevant insights on how to improve institutions and processes of KB – in Austria and beyond. Overall, it could be shown that science-policy interactions in many cases go far beyond the simple notion of 'linear knowledge transfer.' Scientific policy advice rather has to be seen as a dynamic, often interactive process in which various actors negotiate the relevance and cogency of political priorities and knowledge claims.

The first work package was devoted to a comprehensive mapping and assessment of the institutions, actors and processes of science-policy interactions in Austrian climate policy in order to identify the strengths, weaknesses, potentials and obstacles for an effective KB. Based on document analyses, 24 expert interviews and a first stakeholder workshop, we identified a number of specificities of the Austrian climate KB landscape: The Austrian landscape is composed of a small set of actors from science, politics, and interest groups who engage in rather closed, informal networks in which the social partners and ministry officials play a prominent role. Beyond that, we found a strong influence of political 'rationalities,' a lack of institutionalized communication of research findings (including their inherent uncertainties) and a low degree of transparency. Overall, our analysis revealed strong imprints of Austria's neo-corporatist political culture on science-policy interactions in climate policy. Nevertheless, our study also identified instances of pluralist advice-giving that contradict neo-corporatist arrangements.

The second work package aimed to systematically map and compare 30 different forms and modes of climate KB in 11 countries. The observed forms of institutionalization range from research institutes that provide advisory services over scientific advisory bodies and advisory processes to internet-based information services and platforms. Beyond that, our survey showed that KB institutions engage in a broad range of advisory activities, which include the systematic identification of knowledge needs and research gaps; the initiation and coordination of networking activities; the systematic compilation and 'translation' of scientific information; the development of decision support methods and tools; focussed policy analysis, evaluation and the development of policy options; different forms of personal policy advice and consultation; and finally classical as well as interactive forms of public outreach. Successful advisory institutions typically provide several of those activities at the same time. With that, KB institutions in the end not only strive to ensure the practical relevancy of their scientific insights, but they also try to bolster the scientific credibility and societal legitimacy of their advice.

The third work package aimed at an in-depth analysis of nine innovative KB institutions in four different countries. This in-depth case analysis showed a number of institutional innovations:

Search for questions, not only for answers: The foundations for successful KB are already laid at the beginning of an advisory process, namely when knowledge needs and research gaps are identified. An innovative example for a systematic agenda setting approach is the Dutch Knowledge for Climate (KfC) programme.

Regional and collaborative research programmes: The regionalisation of policy advice is an important strategy especially in the field of climate adaptation. The German research programme KLIMZUG and the Dutch KfC programme both work in regional 'focus areas' and, with that, are better able to integrate various stakeholder groups and thus provide research that is *more* responsive to the expectations and knowledge needs of specific users.

Target group-oriented communication: The German Climate Service Centers (CSC) and the United Kingdom Climate Impact Programme (UKCIP) strive to counter the high level of fragmentation and poor accessibility of decision-relevant information by providing their services in a highly target group-specific way. Other KB institutions confine their services to pure 'match-making,' i.e. linking information providers with knowledge

demands. The online data base (InfoSystem) of the Swiss ProClim- and the so-called Call Down Service of ClimateXChange Scotland (CXC) are outstanding examples for that.

Hybrids between advisory bodies and departmental research: The work of the British *Committee on Climate Change* (CCC) and its *Adaptation Sub-Committee* (ASC) is marked by high political relevance that is mainly due to a clear political mandate coupled with own research capacities for the drafting of assessment reports and synthesis papers.

Research institutions heading for Mode 2 research: In order to avoid the notorious problem that scientific expertise remains unconsidered in actual decisions, some research institutes, like the Potsdam Institute for Climate Impact Research (PIK), build on more transdisciplinary formats in which they tie together sophisticated natural scientific and economic modelling with practical knowledge.

Decision support – tools and beyond: Many advisory institutions build on the use of interactive decision support tools in order to influence political, economic and societal actors and decisions. Prominent examples include web-based platforms, like CSC's *Klimanavigator*, which allows for use-specified queries and analyses, or UKCIP's Adaptation Wizard, which was designed in close cooperation with relevant stakeholders.

Targeting (new) addressees: Successful policy advice is often characterised by a strong orientation towards particular user groups. Many KB institutions see ministerial administrations as their most important target group; at the same time, parliaments and their members tend to be side-lined. A remarkable exception is the Parliamentary Group "Climate Change" in Switzerland that, for example, organizes lunch events for parliamentarians.

*'Advice 2.*0': In many cases, KB institutions also target the media and the broader public; however, that is often seen more as a 'by-product.' Nonetheless, informing the public and media sometimes takes quite innovative forms: *KLIMZUG-NORD*, for instance, uses catchy comics to convey its central messages on climate change and adaptation to the younger; PIK hosts a climate museum and developed a board game. In addition, many institutions make heavy use of the internet and increasingly employ "advice 2.0" formats, such as webinars, Wikis, blogs, podcasts.

The project's last work package focussed on the synthesis of key research insights and the deduction of policy-relevant conclusions for Austria. For that, first, a second stakeholder workshop was held in which the question of the transferability of insights gained from the international reference cases to the Austrian context was critically discussed. Secondly, we conducted a systematic country comparison in which we contrasted KB practices in countries with a similar, neo-corporatist political culture, namely Austria, the Netherlands and Switzerland. The comparison clearly showed that practices of scientific policy advice are highly context-dependent and, therefore, the simple transposition of successful international examples to Austria is not feasible. At the same time, ReSciPI could still highlight some specific starting points for the more productive linking of science and policy-making in Austrian climate policy.

3 Hintergrund und Zielsetzung

Initial situation and motivation for the project

ReSciPI started from the assumption that the complex field of climate change mitigation and adaptation is in urgent need of 'usable knowledge' and that sound scientific expertise has the potential to make valuable contributions to more effective policies. At the same time, the operative linking of substantive knowledge and political and societal decision-making still proves to be a difficult task. In the context of climate change, the development of the science-policy nexus has to be seen as a dialectical process that is threatened simultaneously by either the excessive 'scientification of politics' (and the related spectre of 'technocracy') or the undue 'politicization of science' (Weingart 1999). Compared to other social problems, climate change mitigation and adaptation are marked by a number of specific characteristics, including its high degree of complexity, high and conflicting societal stakes, and the need to act under conditions of uncertainty. Effective climate action, therefore, requires new types of science, coming under tags like 'post-normal science' (Funtowicz and Ravetz 1993; Lorenzoni, Jones, and Turnpenny 2006; Storch 2009) or 'mode 2 science' (Gibbons et al. 1994; Nowotny, Scott, and Gibbons 2003). But it also requires new types of science-policy interactions which are conceptualized as 'knowledge brokerage' in ReSciPI.

Up to now, scholarly analyses were available mainly on the setup, operating conditions and effectiveness of scientific advice bodies at the international level (esp. on the IPCC) (Beck 2009; Beck 2011; Boehmer-Christiansen 1994; Boehmer-Christiansen 1994; Bolin 2007; Edwards and Schneider 2001; Hulme 2009; Hulme 2010; Hulme and Mahony 2010; Pielke 2007; Pielke 2010; Pielke 2010; Pielke and Sarewitz 2005). In contrast to that, there was only some scattered research available on national or sub-national regimes in some selected countries, e.g. for USA: (Knuth, Nagle et al. 2007; Pielke 2008; Selin and VanDeveer 2007), for UK: (Owens 2010; Wynne, Simmons et al. 2001), for Germany: (Beck 2004; Storch 2009; Weingart, Engels et al. 2000), for Canada: (Cohen 1997), for Sweden: (Lövbrand 2007) and for Switzerland: (Arquit Niederberger 2005), but there was no comprehensive overview and systematic comparison of national advice settings, and there was no thorough analysis of climate KB available for Austria.

Objectives and research steps of ReSciPI

Against the background of these knowledge gaps the overall objective of ReSciPI was to provide policy-relevant insights on how climate science and climate policy can be integrated in more productive ways, especially with respect to the question of how science-policy interactions can be effectively institutionalized and how processes of knowledge brokerage (KB) between various actor groups (including climate scientists, policy-makers, interest group representative, civil society actors, and the media) can be fostered. Specifically, ReSciPI aimed to:

i. map and analyse the institutions, actors and processes of science-policy interaction in Austrian climate policy in order to identify the strengths, weaknesses, potentials and obstacles for an effective knowledge brokerage;
ii. provide an overview of concrete forms of institutionalization of KB in climate policy in different countries;
iii. get a profound understanding of how climate science and climate policy are effectively integrated in selected innovative KB processes;
iv. provide options on how to improve institutions and processes of KB.

4 Projektinhalt und Ergebnis(se)

These four objectives were addressed in four corresponding work packages. A fifth work package served the management and dissemination of the project.

WP1: Mapping of knowledge brokerage in Austrian climate policy

Since no systematic analysis of science-policy interactions in Austrian climate policy existed prior to ReSciPI, only little was known about how scientific knowledge is transferred and used in Austrian climate change mitigation and adaptation policies, which institutions and actors systematically deal with knowledge brokerage and how effective the linking between science and policy is. ReSciPI addressed this knowledge gap in WP1 by mapping and structuring the Austrian knowledge brokerage landscape in climate policy.

The results of WP1 encompass a mapping of the actors and organizational advisory formats, the categorization of the selection criteria for researchers' expertise, an assessment of the overall relevance of scientific knowledge, and the identification of dominant patterns of science-policy interactions. The mapping (see Figure 1) demonstrated that besides research organizations, a range of hybrid organizations, such as think tanks, the environment agency or meteorological services, are engaged in the co-production and brokerage of knowledge for climate policy. Besides ministerial officials and interest groups not only have a role as knowledge users but are also strongly engaged in the co-production of knowledge. Thus, a clear differentiation between scientists as knowledge producers and decision-makers as knowledge users cannot be made. This leads to a revised understanding of the science-policy interface as a blurred, not clearly discernible boundary. Science-policy interactions in Austrian climate policy are mainly undertaken ad-hoc and issue-specific. Frequently forms of interaction are contract research, the involvement of experts in strategy developments, thematic research programs, and informal contacts.

Figure 1: The Austrian landscape of climate policy advice

Regarding the relevance and use of scientific expertise for politics, administration and interest groups the opinions of the interviewees are quite ambiguous: On the one hand scientific expertise is highly valued for the

own activities in politics, administration and interest groups. On the other hand, the overall relevance of scientific expertise for the Austrian climate policy is generally assessed to be only moderate. Overall, scientific expertise serves several functions in climate policy. Expertise is used *instrumentally* when knowledge on specific issues is needed. This can be observed, when actors open up new issue areas or aspects and ask for background and detailed information. But scientific knowledge is also often used *strategically*. Thus it serves as a basis for the argumentation of different actors in political processes, for example in comments on draft bills or in personal interactions. Expertise, in this case, serves to strengthen the positions of actors against other positions. Sometimes studies are also used as a means for *conflict resolution*. They are commissioned when different actors within ministries and beyond are in disagreement and when negotiation processes are blocked.

Overall, we found that science-policy interactions in Austrian climate policy are characterized by a perceived proximity of the landscape of climate science and climate policy, a dominant influence of institutional factors and neo-corporatist patterns of interaction. Against this background we reflected our results in the context of the strong neo-corporatist political culture in Austria.

Neo-corporatist political culture (excerpt from Hermann et al. forthcoming)

Our study revealed both, strong traits of Austrian neo-corporatism and instances of pluralist advice-giving that contradict neo-corporatist arrangements (see Table 1). Neo-corporatist actors, i.e., federal administration and the social partners, are able to exert dominant influence on climate policy and advice as knowledge users, brokers, and experts that provide practical advice. Because the legislative body plays an almost negligible role as broker and addressee of scientific knowledge, the climate science-policy landscape reflects the parliament's weak role in Austrian neo-corporatism. The central position of neo-corporatist actors also manifests in the high relevance of informal contacts and of mixed and political advisory formats which simultaneously constitute main venues for science-policy interactions. The low importance of purely scientific advisory arrangements allows neo-corporatist actors to complement climate scientists' expertise and confine its leverage. Frequently researchers' expertise just provides some basis for subsequent primarily interest-guided climate policy-making.

Table 1 - Characteristics of science-policy interactions in Austrian climate policy

	Neo-corporatist patterns	Pluralist patterns
Actors & organization	Narrow actor networks Administration and social partners as main addressees Negligible role of the parliament High relevance of informal contacts Only mixed and political advisory bodies	ENGOs as addressees Research programs increasingly substitute contract research
Selection criteria	Personal integrity Institutional affiliation Potential to create political consensus	
Relative relevance	Limitation of the leverage of scientific knowledge by practical expertise and interests of administration and social partners Selective knowledge brokerage by administration and social partners	ENGOs as holders of policy-relevant practical expertise ENGOs as brokers of scientific expertise
Interaction patterns	High degree of cooperation and coordination among scientists and neo-corporatist actors Considerable lack of transparency in scientific policy advice	Supply-driven initiatives of scientific policy advice Tendency toward more transparent policy advice

The criteria for selecting scientists and the patterns of science-policy interaction also considerably adhere to neo-corporatist principles of interest representation and consensus-orientation: The actual choice of scientists often draws on mutual agreement among neo-corporatist actors or on the researchers' ability to provide a potentially fruitful basis for consensus-oriented bargaining. Strategic selection of scientific experts sometimes results in the attribution of individual climate researchers to certain policy actors. Close collaboration of researchers and neo-corporatist actors along all steps of advisory processes further substantiates the significance of neo-corporatist patterns. Additionally, climate advice is predominantly lacking in transparency due to the importance of informal contacts, the codes of conduct for advisory bodies, and limited public participation which again are typical features of Austrian neo-corporatist advice-giving.

Nevertheless, some features of the Austrian climate science-policy landscape do not comply with neo-corporatist political culture, but are characteristics of pluralist advisory settings. They can be interpreted as reflecting a gradual decline in the dominant political culture and expressing specific features of Austrian climate policy. We observed a growing involvement of ENGOs as users, brokers, and experts in formalized mixed and political advisory processes beyond the traditionally accredited social partners. That comes along with a stronger coordination of ENGOs with researchers and traditional neo-corporatist actors. The fact that ENGOs nowadays constitute important actors in the field of climate policy points to a policy-specific broadening of interest representation and consensus-orientation to environmental interest groups. Other characteristics of the interface are more in line with emerging general advisory patterns that accompany the decline in Austrian neo-corporatism: The gradual shift toward formalized, competitive selection processes in research programs indicates a more pluralist integration of scientific expertise into policy-making. Recent efforts to foster the supply-driven provision and the visibility of scientific climate advice also provide instances of more pluralist advice-giving: expert scientific advice becomes more visible, more open to public scrutiny, and increasingly politically independent.

Further reading:

- Hermann, A.T., A. Bauer, M. Pregernig, S. Reinecke, K. Hogl and T. Pistorius (2012): Die Interaktion von Wissenschaft und Politik in der österreichischen Klimapolitik, InFER Diskussionspapier 01/2012.

WP2: Cross-national inventory of types of institutionalization of KB in climate policy

In the field of climate change mitigation and adaptation, a great number of scientific advisory bodies have been established both at the national and at the international level, with IPCC undoubtedly being the most prominent one. Contrary to general perception, scientific policy advice not only takes place in classical formats, like IPCC-like expert panels or advisory committees, but – especially when seen from the broader perspective of KB – takes on much more varied forms. Against this background WP2 aimed to systematically map and scrutinize different (traditional but mainly new) forms and modes of KB in various industrialized countries. The overview encompassed a systematic survey of 30 knowledge brokerage institutions (KBIs) in eleven OECD countries.

The analysis of the 30 KBIs particularly provided insights on (1) the institutionalization of knowledge brokerage, (2) the various modes of knowledge brokerage, and (3) the pathways to effectiveness.

(1) Institutionalization of knowledge brokerage

On a general note, we wanted to gain an understanding of the different ways in which knowledge brokerage is organized. In this regard, we identified 4 basic forms of institutionalization of KB in our sample and distinguishable sub-varieties therein. *Inter alia*, sub-variations reflect differences in permanence, in the degree of institutionalization, in the size of the body or in the vicinity to the 'political system'. The left-hand column in Table 2 shows our deductively derived KBI typology; the right-hand column lists the cases in our sample.

Table 2: Typology of knowledge brokerage institutions

No.	Types	Cases in sample
1	Research institutions	
1.1	Research institutes at universities	Center for International Climate and Environmental Research (CICERO) United Kingdom Climate Impact Programme (UKCIP, *until 2011*)
1.2	Non-university research institutes and think tanks	Adaptive Futures / Coastal Zone Management Pty Ltd (CZM) ecologic Institute Potsdam Institute for Climate Impact Research (PIK) Stockholm Environment Institute (SEI)
1.3	Departmental research institutes and state agencies	Royal Netherlands Meteorological Institute (KNMI) Competence Centre for Climatic Consequences and Adaptation at the German Environment Agency (KOMPASS) Netherlands Environmental Assessment Agency (PBL) Institute of Agricultural Climate Research at the Thünen Institute (TI-AK)
1.4	Networks of research organizations	Centre for Climate Systems Modeling at ETH Zurich (C2SM) Global Climate Forum (GCF, Potsdam) National Climate Change Adaptation Research Facility (NCCARF) Tyndall Centre for Climate Change Research (esp. until 2010)
1.5	Thematically focused (climate) research programs	Climate Adaptation Flagship of CSIRO (CAF) Knowledge for Climate research program (KfC, 2008-2014) KLIMZUG – Climate Change in Regions (2008-2013)
2	Scientific advisory bodies	
2.1	Standing scientific advisory bodies	Climate Change Committee (CCC), incl. Adaptation Sub-Committee (ASC) German Advisory Council on Global Change (WBGU)
2.2	Ad hoc scientific advisory bodies	Danish Commission on Climate Change Policy (DCCCP, 2008-2010) Ethics Commission on a “Safe Energy Supply” (4-28 May 2011)
2.3	Chief Scientific Advisors	UK (Government) Chief Scientific Adviser (G)CSA)
3	Scientific advisory processes	
3.1	Policy-driven expert assessment processes	Climate Change Risk Assessment (CCRA) United States National Climate Assessment (NCA)
3.2	Collaborative planning fora with participation of scientists	The Delta Programme (2010-2014) Regional Adaptation Collaboratives (RACs, 2009-2012) Regional Climate Change Partnerships (RCCPs)
4	Information exchange platforms	Climate Service Center (CSC) Platform Communication on Climate Change (PCCC) Forum for Climate and Global Change (ProClim)

The KBIs in our sample range from venues with strong degrees of institutionalization to more process-based and dynamic institutions with rather loosely linked institutional structures. Moreover, one can distinguish more classical, unidirectional forms of institutionalization from more interactive patterns of KBI with science and policy interlacing within one institutional set-up, like in the case of *scientific advisory bodies* at ministries or parliaments or of *collaborative planning fora*.

The *establishment* of a KB institution is mainly driven by governmental actors (in 19 out of 30 cases). In contrast, it is rather an exception that science or business mark sole initiators of KBIs (total: 5) – at least in our sample. In comparably more cases (6) the initiation of a KBI is the result of a joint effort of science with different societal actors. Also in the *funding* of KBIs, politics is central and often provides a substantial part of the institutional core, seed, or project funding. Funding may be channelled more directly from ministries or agencies at country and state level but may also take more indirect ways through publicly financed research programs (managed, e.g., by research councils or ministries). While 20 out of the 30 cases heavily rely on public funds, our sample also

illustrates that the sources of funding are increasingly becoming diverse. Besides commissioned research we also find, for instance, fees for membership or for research products as well as donations.

(2) Knowledge brokerage activities

A thorough representation and collection of the whole plethora of activities that KBIs engage in was a central concern in our survey. By means of systematic inductive stock-taking we arrived at seven broader types of activities, in the sense of distinct patterns that occurred in multiple cases of our sample. The different activity types together with distinctive approaches of how to enact them are given in Table 3.

Table 3: Types and subtypes of knowledge brokerage activities

Type of KBA		*Sub-types*
KBA1	Knowledge needs and research gaps identification	state-of-knowledge reviews research evaluation /validation user consultation
KBA2	Coordination and networking activities	peer networking stakeholder networking pure 'match-making'
KBA3	Compiling and translating scientific information	scientific assessments science translation approaches
KBA4	Decision support	decision support tools capacity building
KBA5	Policy analysis, evaluation and development	policy analyses / evaluation develop policy / draft legislation
KBA6	Personal policy advice and consultation	chief scientist designation to advisory bodies ad hoc advice to policy quasi-political representation
KBA7	Public outreach	internet-based classical mass media 'enacted' forms

(2) Pathways to effectiveness

A further key result of WP2 is a systematic account of the strategies and mechanisms to ensure effectiveness of knowledge brokerage. We based our analysis on the three attributions saliency, credibility and legitimacy (SCL) that are widely established in the literature as pathways to effectiveness. We found that knowledge brokerage institutions employ a range of organizational, procedural and rhetorical strategies and mechanisms to foster saliency, credibility and legitimacy (see Table 4).

Table 4: Strategies and mechanisms in support of saliency, credibility and legitimacy

	Strategy	Mechanism
Saliency	Programmatic problem- and decision-orientation	Orientation at societal problems and their solutions in objectives and mission statements Targeting concrete decisions or political addressees Scaling to regional or local levels
	Demand-driven approach	Political initiation of KBI Research strategy and priorities in consultation with users Single projects user-initiated or formulated with the involvement of users
	Participation in KB activities	Consultation Collaborative research
	Institutionalized societal steering, advice or evaluation	Societal advisory or steering bodies Mixed advisory or steering bodies (scientific and societal) Evaluation of societal relevance and impact
	Policy vicinity	Liaison offices Frequent personal contacts and in-house stays KBI staff speaking on behalf of principals
	Provision of use-tailored products	Policy summaries, briefs etc. User-tailored maps and tools
Credibility	Competence and reputation of staff and KBI as a whole	Academic qualifications and experiences Leading and renowned scientists Reputation of organization
	Scientific collaboration	Networking with other scientific organizations Collaboration with renowned scientists
	Organizational independence	Organizational and financial autonomy Self-initiated KB activities Presentation as 'honest broker'
	Scientific quality standards and procedures	Guidelines of good scientific practice State of the art research Disclosure of uncertainties Use of authoritative sources
	Product quality	Publication record in peer reviewed journals
	Scientific advice, steering, evaluation	Scientific advisory or steering bodies Mixed advisory or steering bodies (scientific and societal) Evaluation of scientific quality
Legitimacy	Transparency	Transparency in organization and processes Transparency in outputs and products
	Inclusiveness	Stakeholder participation (but mostly just as a 'by-product') Involvement of different (partly: opposing) views and interests

Our study showed that KBIs employ different organizational, procedural and rhetorical strategies to meet saliency, credibility and legitimacy. In many instances, concerns for effectiveness are already reflected in the *organizational* design and setup of KBIs. Most notably a number of KBIs in our sample have institutionalized steering or advisory bodies some of which are only or predominantly made up of (renowned) scientific members and, with that, particularly help to bolster a KBI's credibility; other steering or advisory bodies have mixed membership or are made up of societal stakeholders and, with that, probably help more to strengthen a KBI's saliency. Besides organizational strategies, KBIs also draw on *procedural* strategies and related mechanisms to enact saliency, credibility and legitimacy. The consultation and involvement of non-scientific actors in the identification of research needs or in the actual research processes is one of the most frequently found strategies in our set of cases. Consultation and participation can be geared towards saliency and/or legitimacy. In addition to

participation, the adherence to scientific standards, publication in peer reviewed journals or disclosure of uncertainties mark other important procedural mechanisms found in our set of cases. These last-mentioned mechanisms are mainly seen to enact a KBI's claim of credibility. In addition to organizational and procedural strategies, KBIs also strongly make use of *rhetorical* strategies to strengthen their SCL (claims) vis-à-vis different audiences. For example, in how far KBIs adhere to scientific quality standards in their actual work and, hence, whether their results are credible is difficult to assess for outsiders, especially in the complex and uncertainty-laden area of climate science. Consequently, organizational mechanisms (like the establishment of scientific advisory structures) or procedural mechanisms (like provisions that ensure the adherence to scientific standards) become transmission belts for credibility only – or at least primarily – if they are openly conveyed to a KBI's external audiences. For many of the analysed KBIs, the overt declaration of independence is a particularly important rhetorical mechanism.

Further reading:

- Reinecke, S., A. Bauer, M. Pregernig, A.T. Hermann, T. Pistorius and K. Hogl (2013): Scientific climate policy advice: An overview of national forms of institutionalization; InFER Diskussionspapier 2/2013.

  The discussion paper includes the overview, an analysis of the KB institutions and modes as well as the pathways to effectiveness. It is complemented by a compendium of the analysed KB institutions encompassing succinct profiles of each individual case.

WP3: In-depth analysis of selected innovative KB institutions

While the stock-taking survey in WP2 served to get a broad overview of forms and modes of KB in climate policy in a larger number of countries, in WP3 we aimed to achieve a profound understanding of how climate science and climate policy are effectively integrated in a limited number of innovative KB institutions. We analysed nine KBIs and featured exemplary brokerage activities of those institutions. The analysed cases all strive to provide and translate scientific expertise for decision-making in politics and society in the area of climate change. In broad terms, the case studies have further demonstrated that venues of scientific policy advice range from classical research institutions and governmental agencies, over collaborative research programmes to climate services to information and networking hubs. Similarly, we observed diverse knowledge brokerage activities which increasingly build on a dynamic understanding of the science-policy interface. In particular, we singled out seven innovative approaches in KB models and activities that are summarized in the following.

(1) Regional and collaborative research programmes

Climate change policy, in particular in the area of adaptation, often entails the development and implementation of policies and measures at regional and local levels. Accordingly, KBIs increasingly scale their activities to regions in order to provide research that is more responsive to the expectations and knowledge needs of specific users. The German research programme *KLIMZUG*, for instance, analyses regional vulnerabilities and develops approaches to deal with the consequences of climate change in seven regions. A key concern is the build-up of institutional capacities, inter alia, by activating and strengthening regional cooperative networks, which encompass actors from science, policy, industry, business and civil society. Similarly, the Dutch research programme *Knowledge for Climate* (KfC) organizes research around so called 'Hotspots,' i.e. eight regional areas across the country in which partners from science and practice collaborate in all phases of the research and implementation process. An outstanding design element of KfC is that the localized research in Hotspots is intertwined with and complemented by more overarching and disciplinary work in the so called 'Themes'.

(2) Climate Service Centres – no „one-size-fits-all"

While regionalisation allows KBIs to be close to their 'customers,' it hardly addresses the strong fragmentation of climate expertise, which often makes it difficult for potential users to draw on the knowledge they need. One approach to counter fragmentation is the establishment of climate service centres. In ReSciPI, we identified two

different models: first, the „full service centre“ and, second, cases that only fulfil specific service functions. The German *CSC* and the British Climate Impacts Programme *UKCIP* are examples for the first approach, which offers a broad spectrum of user-tailored climate information products and services.

More focused types, in contrast, confine their services to networking or pure match-making, i.e. linking information providers with knowledge demands. The Swiss *ProClim*-, for instance, links actors from government, administration, business or media with climate science by means of an online data base (*InfoSystem*) and by the organisation of different dialogue events. With the so called *Call Down Service CXC* actively explores the knowledge needs of the Scottish administration and translates these into meaningful research questions; researchers may apply to provide concise responses – typically policy briefs – on short call.

(3) Hybrids between advisory bodies and departmental research

The British *Committee on Climate Change* (CCC) and its *Adaptation Sub-Committee* (ASC) are characterised by a remarkable vicinity to political decisions and can be classified as a kind of hybrid institution between departmental research and expert body. In contrast to many classical departmental research institutions, which perform more routine environmental reporting tasks, CCC and ASC have a stronger focus on concrete policies (e.g. setting and monitoring sector specific *carbon budgets*); while, at the same time, they differ substantially from specialized advisory bodies because they are equipped with (more) own research capacities. The committees hardly conduct primary research, but draw on a huge body of expertise either through commissioned studies, or through their own assessment and synthesis work. The high political relevance of the CCC and ASC substantially builds upon their strong political mandate (esp. qua *Climate Change Act 2008*) and their ties to government administration.

(4) Research institutions heading for Mode 2 research

Despite vocal calls for more ‘evidence-based policy-making,’ scientific expertise often remains unconsidered in actual decisions. One reason is found in the classical form of knowledge production, known as Mode 1 science, that rests upon overly academic, disciplinary and hierarchical research. In contrast, Mode 2 science strongly relies on interdisciplinarity and a close collaboration with non-scientific actors. The *Potsdam Institute for Climate Impact Research* (PIK) explicitly follows this new approach and ties sophisticated natural scientific and economic modelling together with practical knowledge. This new orientation is also manifested in the organizational structure of the institute: two out of four research domains („Sustainable Solutions“ and „Transdisciplinary Concepts & Methods”) are specifically dedicated to this research approach.

(5) Decision support – tools and beyond

The effectiveness of scientific policy advice is eventually measured against its ability to influence political, economic and societal actors and decisions. Accordingly, a number of advisory institutions build on the use of interactive decision support tools. Prominent examples include web-based platforms, like Klimanavigator (www.klimanavigator.de) that has been initiated and coordinated by CSC, or KlimafolgenOnline (www.klimafolgenonline.com), a service jointly developed by PIK and WetterOnline.de. While all those instruments allow for use-specified queries and analyses, *UKCIP’s* approach goes one step further: In order to ensure its applicability to actual decision making, UKCIP has involved relevant stakeholders already in the development of the tools. In the design of the Business Areas Climate Assessment Tool (BACLIAT) and the Local Climate Impacts Profiles (LCLIP), for instance, future users were invited to bring in their local knowledge, e.g. as regards potential climate impacts. In addition, UKCIP has put great efforts into building capacities (e.g. through trainings and workshops) in order to allow local and regional decision makers to use the new tools in a competent way.

(6) Search for questions, not only for answers

The design and implementation of a decision support system can mark the end point of a successful project of scientific policy advice. However, it is important not to forget that the foundations for successful knowledge brokerage are already laid at the very beginning of an advisory process, namely when knowledge needs are identified. An innovative example for a systematic agenda setting approach is the Dutch *KfC* programme: In a first

step, stakeholders in the eight Hotspots defined specific regional knowledge needs, which scientists, subsequently, translated into concrete research questions. Some of those research questions were converted into applied research projects in which scientists and stakeholders worked closely together in a transdisciplinary way. In the last step, the partners will implement the research results, primarily in the context of the elaboration of regional adaptation strategies. With this ambitious integration strategy, which spans all phases of an applied research project, KfC's Hotspots can be characterised as 'real-world laboratories', even though – as our ReSciPI results suggest – the integration of the perspectives of scientists and decision-makers is far from easy.

(7) Targeting (new) addressees

Successful policy advice is often characterised by a strong orientation towards particular user groups. Most of the KBIs in this report address more than one target group. Across all countries and types of KB institutions political decision makers, and in particular representatives of ministerial administrations, mark the most frequently targeted group. In contrast, parliaments and their members tend to be side-lined. A remarkable exception is the *Parliamentary Group "Climate Change"* in Switzerland which organizes lunch events. ProClim- facilitates these regular events that aim at presenting and discussing recent insights in climate science with parliamentarians.

In many cases advisory institutions also target the media and the broader public. However, KB institutions often see that more as a by-product of their advisory activities rather than a primary purpose. Nonetheless, informing the public and media often takes quite innovative forms: *KLIMZUG-NORD*, for instance, uses catchy comics to convey its central messages on climate change and adaptation to the younger; PIK hosts a climate museum and developed a board game. In addition, many institutions make heavy use of the internet and increasingly employ "advice 2.0" formats, such as webinars, Wikis, blogs, podcasts.

Pathways to effectiveness

Moreover, in WP3 we deepened and refined the analysis of the strategies and mechanisms to enhance SCL (see above) and identified interdependencies, synergies and trade-offs between the three attributions (Mitchell, Clark et al. 2006; Sarkki, Niemelä et al. 2013). Regarding interdependencies, societal relevance, for example, can decrease when the technical credibility is not given and hence the authoritativeness is lost. Similarly, legitimacy also depends on the credibility and the overall societal usefulness of advice. But besides these synergetic relations the single strategies to ensure SCL may also take opposite directions and lead to trade-offs or areas of tensions. For example, striving for saliency and credibility at the same time can sometimes be difficult because it requires the balancing of partly opposing demands, namely that of policy makers and that of the scientific community. We summarized these trade-offs along five specific areas of synergies and tensions:

(1) Institutional ties: Between political vicinity and independence

KBIs have a hard time to work close to the political and societal sphere to ensure their relevance, while at the same time following strict scientific rules and procedures to maintain their independence and credibility (Mitchell, Clark et al. 2006). In many instances, the relevance of policy advice suffers if KBIs are – for the sake of ensuring their credibility – too distant from political agendas, however, they risk their independence if they get too close to political struggles (Pregernig 2004).

(2) Identification of research questions: Between stakeholder demands and scientific curiosity

Scientific research questions are often perceived as too abstract or far away from the needs of political and societal decision-makers. In order to avoid this pitfall all analysed KBIs have structures or procedures in place to capture the demands of non-scientific actors in their agenda-setting. While these procedural strategies and mechanisms aim at ensuring saliency, they at least partly conflict with the requirements of scientific inquiry.

(3) Participation: Between relevance and inclusivity

Participation of stakeholders and/or citizens has become a core principle of many knowledge brokerage institutions and activities. It is widely assumed that by involving non-scientific actors the relevance as well as

societal robustness of research is strengthened. Consultation and participation can be geared towards all three attributions of saliency, credibility and legitimacy and thus provide synergetic effects. In the majority of the analysed cases consultation and participation are primarily used to increase the practice-orientation and usability of KB activities. Saliency is strengthened through consultation of the relevant stakeholders. Credibility is fostered when actors are brought in because of their local or regional knowledge. Participation seems to be geared towards legitimacy concerns if and whenever KBIs strive to establish a broad representation of different societal perspectives and values, e.g. when KBIs explicitly try to include climate change sceptics or address the citizenry at large. But participation may also lead to contradictions between the three attributions of saliency, credibility and legitimacy. The broad and open inclusion of differing views, which is often sought to build consensus and with that legitimacy, may slow and prolong knowledge brokerage activities and hence undermine the relevance of results for target audiences. Limiting inclusion to the most important addressees for the sake of saliency, in turn, may lead to a loss in legitimacy because other actors or views are excluded and the KBI may, in consequence, be seen as serving only the interests of established elites. In addition, participation may jeopardize the credibility of the technical dimension when assumingly 'unknowledgeable' participants are involved.

(4) Policy Advice: Between impartiality and advocacy

The challenge of the 'right distance' between science and policy making also arises when KBIs are confronted with the question of what kind of policy advice they should, could or have to give. In this context, scientists are challenged by different demands from politics and society but also from their peers. The relevance of scientific policy advice might be reduced by both, a too reserved or open position concerning concrete guidance or directions as well as a too narrow constriction of the political scope of action. A too prescriptive advice may lessen saliency from the beginning, because it leaves no room for political considerations and hence the advice is ignored. However, prescriptive advice may in some instances also enhance saliency because clear answers are given while a policy advice that provides a range of options may be ignored because it lacks clear guidance. Credibility and legitimacy may also be lost when KBIs provide clear political recommendations and hence become politicised.

(5) Communicating research: Between understandability and scientific accuracy.

A widely recognised challenge concerns the communication of research results to decision-makers and the broader public that ideally should be understandable for a non-expert audience on the one side without losing scientific accuracy on the other side. KBIs produce a wide variety of services and products that take different formats and are targeted at different audiences. For several KBIs dissemination or knowledge transfer has become an important aspect of their work. This is for example reflected organizationally in the establishment of a communication office (UKCIP, PBL, KfC). In addition scientists are often asked to present their information to practitioners, be it in formal settings like parliamentary hearings, in workshops, or in informal personal contacts. In these instance researchers are challenged by combining scientific standards with the demand for understandable information. The dealing with and communication of uncertainties is a particular illustrative example for the trade-offs between relevance and credibility in communicating results to non-scientific audiences.

Further reading:

- Reinecke, S., A.T. Hermann, A. Bauer, M. Pregernig, K. Hogl and T. Pistorius (2013b): Innovative climate policy advice: Case studies from Germany, the Netherlands, Switzerland and the UK. InFER Forschungsbericht 1/2013

WP4: Synthesis and policy–relevant conclusions for effective knowledge brokerage in Austrian climate policy

Building on the previous work packages in which peculiarities of climate KB in Austria were identified (WP1) and insights on successful (and informative 'stranded') cases of science-policy interaction in various industrialized countries were generated (WP2 and WP3), WP4 was dedicated to the synthesis and critical reflection of the empirical results, particularly with regard to their transferability to the Austrian context.

The synthesis of the project consisted of two parts. First we explored the transferability of innovative approaches in a workshop with representatives of science, intermediary organisations and administration. Secondly, we compared the characteristics of Austrian science-policy interactions with science-policy interactions in similar political cultures.

(1) Workshop discussion on the transferability of innovative approaches and options for improved science-policy interactions in Austria

Almost all representatives of science, politics, administration and interest groups either in the interviews or in the workshops stated that a stronger and better integration of scientific expertise in Austrian climate policy is necessary. Over the last years a few new initiatives started (StartClim or the CCCA), yet these initiatives mainly origin from the scientific sphere and remain modest due to a lack of financial and personal resources. Hence, in general terms, all innovative approaches that we identified in ReSciPI (see above) could serve as models and inspirations for more effective science-policy interactions in Austrian climate policy. However, as the analysis in WP1 has demonstrated and the representatives of science and administration in the 2nd workshop confirmed, the scope for the transferability of innovative and more extensive approaches is rather limited in current Austrian climate policy. Workshop participants observe that science has little significance in Austrian society and politics in general, a situation that is reinforced by the media landscape that largely neglects science. For Austrian climate policy participants note generally low importance of climate policy on the political agenda, little tradition to rely on evidence-based decision-making, currently high budget constraints and often a lack of political will. Against this background opportunities for the institutionalization of innovative knowledge brokerage approaches increase when (a) they are compatible with existing institutions and (b) when (economic and/or political) costs are low. The bigger, central KBIs we analysed such as PIK or PBL are perceived as "too big" by the workshop participant. Moreover the KB model 'scientific advisory board' or 'commission' is dismissed because it is perceived to be too slow for daily politics and past experiences with this model in Austria are considered as little successful. A model like the British CCC/ASC with an extensive and statutory mandate is for the participants in the current Austrian situation hardly imaginable. Given these constraints the "smaller" models offer better starting points for improving science-policy interactions in Austria, at least in the short-term:

(1) The Scottish CXC Call Down Service can serve as an inspiration for the *networking* of scientists as well as for *short-term issue-specific advice* that reacts fast to questions of daily politics. Participants highlighted the importance of the communication between scientific disciplines to make results relevant for climate policy. While small programmes such as StartClim offer some starting points more incentives for inter- and transdisciplinary research or networking is perceived necessary. In this respect the CXC could provide inspiration on how to foster networking between scientists and disciplines with the aim to provide societal and policy advice. Moreover, participants noted that science should be able to react to short-term political questions and on the other side politics and administration should name relevant issues in a clear manner. The CXC also in this respect offers insights on how such demand could be channelled.

(2) The *parliamentary* lunch groups that are organized by the Swiss ProClim- could serve as an impulse for scientific and particularly intermediary organizations (such as CCCA) to not only address administrative actors (as is currently often the case) but also to engage with new target groups such as parliamentary actors. Workshop participants see the stronger involvement of the parliament in science-policy interactions as a possible way to keep climate policy on the political agenda.

(3) The workshop participants picked up on the presented r*egional and collaborative approaches* of knowledge brokerage (in particular the German KLIMZUG and the Dutch KfC) and saw opportunities for such regional approaches in the formulation and development of the provincial adaptation strategies. This could also help to overcome the "federal phlegmatism" in climate policy. In general terms collaborative approaches of science-policy interactions have good preconditions in the Austrian political culture that often features a style of negotiation and consensus orientation between various actors groups. In this respect participants wished for a stronger role of environmental NGOs that so far are largely absent from important committees.

(4) The analysed international cases have further demonstrated that there is much room for improvement in terms of *transparency and visibility* of climate policy advice in Austria. While the models of CCC and PBL as a whole are hardly transferable to the current Austrian context, their approaches to communicate and disseminate to politics but particularly the wider public could very well serve as impulses for more transparency in Austrian science-policy interactions. Here the very open disclosure and dissemination strategy of the CCC/ASC but also PBL's approach to communicate uncertainties may serve as examples for scientific institutions, intermediary organizations as well as politics and administration.

(5) An open question of the workshop remained in how far international knowledge brokerage institutions could be used for Austrian climate policy and whether this is wanted at all.

Besides these discussions on the more short- and medium term transferability of innovative KB approaches the workshop also highlighted the long-term and structural challenges for Austrian climate policy advice. Participants in particular saw the need for a change in the awareness and political culture. In order to initiate such change workshop participants pointed to the need to highlight the usefulness of scientific inputs and the increase of visibility and relevance of science in political and public debates. The participants perceived the project ReSciPI as a good starting point for a better awareness for and knowledge of the specifics of scientific policy advice.

(2) Country comparison

A second, more analytically oriented, synthesis step was the comparison of science-policy interactions in Austria with other countries. By this comparison we wanted to answer in how far challenges are inscribed in the political culture and whether and how countries with a similar political culture deal with these challenges and how they potentially overcome them. Consequently we compared Austria, the Netherlands, and Switzerland as similar case studies that exhibit pronounced instances of neo-corporatist advice-giving. The results of this comparison can be summarized as follows (excerpt from the draft article Hermann and Hogl forthcoming):

Our results indicate prevailing traits of neo-corporatism in all three countries. Only some features go beyond these traditional advisory arrangements. Nevertheless, we could illustrate that not only typical politico-cultural advisory patterns appear, but different features coexist in scientific advisory scenes of specific policy domains (see Table 5). Most characteristics of the scientific advisory landscapes reflect the three countries' traditional neo-corporatist structures: Semi-public research institutes, which are often funded by public administration and recognized economic interest groups, play an important role as providers of scientific knowledge to inform climate policy-making. Neo-corporatist actors, moreover, exert considerable influence on climate policy advice as practical experts and points of brokerage of scientific expertise. The central role of these actors manifests in well-established formal and informal ways of advice-giving which simultaneously constitute important formats for climate science-policy interactions. The low importance of purely scientific advisory arrangements allows neo-corporatist actors to complement climate scientists' expertise. The affiliation of researchers with certain interests due to strategic utilization and politicization of researchers' knowledge corresponds to typical politico-cultural patterns. Furthermore, the interactions considerably adhere to neo-corporatist principles of interest representation and consensus-orientation when researchers, administration, and recognized interests closely collaborate along all steps of the research and advisory process. The lack of transparency in scientific climate policy advice considerably relates to the relevance of informal contacts, orientation toward compromise, and the codes of conduct of mixed and political advisory bodies in neo-corporatist settings. Overall, our analysis revealed that

interest-guided policy-making prevails over evidence-based decision-making in Austrian, Dutch and Swiss climate policy.

Table 5 - Features of Science-policy Interactions in Austrian, Dutch, and Swiss Climate Policy

	Neo-corporatist features	Atypical features
Scientific knowledge providers	Semi-public research institutes and think tanks	Relevance of private research institutes (e.g., think tanks, consultancy agencies)
Non-scientific knowledge providers	Ministry officials as important knowledge providers and brokers Representatives of formally accredited economic interest groups as important knowledge providers	Representatives of environmental interest groups as important knowledge providers
Organizational formats	Importance of traditional neo-corporatist advisory formats (e.g., mixed and political advisory bodies, informal contacts) No involvement of scientific expertise in the development of laws due to interest-guided climate policy-making	Increasing integration of researchers in the development of adaptation strategies Parliaments as fora for science-policy interactions Networking and deliberative features (e.g., networks of researchers, online platforms)
Interaction patterns	High degree of coordination among researchers, ministry officials, and specific interest groups High degree of non-transparency of scientific policy advice (esp. regarding the processing of scientific expertise)	Broadening of the coordination beyond organized interests Inclination toward enhancing transparency of scientific climate advice by policy-makers and researchers

Despite predominantly neo-corporatist features, we note that the three science-policy interfaces share some characteristics that counter typical advisory structures. The increasing relevance of private research institutes, ENGOs, and diverse stakeholders represent clear variations from ideal-type neo-corporatist advice-giving and are in line with decline tendencies. Particularly the importance of environmental interest groups constitutes a typical feature of climate policy and the extended stakeholder involvement reflects peculiarities of adaptation policy. In addition to a growing incorporation of scientists into political strategy development, the roles of parliaments as venues for scientific policy advice in the Netherlands and Switzerland, and the rise of deliberative networking formats counter basic notions of neo-corporatist advice-giving. Furthermore, we observed indicators for a broadening of coordination and transparency in scientific climate policy advice.

The majority of instances that counter the idea of neo-corporatism in Austrian, Dutch and Swiss climate policy emanate from the field of adaptation policy. Mitigation policy is a well-established policy field in which states have to meet international emission reduction obligations that directly affect economy. Contrary to mitigation policy, the emerging domain of adaptation policy can be considered as a ‘playing field’ that is not at the very centre of neo-corporatist arrangements because political and economic cleavages have not yet been fully established. Moreover, adaptation policy more strongly addresses the regional and local level and, subsequently, a broader set of stakeholders.

Further reading:

- ReSciPI Policy Brief: Gut beratene Klimapolitik? Innovative Modelle wissenschaftlicher Klimapolitikberatung, September 2013 .

5 Schlussfolgerungen und Empfehlungen

The main findings of the project can be grouped under four headings: (1) Austria and the politico-cultural context of science-policy interactions, (2) the diversity of knowledge brokerage institutions, (3) the hybridization of knowledge brokerage, (4) the effectiveness of science-policy interactions and (5) starting points for improved science-policy interactions in Austria.

(1) Austria and the politico-cultural context of science-policy interactions

The analysis of science-policy interactions led to the conclusion that the strong neo-corporatist political culture in Austria also influences the ways in which knowledge is brokered and used in Austrian climate policy. Nevertheless, our study also identified instances of pluralist advice-giving that contradict neo-corporatist arrangements. The coexistence of dominant neo-corporatist and some pluralist advisory features indicates a certain diversity of Austrian science-policy interactions in the domain of climate policy. Nevertheless the neo-corporatist tradition has to be taken into account when discussing about the transferability of innovative approaches of knowledge brokerage.

The innovative models and approaches of knowledge brokerage analysed in the project can serve as inspiring examples for a more productive interaction of climate science and politics in Austria, but also beyond. However, successful formats are no blue prints and should not be copied in an overly schematic way. Our analysis demonstrates that venues, modes and design of scientific climate policy advice differ across countries. Germany and the UK, for example, exhibit a diversified advisory landscape and a long tradition in involving university and non-university research institutions in science-policy networks and advisory bodies. As a consequence, knowledge may be more scattered and hence calls for stronger networking activities as provided, for example, by UKCIP and the CSC. In other countries, like the Netherlands and Switzerland, the advisory landscape is considerably smaller. A limited number of KBIs play a key advisory role and partly have a privileged access to policy makers and political processes. PBL, as one of three Dutch assessment agencies, for instance, exhibits such a special standing in Dutch climate policy. Also in Switzerland the advisory landscape revolves to a large degree around one institution, i.e. ProClim- as a central hub. Against the background of these differences the reshaping of science policy interactions, thus, needs to be highly responsive to the respective politico-cultural context.

(2) Diversity of KB institutions

Our typology of *knowledge brokerage institutions* has shown that the knowledge brokerage domain is indeed a hybrid one, which provides varied venues for science-policy interactions. Research institutions, whether university or non-university, state agencies as well as scientific advisory bodies are ‘classical’ actors of policy advice and often strongly rooted in the science domain. However, KBIs do not necessarily have to be located in academia but may be close to the political domain. This is particularly apparent in the cases of collaborative planning forums. The analysed regional partnerships in Canada and the UK are clearly no scientific endeavours, *per se*, but oriented at supporting adaptation action of various actors. However, they engage with science and have an influence on policy in the regions. In such hybrid venues decision-makers and stakeholders are not only passive addressees of policy advice but serve as active knowledge brokers themselves. This observation also holds with respect to more classical venues of science, like research programs. All of our analysed research programs involve non-scientific actors and, at times, even give them considerable decision-making power over contents and design. Thus, the delineation between science and non-science is increasingly voided in favour of a hybrid knowledge brokerage domain. Noticeably, in our set of case studies many of these hybrid venues emerge in the context of climate change adaptation.

(3) Hybridization of knowledge brokerage activities

Overall, our analyses show insightful empirical patterns on the changing science-policy interactions: Our analysis and classification of different *knowledge brokerage activities* has demonstrated that roles and positions in the

knowledge brokerage domain are not rigid assigned but are shifting and floating. We found more classical activities, such as scientific assessments in form of a written report or classical personal advice. In these instances, the source of policy advice remains largely situated in the science domain and it relies on a more linear transfer to the political domain. On the other side, we found a wide range of innovative knowledge brokerage activities and processes that involve decision-makers and stakeholders beyond their role as mere addressees. In many cases, interaction between scientists, policy-makers, interest groups, the media and citizens is deliberately sought, be it via internet platforms, in workshops or other events. The interaction serves, on the one side, the negotiation of knowledge needs and agendas for policy advice; on the other side, it enhances the understanding for the 'science behind climate change' and ultimately aims at the conceptual use of policy advice. The demarcation between classical linear forms and interactive forms of policy advice, however, cannot be deduced from the type of knowledge brokerage institutions in a clear and distinct way. Rather, almost all KBIs draw from different sides of the spectrum of knowledge brokerage. Hence we conclude, that while there remains a substantive amount of practical KB approaches that are built on the idea of a more linear model of knowledge transfer from science to policy, we also see that the idea of designing more interactive and dynamic science-policy interactions flourishes and supports the development of a broad set of innovative approaches.

(4) Effectiveness of science-policy interactions

Our research demonstrated that effectiveness is not passively experienced but deliberately created (though not fully controlled) by the KBIs, which employ three distinct types of strategies to support SCL: (i) KBIs put in place specific *organizational* designs or set-ups, (ii) they employ particular *procedural* strategies and (iii) they also highlight their policy-relevance by means of elaborated *rhetorical* mechanisms. As graphically depicted in Figure 2 the three strategies are often enacted in a cascade-like form: Organizational or procedural strategies and mechanisms become transmission belts for SCL only – or at least primarily – if they are openly conveyed to a KBI's external audiences, i.e. if they are 'boosted' rhetorically. Rhetorical in this context does not imply that the underlying structures and procedures are 'faked', but rather that particular organizational and procedural features are framed in a specific way and are possibly highlighted and enhanced.

Figure 2: Strategies to support saliency, credibility and legitimacy

Our study concludes that KBIs employ such strategies to enhance their effectiveness in society and politics. Yet, our analysis also suggests that the three attributions of saliency, credibility and legitimacy are interdependent and have partly synergetic, partly antagonistic effects on the effectiveness of scientific policy advice. The societal relevance of a KBI, for example, can decrease when it doesn't have sufficient technical credibility and, with that, scientific authoritativeness is lost. But the different strategies to enact SCL also bear several trade-offs (see also Mitchell, Clark et al. 2006; Sarkki, Niemelä et al. 2013). For example, striving simultaneously for saliency and credibility can be difficult because it requires the balancing of partly opposing demands, namely that of policy-makers and that of the scientific community. Scientific advice in climate decision-making has to find a middle ground between the usability of the knowledge claims and scientific credibility. The effectiveness of scientific advice thus becomes a question of deliberate 'boundary work' (Gieryn 1995; Jasanoff 1987). KBIs blur the boundary between science and non-science when stressing their political vicinity and hence claiming their salience, but firmly draw the boundary between the two spheres when protecting their "authorative status as provider[s] of 'truths'" (Jasanoff 1987, 196).

(5) Options for improving science-policy interactions in Austria

The international analysis and comparison offered some examples that are suited for a small country like Austria and can serve as starting points for improved science-policy interactions in Austria:

- The Scottish CXC Call Down Service can serve as an inspiration for the networking of scientists as well as for short-term issue-specific advice that reacts fast to questions of daily politics. Participants highlighted the importance of the communication between scientific disciplines to make results relevant for climate policy. While small programmes such as StartClim offer some starting points more incentives for inter and transdisciplinary research or networking is perceived necessary. In this respect the CXC provides inspiration on how to foster networking between scientists and disciplines with the aim to provide societal and policy advice. The CXC also offers insights on how advisory institutions can react to short-term political questions and on the other side how politics and administration state relevant issues in a clear manner.

- The parliamentary lunch groups that are organized by the Swiss ProClim- serve as an impulse for scientific and particularly intermediary organizations (such as CCCA) to not only address administrative actors (as is currently often the case) but also to engage with new target groups such as parliamentary actors.

- Regional and collaborative approaches of knowledge brokerage (in particular the German KLIMZUG and the Dutch KfC) are particularly suitable approaches for the formulation and development of the provincial adaptation strategies. This could help to overcome the “federal phlegmatism” in climate policy. In general terms collaborative approaches of science-policy interactions have good preconditions in the Austrian political culture that often features a style of negotiation and consensus orientation between various actors groups. In this respect participants wished for a stronger role of environmental NGOs that so far are largely absent from important committees.

- The analyzed international cases have further demonstrated that there is much room for improvement in terms of transparency and visibility of climate policy advice in Austria. While the models of CCC and PBL as a whole are hardly transferable to the current Austrian context, their approaches to communicate and disseminate to politics but particularly the wider public could very well serve as impulses for more transparency in Austrian science-policy interactions. Here the very open disclosure and dissemination strategy of the CCC/ASC but also PBL’s approach to communicate uncertainties serve as examples for scientific institutions, intermediary organizations as well as politics and administration.

Besides these discussions on the more short- and medium term transferability of innovative KB approaches there are long-term and structural challenges for Austrian climate policy advice (see above)

B) Projektdetails

6 Methodik

In broad terms, ReSciPI applied a qualitative social science approach, including interviews, case studies and workshops. In the following the methods are described per work package.

WP1: Mapping of knowledge brokerage in Austrian climate policy

Methodologically WP1 relied on desk research, expert interviews and an interactive workshop with key actors. Desk research included the analysis of primary documents, such as federal laws and political strategy papers, and the review of academic works on Austrian climate policy and science-policy interaction. Subsequently, 24 qualitative semi-structured expert interviews with key actors at the science-policy nexus (incl. climate researchers, decision makers from politics and administration, societal stakeholders, and media professionals) were conducted between October 2011 and February 2012. The interviews were recorded, transcribed and analysed. The analysis and interpretation of the material was carried out on the basis of qualitative content analysis (Gläser and Laudel 2010), reducing and condensing the materials to statements that refer to deductively and inductively derived categories.

The results of the desk research and the interview series were discussed and validated in a first workshop that was held on 8 March 2012 at the University of Natural Resources and Life Sciences, Vienna. The workshop brought together 23 representatives of the above-mentioned actor groups as well as the members of ReSciPI's Advisory Board and aimed at encouraging an interactive and reflexive discourse on the strengths, weaknesses, potentials and obstacles for effective KB in Austria. The workshop combined plenary presentations and discussions in smaller groups.

WP2: Cross-national inventory of types of institutionalization of KB in climate policy

WP2 provided an overview on different (traditional but mainly new) forms and modes of KB in various industrialized countries. The overview encompassed a systematic survey of 30 knowledge brokerage institutions (KBIs) in eleven OECD countries. The sample of KBIs was selected in a multi-stage procedure. As a starting point, a list of roughly 100 traditional as well as innovative formats of climate policy advice in 15 OECD countries, the European Union and at the international level was compiled by desk research and was further extended with the support of the members of the project's Advisory Board. The set of potential cases was then reduced to about 40, for which we drafted short profiles using a standardized form. In a second selection step, we condensed the number of cases to the final 30 cases. The selection followed the strategies of stratified purposeful sampling and cluster sampling (Patton 1990) and was driven by four main considerations:

(1) Type of KBI: The sample encompasses different types of knowledge brokerage institutions that can be grouped into four basic forms of institutionalization: research institutions engaged in KB activities, scientific advisory bodies, scientific advisory processes and information exchange platforms.

(2) Problem areas: We strove for a balanced representation of KBIs with a focus on mitigation and adaptation (policy), either with a comprehensive or more specific focus therein (e.g. energy, adaptation of coasts), including cases where climate change is just one among several environmental or sustainability issues addressed.

(3) Innovativeness: We were particularly interested in new, innovative forms of scientific policy advice and hence the majority of our cases classifies as such. However, we also deliberately selected some more traditional, typically more unidirectional KBIs.

(4) Relevance: We have deliberately chosen those KBIs that exhibit a certain relevance and visibility in their respective country and beyond.

For the final 30 cases, we compiled systematic *case profiles* (see Reinecke, Bauer et al. 2013) based on literature review, document analysis and telephone interviews with on average one key informant per case. The case profiles cover the following main dimensions: (1) general features (including type, thematic focus, constitution and objectives), (2) institutionalization (including organizational set up, funding, reporting and evaluation), (3) knowledge brokerage setting (including brokerage activities, outputs and target groups), and (4) the effectiveness of the KB case. The case profiles were drafted by one researcher and checked by two other researchers in order to guarantee coherence and completeness across all profiles. The analytical dimensions have partly been derived deductively from the respective literature and have partly been inductively developed and iteratively re-adjusted based on the rich empirical material during the research process. In the data analysis, we have deliberately foregone an overly quantifying approach and have opted for a form of presentation in which the most significant patterns are introduced and described. This approach corresponds better to the size of the sample and the qualitative, interpretive form of data analysis which impairs giving statements about representativeness or regularities.

WP3: In-depth analysis of selected innovative KB institutions

The in-depth study followed a qualitative case study approach (George and Bennett 2005). Building on the stock-taking of 30 KBIs in WP2, nine particularly insightful cases were selected for further in-depth analysis (see Table 6). The selection criteria included: variance on the forms of institutionalization (i.e. research programs, research institutes, and advisory services), thematic focus (including advice on mitigation and adaptation), their innovativeness (in terms of institutionalization or activities) and their relevance for and visibility in climate policy in their respective countries. In addition, we decided to concentrate on four countries (i.e. Germany, the Netherlands, Switzerland and the UK) to be able to carve out how a country's socio-political context influences science-policy interactions (Jasanoff 1986; Jasanoff 2005; Jasanoff 2012; Renn 1995).

In order to gain in-depth insights into the activities of the selected KBIs and trace their actual influence in political and societal decision-making, we selected and analysed 2-4 prominent *exemplary activities* per case. The selection of the exemplary activities drew on their representativeness for the KBI (i.e. the activity belongs to the core activities of the KBI), the activity's innovativeness in terms of science-policy interactions (for example particularly interactive or participatory approaches), and the variety of KB activities. Exemplary activities differ in type, size and duration and include complete projects, KB studies, core services and functions of the KBI and specific products. Table 6 lists the analysed KB institutions and exemplary activities. The KBIs are listed per country in chronological order of their initiation.

Table 6: List of cases of knowledge brokerage institutions and activities studied in WP3

Country	KB institution	Exemplary KB activities
Germany	*PIK*	1. Personal policy advice 2. Commissioned Reports 3. Climate Impacts Online portal 4. Engaging civil society in low carbon scenarios
	KLIMZUG	1. Roadmap of Change 2. Piloting resilient urban development 3. RADOST-Tour – Baltic Sea Coast 2100
	CSC	1. „Klimanavigator“ platform 2. Climate signal maps 3. Climate fact sheets 4. Adaptation planning support in regions
Netherlands	*PBL*	1. Exploration of Pathways towards a Clean Economy by 2050 2. IMAGE 2.4 3. Assessing an IPCC Assessment
	KfC	1. Hotspot Haaglanden Region 2. Hotspot Rotterdam Region 3. Theme 7 – Governance of Adaptation 4. Theme 8 – Decision Support Tools
Switzerland	*ProClim-*	1. OcCC – Organe Consultatif sur les Changements Climatiques 2. Parliamentary Group “Climate Change”
United Kingdom	*UKCIP*	1. ARCC Coordination Network 2. Local Climate Impact Profile - LCLIP 3. Communicating the United Kingdom Climate Projections - UKCP09
	CCC	1. Setting and monitoring the UK carbon budgets (CCC) 2. Progress reports on adaptation policies (ASC)
	ClimateXChange Scotland, CXC	1. Call down service 2. Informing the Scottish Adaptation Programme 3. Aligning science to policy: Policy Milestones

The case studies of KBIs and exemplary activities drew on document analysis and interviews. Analysed documents encompassed, for instance, strategic documents and reports of the KB institutions (e.g. annual work programs, evaluation reports), public relations documents (e.g. mission statement, website, press relations) and project reports (especially of the selected exemplary activities). The insights from the document analysis were iteratively extended and enriched with information from qualitative semi-structured expert interviews (Bogner, Littig et al. 2009). Around three to nine interviews were conducted for each of the nine KBI cases, 51 interviews in total. Interviews were conducted face-to-face and by telephone or Skype. The interviewees included experts at the strategic level of the KBI (e.g. the director, executive director, general secretary, chair of steering committee), experts of the KBI prominently involved in the selected exemplary activities (e.g. project leaders, senior researchers); representatives of ministries and other branches of government, other ‘customers’ (e.g. administrative representatives in regions or municipalities involved in exemplary activities either as commissioners and/or involved stakeholders). All interviews were tape-recorded and transcribed. Afterwards, the interviews were interpreted by means of qualitative methods of content analysis (Kohlbacher 2006; Mayring 2000) partly deductively along a set of predefined analytical dimensions and assessment criteria and partly inductively. In broader terms, three dimensions guided the analysis and comparison of the cases: The politico-cultural and policy-specific context of the respective KB institution, the KB activities, including interactions with customers or addressees, and the effectiveness of the KBI and the selected exemplary activities in terms of saliency, credibility and legitimacy.

WP4: Synthesis and policy–relevant conclusions for effective knowledge brokerage in Austrian climate policy

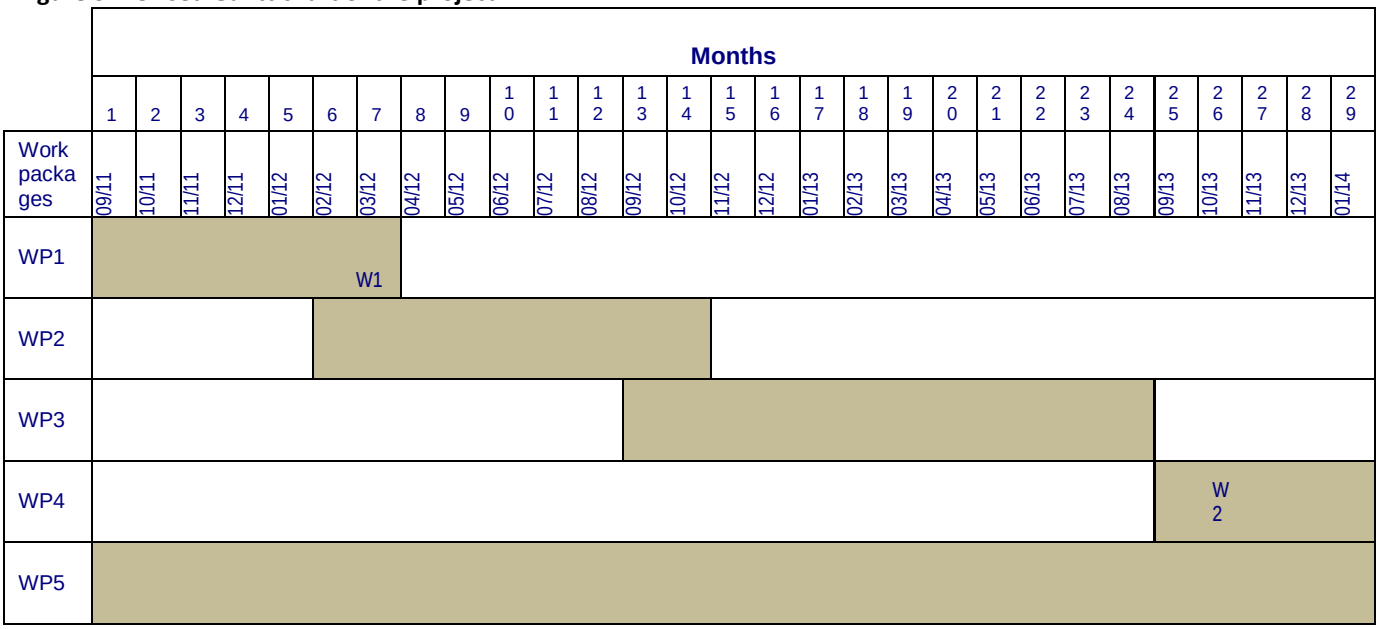
As a first step the research was synthesized in a concise policy brief that discussed innovative knowledge brokerage institutions and activities and their relevance for the Austrian context. The policy brief served as a preparation for the second workshop that was held on 3 October 2013 at the University of Natural Resources and Life Sciences, Vienna. Representatives of science, intermediary organisations and administration as well as members of ReSciPI's Advisory Board discussed the results and their transferability to Austria. The discussion and reflection in the workshop served the usability and robustness of the research results. The workshop went beyond the 'classical' unidirectional presentation of results by providing possibilities for structured deliberation in which the different actors had the chance to enter a dialogue from their different professional perspectives. This continued dialogue enabled participants to identify opportunities and challenges for science-policy interactions in Austria that are of relevance in their every-day work, be it as scientists, political or administrative decision-makers.

In addition, we synthesized our results by a country comparison, starting with a comparison of Austria, the Netherlands and Switzerland because these three countries share a strong neo-corporatist culture. By this comparison we aimed to learn more about the opportunities and challenges of knowledge brokerage against the background of the political culture of a country.

7 Arbeits- und Zeitplan

The project ran over 29 months from September 2011 till January 2014. The single work packages (with the exception of WP5 that covered management and dissemination) were processed sequentially with slight overlaps (see Figure 3 for the duration of the single work packages). In March 2012 the first workshop was held and in October 2013 the final workshop was held.

Figure 3: Revised Gantt chart of the project



[W1 and W2 indicate the dates of the two workshops]

8 Publikationen und Disseminierungsaktivitäten

Website and brochure

- ReSciPI website
  - German: http://www.wiso.boku.ac.at/rescipi.html
  - English: http://www.wiso.boku.ac.at/rescipi.html?&L=1
- Project folder, see http://www.wiso.boku.ac.at/fileadmin/_/H73/H732/ReSciPI/ReSciPI_folder.pdf.

Research reports and discussion papers

- Hermann, A.T., A. Bauer, M. Pregernig, S. Reinecke, K. Hogl and T. Pistorius (2012): Die Interaktion von Wissenschaft und Politik in der österreichischen Klimapolitik, InFER discussion paper 01/2012.
- Reinecke, S., A. Bauer, M. Pregernig, A.T. Hermann, T. Pistorius and K. Hogl (2013): Scientific climate policy advice: An overview of national forms of institutionalization; InFER discussion paper 2/2013.
- Reinecke, S., A.T. Hermann, A. Bauer, M. Pregernig, K. Hogl and T. Pistorius (2013): Innovative climate policy advice: Case studies from Germany, the Netherlands, Switzerland and the UK. InFER research report 1/2013.
- ReSciPI Policy Brief: Gut beratene Klimapolitik? Innovative Modelle wissenschaftlicher Klimapolitikberatung, September 2013.
- These publications can be downloaded from: http://www.wiso.boku.ac.at/infer/forschungsprojekte/rescipi/publikationen/.

Journal articles (accepted, submitted and in preparation)

- Pregernig, M. (forthcoming): Framings of science-policy interactions and their discursive and institutional effects – examples from conservation and environmental policy, accepted for publication in Biodiversity & Conservation.
- Hermann, A.T., M. Pregernig, K. Hogl and A. Bauer (forthcoming): Cultural Imprints on Scientific Policy Advice: Climate Science-Policy Interactions within Austrian Neo-Corporatism, submitted to Environmental Policy and Governance, revised, awaiting final decision.
- Hermann, A. and K. Hogl (forthcoming): An In-depth Account of Textbook Advisory Arrangements: Science-policy Interactions in Austrian, Dutch, and Swiss Climate Policy, submitted to Science and Public Policy, in review.
- Bauer, A., M. Pregernig and S. Reinecke, (forthcoming): Towards effective climate policy advice: Institutional strategies to create saliency, credibility and democratic accountability; to be submitted in autumn 2014. (draft)
- Reinecke, S., M. Pregernig and A. Bauer (forthcoming): Knowledge brokerage: Taking stock of scientific policy advice on climate change, to be submitted in Spring 2015. (draft)

Presentations at external events and outreach (conferences and workshops)

- Hermann, A.T. (2012): Mediated and informal processes of science-policy interaction- the Austrian way of climate policy, 24th Ph.D. Workshop on International Climate Policy, 03-04 May 2012, Freiburg, Germany.
- Hermann, A.T., A. Bauer, M. Pregernig and K. Hogl (2012): Science-Policy Interactions in a Neo-corporatist System: Knowledge Brokerage in Austrian Climate Policy, 2012 Berlin Conference on the Human Dimensions of Global Environmental Change 'Evidence for Sustainable Development', 05-06 October 2012, Freie Universität Berlin, Germany.

- Pregernig, M., S. Reinecke and A. Bauer (2012): Beyond the edge of the board: typology and assessment of innovative forms of knowledge brokerage in climate policy. 2012 Berlin Conference on the Human Dimensions of Global Environmental Change 'Evidence for Sustainable Development', 05-06 October 2012, Freie Universität Berlin, Germany.
- Reinecke, S., M. Pregernig, T. Pistorius and A. Bauer: Gut beratene Klimapolitik: Internationale Bestandsaufnahme zu Formen der wissenschaftlichen Politikberatung in der Klimapolitik, 9. Deutsche Klimatagung, 09-12 October 2012, Albert-Ludwigs-Universität Freiburg, Germany.
- Bauer, A., M. Pregernig and S. Reinecke (2013): Gut beraten? Internationaler Überblick zu Formen wissenschaftlicher Beratung in der Klimapolitik. 14. Österreichischer Klimatag, 04-05 April 2013, University of Natural Resources and Life Sciences, Vienna (BOKU), Austria.
- Pregernig, M. (2013): What's the problem? Theoretical folktales about ineffective science-policy interactions – the case of forest conservation, keynote presentation at the interdisciplinary workshop on "Perspectives on Forest Conservation: Tackling the Frontier between Policy and Conservation Science", 19-21 June 2013, Albert-Ludwigs-University Freiburg, Germany.
- Reinecke, S., M. Pregernig M. and A. Bauer (2013): Knowledge brokerage: Taking stock of scientific policy advice on climate change. 1st International Conference on Public Policy (ICPP), 26-28 June 2013, Grenoble, France.
- Bauer, A., M. Pregernig, S. Reinecke, and A.T. Hermann (2013): Towards effective climate policy advice: Institutional strategies to create saliency, credibility and legitimacy.1st International Conference on Public Policy (ICPP), 26-28 June 2013, Grenoble, France.
- Hermann, A. T., K. Hogl, A. Bauer, A. and M. Pregernig (2013): Same same but different: Scientific climate policy advice in neo-corporatist systems. 1st International Conference on Public Policy, 26-28 June 2013, Grenoble, France.
- Reinecke, S., A. Hermann, M. Pregernig and A. Bauer (2013): Institutionalization and enactment of interactive science-policy advice: Results of an international survey and in-depth case studies in the field of climate policy .8th International Interpretive Policy Analysis Conference (IPA) 2013, 3-5 July 2013, Vienna, Austria.
- Bauer, A. and M. Pikl (2013): The use and portrayal of scientific expertise in climate change coverage in Austrian newspapers. Science in Public Conference 2013 - Critical Perspectives on Making Science Public, 22-23 July 2013, Nottingham, United Kingdom.
- Hermann, A.T., M. Pikl and A. Bauer (2013): On alerters, analysts, and critics: The roles of researchers in Austrian newspapers. Science in Public Conference 2013 - Critical Perspectives on Making Science Public, 22-23 July 2013, Nottingham, United Kingdom.
- Hermann, A.T., K. Hogl, A. Bauer and M. Pregernig (2013): Scientific climate policy advice in neo-corporatist systems. [Poster] Vienna Workshop on Sustainable Development, 20 November, 2013, Vienna, Austria.
- Reinecke, S. (2014): Taming the climate monster for policy. Climate Service Centres in Germany and the UK. Colloquium of the Institute for Forest and Environmental Policy, 07 February 2014, University of Freiburg, Germany.
- Hermann, A.T., A. Bauer, M. Pregernig, S. Reinecke, K. Hogl and T. Pistorius (2014): Gut beratene Klimapolitik? International Innovationen und Schlussfolgerungen für Österreich, 15. Österreichischer Klimatag 2014, 03-04 April, Innsbruck, Austria.
- Bauer, A., A.T. Hermann and S. Reinecke: Between Exclusion and Dialogue: Scientific Policy Advice and Climate Change Skepticism, Changing Climate Change Communication Conference, 21 - 22 July 2014, VU University Amsterdam, the Netherlands.
- Hermann, A.T., A. Bauer and S. Reinecke: Toward digital climate change communication: Dissemination strategies of scientific advisory institutions, Changing Climate Change Communication Conference, 21 - 22 July 2014, VU University Amsterdam, the Netherlands.

Master theses

- Markus Pikl (2012): Klimawandel und Klimawissenschaft in der Berichterstattung österreichischer Tageszeitungen, submitted in November 2012 at the University of Natural Resources and Life Sciences, Vienna (BOKU), supervised by Karl Hogl and Anja Bauer.
- Daniel Pinillos (2013): Interactions between climate science and climate policy in Australia: Analysis of two boundary organizations, submitted in January 2013 at the University of Freiburg, supervised by Michael Pregernig and Till Pistorius.

Teaching

The topics and insights of ReSciPI were utilized in the teaching at BOKU as well as the University of Freiburg:

- University of Natural Resources and Life Sciences, Vienna (BOKU): VS ‚Wissenschaftliche Assessments im Ressourcenmanagement' [Scientific Assessments in Resource Management], winter terms 2012/13; 2013/14; summer term 2014
- University of Freiburg: ‚Global Environmental Change', winter term 2013/14; Internationale Politik und Märkte [International Policy and Markets] summer terms 2013, 2014.

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