A literature and practice review for the Research–Policy Project: Knowledge co-production milestones 1 & 2

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Introduction

This literature and practice review is to inform the development of the Research–Policy Project (Victorian Centre for Climate Change Adaptation Research project 'Examining and improving co-production of knowledge between research and policy: learning from VCCCAR').

The Research–Policy Project is examining and testing approaches to engagement between researchers and policy makers in evidence-informed policy development, specifically in the context of VCCCAR-funded climate change adaptation research projects, (but also including reference to other policy influencing organisations, e.g. the National Climate Change Adaptation Research Forum, and the UK Overseas Development Unit) with the aim of designing co-production activities.

We are focusing on VCCCAR research projects to:

- identify effective knowledge co-production in policy development by researchers, VCCCAR and policy makers
- describe and analyse approaches to researcher–policy maker interaction, understand the nature and impact of these interactions, and identify strengths and weaknesses of these approaches
- undertake a deep-dive case study analysis of four VCCCAR projects that are considered to be effective in knowledge co-production and policy impact
- facilitate improvements in research-informed policy and dissemination based on the knowledge cogenerated in the course of this project.

The aims of this review are to:

1. Examine the literature on research-into-policy and identify recent developments in research supply, policy demand and the research–policy environment overall, in Australia and internationally

2. Review best practice research-into-policy activities in a range of policy-influencing organisations identified by project participants:

- Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia
- Grattan Institute, Australia
- Institute for Social Science Research (ISSR), Policy cluster, University of Queensland, Australia
- National Climate Change Adaptation Research Facility (NCCARF), Australia
- Ouranos (Consortium on Regional Climatology and Adaptation to Climate Change), Canada
- Overseas Development Institute (ODI), United Kingdom.

3. Develop a work in progress to inform the next stages of the Research–Policy Project and to provide project participants with knowledge about concepts and practice in this space.

Literature review on research-into-policy

This review examines the literature on research-into-policy to identify recent concepts in research supply, policy demand and the research–policy environment overall.[1] The review is limited to recent developments (since 2000) because this coincides with recent international interest and activity in evidence-based policy development (e.g. Bogenschneider and Corbett 2010) and interrogation of the role of research and researchers in policy and politics (e.g. Pielke 2007).

In Australia, research-into-policy is widely regarded 'a good thing' with enthusiastic interest; for example, a 2012 Australian Public Service report claimed that the APS is:

> … increasingly tasked with solving complex policy problems that require significant input from [research] in order to address them fully and appropriately. Policy making within the APS needs to be based on a rigorous, evidence-based approach that routinely and systematically draws upon [research] as a key element (DoI 2012, p. iii; the word 'science' has been replaced by 'research' as a more inclusive term for the systematic production of knowledge and evidence)

An Australian Productivity Commission roundtable in 2009 on 'Strengthening Evidence-Based Policy in the Australian Federation' discussed evidence-based policy principles, reviewed Australian research-into-policy practice, and considered ways to improve the availability of evidence and institutional arrangements to 'embed good use of evidence more firmly into policy-making'.[2]

There are ongoing research projects investigating 'processes, practices and circumstances that facilitate or hinder the uptake and adoption of academic social research within policy contexts'.[3] Perhaps ongoing critique of this notion is also warranted, such as that provided by Marston and Watts (2003) in their investigation of evidence-based policy making in which they interrogated the evidence claims, arguments and assumptions made in a case study on juvenile crime. They demonstrated that what constitutes 'evidence' is also negotiated in the context of any given research-into-policy activity, such that:

> …policy-makers and researchers [must] remain 'context sensitive' about the sorts of research methodologies and the types of evidence best suited to different circumstances. Meeting these conditions will not guarantee that research and other forms of evidence will triumph over politics and a range of other inputs into policy, but they will at least increase the prospect of a more democratic and less simplistic conceptual and practical relationship between evidence and policy outcomes (p. 160).

The aim of the present review is to provide research participants with knowledge about research-into-policy in Australia and elsewhere, and to inform the subsequent phases of the Research–Policy Project in which researchers and policy makers will be interviewed to elicit their views on research-into-policy (particularly, although not exclusively, in regard to VCCCAR projects), and capacity-building interventions designed.

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[1] Some sections are based on a literature review on knowledge transfer developed by Jordan Gregory for the Department of Environment and Primary Industries.
[2] www.pc.gov.au/research/conference-proceedings/strengthening-evidence
[3] See, for example, the 'Utilisation of Social Science Research in Policy Development and Program Review' website: www.issr.uq.edu.au/ebp-home

Research-into-policy

We have used 'research-into-policy' here to mean any process or activity that leads to policy development that is 'evidence-informed'. This occurs along a spectrum from passive dissemination to active and engaged knowledge co-production (or co-production) by researchers, policy makers and stakeholders/end-users, or some combination of these actors. In some cases, research is used to provide decision-makers with background information to assist their deliberations, and in other cases, research might facilitate a social learning process. It is difficult to assess how often research leads to a policy outcome, since there are many variables associated with final policy decisions.

Figure 1 shows a simple diagram of the Australian policy cycle, which is provided here as it was in the original source as 'a useful organising device for conceptualising the process' rather than a comprehensive representation of the real world (DoI 2012). Research-into-policy might occur at any stage or at multiple stages in the policy cycle, or where the arrows are located in Figure 1, such as between Anticipation and Formulation.

Figure 1   The Australian policy cycle

Anticipation

Identifying issues and agenda setting

Formulation

Information gathering and analysis

Evaluation

Assessing effectiveness and impact

Consultation

Testing policy options through consultation

Adoption

Decision-making and implementation
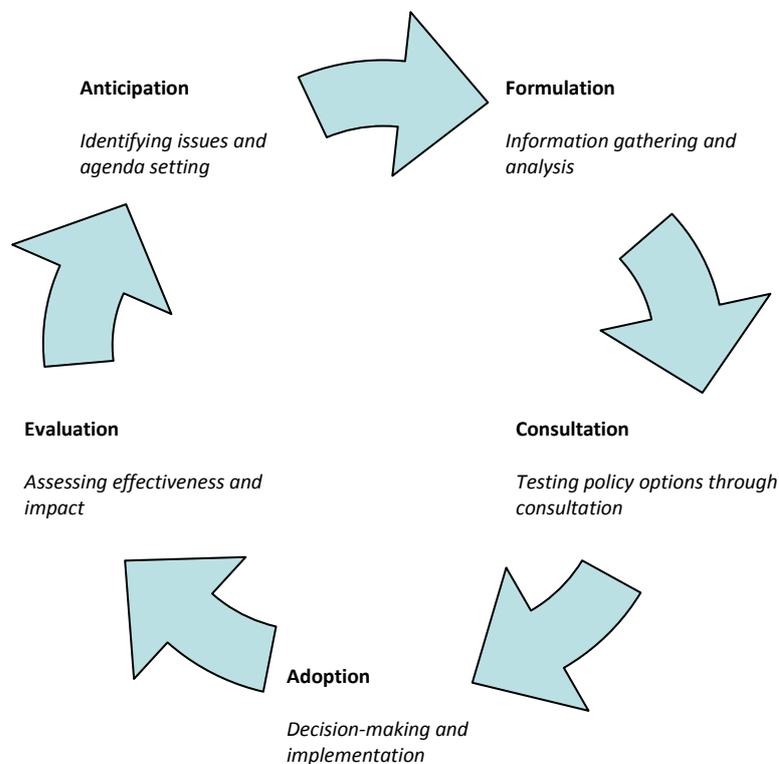
Source: DoI (2012, p. 8).

One important component of research-into-policy is co-production of knowledge. Knowledge co-production may involve individuals or teams; for example, researchers, policy-makers, knowledge brokers (Head 2010a); policy entrepreneurs (Meijerink and Huitema 2010) or boundary organisations (Guston 2001) working together to produce research outputs that are salient, credible and legitimate (Cash et al. 2002) so that uptake and use are more likely:

- salient — relevant to decision making bodies or publics (answers germane questions, is timely and accessible, etc.)

- credible — authoritative, believable and trusted
- legitimate — produced in a fair manner, which considers appropriate values, concerns, and perspectives of different actors.

Cash et al. (2002) suggest that researchers have too often elevated knowledge credibility at the expense of salience and legitimacy, which are important to policy-makers and other stakeholders. Other trade-offs may occur, depending on context and which aspects of outputs are in the ascendant.

There is a particular emphasis on knowledge co-production in the present review, as it is identified as best practice in research-into-policy by some scholars (e.g. Murdock et al. 2013), and this view is shared by policy makers involved in our project. This project has been developed in close collaboration with VCCCAR and its stakeholders and this process has resulted in a reflexive action research project that is itself an example of co-production.

One finding of the VCCCAR evaluation that took place in July 2012 was that knowledge transfer of VCCCAR research project outputs needed to be improved. This is interpreted in the present project as both the subject of research — what knowledge transfer has occurred, what has/not worked in which contexts — and a call for best practice in research-into-policy across the spectrum, but with an emphasis on knowledge co-production. Research centres such as VCCCAR have been shown to be effective in collaborative knowledge transfer efforts (e.g. Lavis et al. 2003; Hegger et al. 2012) and universities are also beginning to focus on knowledge transfer or 'research impact' as part of their public accountability (in Australia, this is manifested in the proposed development of a university-focused research impact assessment mechanism).[4]

Challenges and strategies to overcome them

When people talk about research-into-policy, they commonly use a bridge metaphor, as in 'bridging the gap' between research and policy development. This metaphor is useful to consider push/supply and pull/demand factors, when research and policy are considered to be 'parallel universes' (as discussed in Stone 2009 and Prewitt et al. 2012). Prewitt et al. (2012) summarise the 'two communities' thus:

> On the supply side are researchers who fail to focus on policy-relevant issues and problems, cannot deliver research in the time frame generally necessary for effective policy making, do not relate findings from specific studies to the broad context of a policy issue, ineffectively communicate their findings, depend on technical arguments that are inaccessible to policy makers, and lack credibility because of perceived career interests or even partisan biases. On the demand side are policy makers who fail to spell out objectives in researchable terms, have few incentives to use science, and do not take time to understand research findings relevant to pending policy choices (p. 43).

These common complaints reflect a range of challenges to be overcome for more effective research-into-policy; these are shown in Table 1, along with best-practice strategies (at the engagement end of the spectrum, including knowledge co-production) to improve research-into-practice, which need to at least partly address these challenges on multiple fronts (Weichselgartner and Kasperson 2010).

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[4] See www.innovation.gov.au/research/Pages/AssessingWiderBenefits.aspx

Table 1 Research-into-policy challenges and strategies to overcome them

	Challenges	Strategies
Culture	Dissimilar, even conflicting, values, jargon, priorities and processes (Argote and Ingram 2000, Head 2010b, Lemos and Morehouse 2005, Goh 2002, Clarke and Holmes 2010), which leads to a lack of trust and poor communication	Promote integration and stakeholder participation (Amaru and Chetri 2013), with collaboration and the development of cultures of practice, and the support of senior management (Head 2010a, Goh 2002, Lavis et al. 2003, Clarke and Holmes 2010)
Institutions/ organisations	Effective processes and decision-making processes are lacking (Mitton et al. 2007, Young et al. 2002), incentives and disincentives are embedded in structures (Clarke and Holmes 2010) and research is only one of many inputs in an organisational context that favours generalised and simplified knowledge, linear modes of knowledge transfer (Majdzadeh et al. 2008)	Tailor institutional processes and structures so that they are fit for purpose (Amaru and Chetri 2013, Argote and Ingram 2000), develop specialist knowledge brokerage roles (Head 2010a) or roles for policy entrepreneurs (Meijerink and Huitema 2010), interchange or co-locate personnel (Argote and Ingram 2000, Majdzadeh et al. 2008), identify stakeholders and communication pathways with institutional mapping (Stringer and Dougill 2013), host forums and networking events (Head 2010a, Weichselgartner and Kasperson 2010)
Skills and communication	Researchers lack appropriate communication skills and policy-makers lack an understanding of research (Cash et al. 2003), which leads to an unwillingness to act (Brooker and Young 2006)	Build capacity and develop knowledge transfer skills in researchers and policy-makers (ATNU 2006, Brooker and Young 2006, Lavis et al. 2003), through coaching, workshops, collaborative tools, and cross-sectoral engagement and interaction (Price et al. 2012), tailor research outputs appropriately for a policy audience (Clarke and Holmes 2010)
Knowledge dissemination	Explicit and tacit knowledge is produced (Goh 2002, Argote and Ingram 2000), but is not disseminated at all or is supplied in a format inappropriate for use (Klenk and Hickey 2011); for example, passive dissemination without interaction or engagement (Lavis et al. 2003)	Consider knowledge credibility, salience and legitimacy at all stages (Cash et al. 2003), use decision-support tools to aid the decision-making process to increase transparency, reproducibility and robustness (Liu et al. 2012), and put in place knowledge-transfer requirements (e.g. in funding processes; Lavis et al 2003) that go beyond passive dissemination
Expectations	Researchers and policy-makers differ in their needs, understandings of the research and policy processes, and priorities, resulting in unintended use (Hegger at al. 2012) or no use (Young et al. 2002)	Enable researchers and policy-makers to collaborate in setting the research agenda from the beginning (Hegger et al. 2012) to create realistic shared expectations about organisational processes, research use and the form of research outputs (Lemos and Morehouse 2005)
Resourcing	A lack of time, money and contexts within which to make the effort on the part of researchers and policy-makers (Argyriou et al. 2012, Head 2010a, Klenk and Hickey 2011, Lavis et al. 2003, Lemos and Morehouse 2005); thus, trust and relationships suffer	In a context of limited resources, is pays to prioritise knowledge transfer because doing so can lead to a culture shift and a virtuous cycle of research-into-policy (Lavis et al. 2003)

Overcoming barriers to research-into-policy is an exercise in ensuring that time, effort and resources, financial and intellectual, are not wasted.

Research use

Bridging the gap is not the only way to think about research-into-policy. Research outputs — evidence — needs to be salient, credible and legitimate (Cash et al. 2002) to have a chance of uptake and use, but what does 'use' mean, how can we recognise it, and what are the barriers and enablers for use (i.e. beyond knowledge transfer)?

Nutley at al. (2007) locate conceptual uses (indirect influence on knowledge, understanding and attitudes) and instrumental uses (direct application) of research along a spectrum ranging from 'simply raising awareness of research findings, through enhanced knowledge and understanding and shifts in attitudes and ideas, to direct changes in policy and practice' (p. 51). They also discuss 'more symbolic, strategic or process forms of use that are less concerned with the content of the research and may emerge from conducting the research itself' (p. 58).

An example of the latter is demonstrated in a study by Yuen et al (2013), which examined technical assessments of vulnerability and/or risk in south-eastern Australia to find out if they were used as intended; that is, to inform directly adaptation planning. They found that the assessments were only one outcome of the exercise and recommended that practitioners should consider that getting together, sharing knowledge and ideas, debating and deliberating over actions are important for communities to take action: 'vulnerability assessments provide the platform upon which social learning can occur and are of value irrespective of whether assessments are able to prescribe optimal management responses or provide objective information' (p. 585).

In addition, research use may be linear or unpredictable, with impacts that are immediate or that follow a time lag, and 'knowledge is likely to be actively interpreted and negotiated within the contexts of its use' (Nutley at al. 2007, p. 59).

Barriers and enablers to the use of research summarised by Nutley et al. (2007, pp. 81–83) include various aspects of the:

- nature of the research
- personal characteristics of researchers and potential research users
- links between research and its users
- context for use of research (see also Contandriopoulos et al 2010, who also emphasise critical importance of context).

Finally, Nutley et al. (2007) conclude that 'interactive and social approaches seem to offer the most promise' for enhancing the use of research — included in these approaches are partnerships (formal or informal) between researchers, policy-makers and other stakeholders; forums in which to discuss and debate research, policy and practice; and acknowledgement of the social and collective nature of the research and policy processes leading to culture and structural change (pp. 305–306).

As a transition between this review of the literature and the following practice review, Box 1 describes an assessment of ongoing research-into-policy activities in the governance of

environmental management in the Great Barrier Reef. It is of interest here in the interface between ideas about research-into-policy and research-into-policy practice.

Box 1   Ongoing and negotiated collaboration and co-production in the Great Barrier Reef

Recently, a CSIRO research project 'Using knowledge to make collaborative policy-level decisions in Australia's Great Barrier Reef' (Robinson et al. 2010) examined the challenge (due to complexity and fragmentation) of the governance of environmental management in the Great Barrier Reef. It focused on the boundary work carried out by collaborating institutions at the policy level. The research objectives were to 'summarise the characteristics of institutional collaboration focused on policy-level decision-making, and to identify the critical factors which facilitate or impede knowledge-sharing for policy change and implementation' (p. vi). It found the following:

- That formal collaborative partnerships between government and non-government organisations shared the common objectives to 'generate, share and negotiate knowledge' of various types (not just scientific); to 'influence, change, test and refine policy'; and to collaborate on operational matters — many were required to include a range of stakeholders and involved substantial investment of time and resources.
- That shorter term informal collaborative networks could be effective if they had the 'capacity to quickly access the political level of government and to broker a mix of political, technical and bureaucratic knowledge for policy-level change' (p. vi) — these collaborations formed quickly and disbanded once change had been effected.
- That legitimacy and credibility of knowledge were the focus of the first point above and salience of knowledge was the focus of the second point (see Cash et al. 2002 as discussed earlier regarding legitimacy, salience and credibility as attributes of knowledge favoured in different kinds of boundary work, with trade-offs between them.

Examples of co-production included agreeing targets, aligning activities, sourcing investment, establishing multilateral monitoring programs (Robinson et al. 2010, p. 9, Table 4) and knowledge transfer; for example, 'sharing, negotiating and co-producing policy-relevant information' (p. 22). Thus in this context, collaboration and co-production of knowledge — its negotiation and creation by all stakeholders — can be effective in the short and long term. Critically, is *ongoing, shifting and opportunistic*. The authors also suggest that these collaborative approaches are an 'ongoing experiment in the context of democratic governance' (p. vii).

The implications for the present project are that the focus on the engagement end of the research-into-policy spectrum (and on co-production) is warranted in both the VCCCAR projects we are examining and in our own practice of research. However, as we move towards the engagement end of the spectrum, our activities become more resource intensive.

Review of research-into-policy in practice

A desktop survey of the activities and publications of relevant selected research institutions and boundary organisations (Table 2) was carried out to inform the development of the Research–Policy Project. Criteria for inclusion in the review are discussed below. The aim of this survey was to provide the research participants with information about the ways that these organisations, to greater or lesser degrees, achieve their research-into-policy aims and cogenerate knowledge.

Table 2 Organisations included in the survey of research-into-policy in practice

	Description of remit for research-into-policy
Commonwealth Scientific and Industrial Research Organisation (CSIRO) Science into Society research group CSIRO Land and Water www.csiro.au	1) The functions of [CSIRO] are: (a) to carry out scientific research for any of the following purposes: (i) assisting Australian industry; (ii) furthering the interests of the Australian community; (iii) contributing to the achievement of Australian national objectives or the performance of the national and international responsibilities of the Commonwealth; (iv) any other purpose determined by the Minister; (b) to encourage or facilitate the application or utilization of the results of such research…
Grattan Institute grattan.edu.au	Grattan Institute is an independent think tank dedicated to developing public policy for Australia's future. It runs six policy programs: Cities, Energy, Health, Higher Education, School Education and Productivity Growth, as areas where 'fact-based analysis and lively debate can change the minds of policy makers and the public'.
Institute for Social Science Research (ISSR), Policy cluster, University of Queensland www.issr.uq.edu.au/cluster/policy	The ISSR aims to improve economic and social wellbeing for individuals, households, communities and regions in Australia and internationally. The Policy cluster takes in work in all other clusters. All research in the Institute seeks to contribute directly or indirectly to understanding, informing and influencing policy. Much of this is applied and problem-oriented and aimed at evaluating the effectiveness, affordability and viability of policies.
Monash Sustainability Institute (MSI), Monash University monash.edu/research/sustainability-institute	The MSI is a multidisciplinary, cross-faculty institute that delivers solutions to key climate change and sustainability challenges through research, education and action.
National Climate Change Adaptation Research Facility (NCCARF) www.nccarf.edu.au/nccarf	NCCARF aims to harness and coordinate the capabilities of Australia's researchers, to generate and communicate the knowledge decision-makers need for successful adaptation to climate change. The Facility is a Partnership between the Australian Government Department of Climate Change and Energy Efficiency and Griffith University, with a consortium of funding partners drawn from across the country.
Ouranos (Consortium on Regional Climatology and Adaptation to Climate Change), Canada www.ouranos.ca/en	Ouranos is a network of some 400 scientists and professionals working across Quebec, Canada and internationally, on issues of public safety and secure infrastructures; energy supply; water resources; health; forestry, agricultural, mining, tourism and transportation operations; and protecting the natural environment
Overseas Development Institute (ODI), United Kingdom www.odi.org.uk	ODI's mission is to inspire and inform policy and practice which lead to the reduction of poverty, the alleviation of suffering and the achievement of sustainable livelihoods in developing countries … by locking together high quality applied research, practical policy advice, and policy-focused dissemination and debate … [working] with partners in the public and private sectors, in both developing and developed countries.

Source: Organisation websites.

Methodology and limitations of the desktop survey

The desktop survey was of the organisations' websites (Table 2) to collect basic information on each organisation's vision or objectives in regard to research-into-policy aspirations. The organisations were selected to include at least two of the following: focus on climate change adaptation, stated research-into-policy activity (particularly knowledge co-production), boundary work and/or knowledge brokerage, and a research network or consortium structure. The two non-Australian organisations were chosen due to their best-practice reputation (Overseas Development Institute) and both research focus and structure as a consortium that includes researchers, policy-makers and end-users (Ouranas).

Publications and programs available on organisational websites were analysed for the methods and activities undertaken to fulfil stated research-into-policy aspirations, including a focus on the co-production of knowledge between researchers and policy-makers. Finally, a search of the academic literature on the organisation name linked with policy keywords was conducted, with the aim of including the research perspective. This was not an exhaustive survey as the aim was to provide a summary of the state of play in research-into-policy activities, in order to inform the next stage of the project.

Limitations of this desktop survey included:

- reliance on the organisations' websites, since details of research-into-policy activities are often minimal
- the dearth of publications about research-into-policy activities that are legitimate and credible
- a general lack of publically available program monitoring and evaluation of research-into-policy activity

The organisations are discussed below in relation to their aspirations and broad statements regarding research-into-policy, principles/approaches used and examples of these activities. Where there is evidence of knowledge co-production, this is noted.

Commonwealth Scientific and Industrial Research Organisation

Under the *Science and Industry Research Act 1949*, the CSIRO is 'to carry out scientific research … furthering the interests of the Australian community [and] contributing to the achievement of Australian national objectives [and to] encourage or facilitate the application or utilization of the results of such research'. Research-into-policy is embedded in these functions.

In more recent years, the activities of CSIRO have included engagement and co-production of knowledge; for example, in the Science into Society research group 'connecting stakeholders with the knowledge emerging from the latest scientific research'.[5] This group carries out applied social research and adopts a knowledge brokerage approach stemming from initial work on improving technology transfer for carbon dioxide capture and storage technology.

Knowledge transfer and research uptake at CSIRO occurs through ongoing discussions between stakeholders and in tailoring projects to maximise uptake by identifying:

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[5] www.csiro.au/Organisation-Structure/Divisions/Earth-Science--Resource-Engineering/Science-into-Society.aspx

- the potential impact of a project output
- whether an output will meet the needs of the end-user
- how end-users can best access or engage with the output
- ways to ensure that the output has continued use and is flexible for improvement
- whether an output integrates with public values and enhances public knowledge.

There is limited detail about whether these activities are applied consistently across Science into Society projects, how they have been evaluated and the outcomes of evaluation in order to identify transferable strategies for research-into-policy. Assessing research-into-policy is challenging for the reasons outlined in the literature review; that is, apart from direct impact, research may also have indirect influences on knowledge, understanding and attitudes around a given topic.

The CSIRO Land and Water Research Division 'conducts research to understand natural and engineered land and water systems and to predict how they respond to change'; the research 'is being used by Australian governments and major industries to underpin future policies and programs on land and water resources'.[6]

The Victorian Volcanic Plains Scoping Study (Dahlhaus et al 2003) is an example of CSIRO Land and Water research-into-policy. The project was an 'integrated, large-scale collaborative research, investigation and communication program to better target National Action Plan for Salinity and Water Quality funding and to attract co-investment of research'. This scoping study produced a framework to guide investment and implementation, with the caveat that to be effectual, it needed to:[7]
- have joint ownership; i.e. by Catchment Management Authorities, Landcare, Victorian Government etc
- encourage and support research collaboration; i.e. between CSIRO researchers and students, Victorian Government departments, universities, Cooperative Research Centres, etc
- have a reference committee to review projects and facilitate a communication plan
- be a platform for research to be attractive for co-investment by other 'production-oriented research providers'' (e.g. Bureau of Rural Sciences, Grains Research and Development Corporation).

Grattan Institute
The Grattan Institute, an independent think tank, contributes to public policy by '[fostering] informed public debate on the key issues for Australia, through both private forums and public events, engaging key decision makers and the broader community'.[8] There is an emphasis on expertise in the lists of people involved in their research programs, their governance structures (overseeing their research programs) and their affiliates (i.e. funders).

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[6] www.csiro.au/Organisation-Structure/Divisions/Land-and-Water/Land-and-Water-Overview.aspx
[7] Note: The establishment of the Victorian Volcanic Plains Conservation Management Network may be one outcome of this project: www.vvpcmn.org
[8] grattan.edu.au

Research-into-policy activities consist of reports, news and opinion pieces, podcasts, videocasts and media, email bulletins, as well as events (e.g. the following is from the Grattan Institute brochure to attract funding):[9]

> Grattan regularly holds Chatham House Rule[10] events with policy makers, affiliate representatives and other stakeholders to discuss policy issues, often in the context of Grattan work in progress or after publication.
>
> Speakers at our well-attended public forums include Ministers, senior public servants and leading figures from the academic and private sectors. These are often accompanied by smaller events where affiliates can discuss issues directly with visiting speakers.

These Chatham House Rule events do perhaps achieve research-into-policy at the highest levels and may even involve co-production between Grattan Institute researchers and policy-makers and other stakeholders. However, due to the nature of these events, this is difficult to assess.

Institute for Social Science Research

The ISSR program at the University of Queensland, with Policy as a cross-cutting research cluster, aims 'to contribute directly or indirectly to understanding, informing and influencing policy…[with research]… applied and problem-oriented and aimed at evaluating the effectiveness, affordability and viability of policies'. Within the Policy cluster is a research project 'Utilisation of Social Science Research', which aims to reconcile claims by academics that policy-makers ignore their research and claims by policy decision-makers that academic research is largely irrelevant to their needs, by asking.

- In what ways is social science research currently used within policy contexts?
- What conditions and circumstances support and hinder the use of social science research?
- Are there models for enhancing the policy-relevance and utilisation of social research knowledge?

A key part of the project is collaboration and partnership building with state and national governments, all of whom are represented on the project reference group. Presentations to government departments about the project and (presumably) about the partners' contribution/participation aim to keep policy-makers informed and serve as a forum to discuss policy implications. For example, project leader Brian Head posits three types of knowledge and evidence affecting policy, including political judgement, professional practices and research (Head 2008). His presentation to the Victorian Government Department of Human Services in March 2013 was careful to explain the benefits of evidence-based policy and the challenges to facing its development.[11]

Some research-into-policy activities that are less about engagement are indicated by the project methodology, such as potential knowledge transfer during surveys of policy-makers and researchers and follow-up in-depth interviews. The outcomes of the project are about revising strategies for developing policy-relevant research and a stated objective is that the project will lead to

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[9] grattan.edu.au/static/files/assets/5b60680a/Grattan_Brochure_Email.pdf

[10] A convention under which information disclosed at a meeting can be used but neither the speaker nor the meeting may be identified.

[11] www.issr.uq.edu.au/filething/get/15904/Vic%20PRG%20meeting_01.03.13_final_0.pdf

'recommendations on how academics and policymakers can *jointly* design and utilise research outputs' (emphasis added).[12]

Research forums and partnerships are also important aspects of the project, so, although there is little overt evidence of co-production it is taking place, it is hoped that the conclusions of this project are useful and transferable across research institutions (and not only social scientific research), policy institutions and the research–policy environment.

National Climate Change Adaptation Research Facility

From its establishment, NCCARF was to coordinate researchers '… to generate and communicate the knowledge decision-makers need for successful adaptation to climate change'. Thus the organisation engages in research-into-policy activities itself and supports funded research projects to do so. A glance through the research project final reports on the NCCARF website identifies useful information for the present project to understand the contributions of NCCARF project activities around research-into-policy.

In general, there have been various overlapping activities in research projects to promote collaboration, co-production and research-into-policy (see, for example, Meyer et al 2013, Verdon-Kidd et al. 2013), including:

- face-to-face meetings, workshops, focus groups
- involvement of a range of multidisciplinary stakeholders (academic, government, industry, community sector etc.) in project teams and input from end-users throughout the life of a project
- promotion and support of communities of practice
- dissemination via publishing documents, making them available on websites etc.
- tailored research products accessible for policymakers, such as policy guidance briefs (the format of which was developed by practitioners and researchers)
- guidelines to help practitioners use research outputs
- evaluation of project experiences.

NCCARF also has a dedicated research program 'Synthesis and Integrative Research', which 'draws together existing information relevant to key topics in climate change adaptation to address issues or research needs that have been identified by end users'. In addition, 'research efforts are shaped and supported by substantial involvement of end users throughout the project life cycle, from inception to information dissemination'.[13]

It is clear that NCCARF and its funded research projects have sought to use a wide range of strategies, including co-production, to improve research-into-policy. Unfortunately, there is little publically available evaluative data to review the effectiveness of these activities, but the current project seeks to engage with NCCARF to clarify these issues. As of November 2013:

> The Facility is currently continuing communication, coordination and capacity building activities on a reduced scale, supported by funds from its partners.

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[12] www.issr.uq.edu.au/content/utilisation-of-social-science-research
[13] www.nccarf.edu.au/research/s-and-i

Ouranos

The Canadian Consortium on Regional Climatology and Adaptation to Climate Change (Ouranos) is an example of a research-into-policy network of researchers, policy makers and end users. Its goal is to provide a network capable of delivering climate science according to the needs of a broad range of sectors for adapting to climate change. Thus, Ouranos projects focus on multidisciplinary teams collaborating to develop useful research outputs, which can be used by the government, private and community sectors.

Research projects supported by Ouranos use a range of methods for research-into-policy activities, which involve varying levels of collaboration, including workshops, face-to-face interaction, multidisciplinary project teams that include academics and government officials, multi-sectoral project funding and interactions with end-users. For example, one of the three main activities of the 'Climate Scenarios and Services Group' is to collaborate with end users:[14]

> ... to define key parameters such as the most appropriate indices and variables, number of climate simulations, and types of statistical analysis to select … to be sure that the limits and reliability of the results of scenarios are clearly identified. This requires a solid knowledge of climate modeling science and applied climatology as well as the ability to effectively communicate with users and understand their needs. The dialogue is maintained throughout the duration of a project and includes consulting, writing and reviewing reports, scientific papers, communications and discussions.

Their 'Collaborative decision making and risk management in the context of climate change adaptation' project[15] involved workshops and surveys of stakeholders, so that all participants could understand the different priorities and perceptions of the resource, services, and environment and heritage sectors.

As with other research institutions and boundary organisations listed in Table 2, Ouranos does not provide many details of the engagement end of research-into-policy activities. Different stakeholders may have consultative roles, but it is difficult to tell whether they would be embedded in the projects themselves.

An analysis of Ouranos knowledge transfer activities (e.g. brainstorming sessions, surveys, forums and symposiums) showed that Ouranos has worked as a boundary organisation by enabling links between researchers and decision makers and by managing diverse information in a multi-stakeholder environment (Vescovi et al. 2009):

> By enabling direct links among climate scientist and experts developing [vulnerability, impact and adaptation] activities, Ouranos provides/creates opportunities for innovative dialogue and facilitates knowledge transfer.

Overseas Development Institute

The organisation that is furthest towards the engagement end of the research-into-policy spectrum in Table 2 is ODI, which has a research program *on policy* (reflective and academic in style) and *for policy* (policy evaluation) according to an assessment by Stone (2009). Through systematic programs,

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[14] www.ouranos.ca/en/scientific-program/climate-sciences/climate-scenarios/
[15] www.ouranos.ca/media/publication/220_FicheChiasson2013WebEn.pdf

ODI 'engages with policy processes and disseminates … results … to the right audiences … by stimulating demand, improving evidence and building coalitions for change'.[16] ODI's original programs put the onus of research-into-policy on the researchers and other producers of evidence; for example, what researchers need to know, what they need to do and how to do it, as per the RAPID program (Mendizibal et al. 2011).

The Research and Policy in Development (RAPID) program is ODI's flagship methodology to influence policy and practice, and also to build capacity in other organisations (i.e. researchers, think tanks, civil society organisations and donors) to do the same. RAPID has a 'transdisciplinary focus on the relationship between research, policy and practice' and is more recently working on both the demand and supply side of the research–policy interface;[17] this newer work flows from extensive evaluation since it began in the early 90s.

RAPID works to influence policy by focusing on (Mendizabal 2011):

- tailoring research for the end user (e.g. political context, institutional limits and pressures)
- providing research that is credible, with practical solutions to policy needs packaged in an attractive format
- building robust networks between researchers and policymakers to build trust and communicate often; researchers and policymakers develop long-term relationships with face-to-face meetings and communication.

Research-into-policy actions and outputs for capacity development include: research and systematic learning; toolkits, how-to guides and manuals; dissemination; workshops; advice and mentoring; and communities of practice and networking.

The RAPID Outcome Mapping Approach (ROMA) component of RAPID was developed as an iterative process for organisations and practitioners to help maximise the impact of their research on policy (Michel et al 2013) because other models for promoting the uptake of research by policy-makers were deemed inadequate and approaches needed to:

- go beyond economic data to combine multiple narratives with qualitative and quantitative indicators
- take into account that there is no standard view of an issue and varying levels of uncertainty exist
- attempt to assess the benefits of research that closes the gap between science and society.

Stone's (2009) analysis of ODI came to the conclusion that ODI, in addition to influencing immediate political agendas on development, has 'organizational strategies of policy entrepreneurship that extend to longer term influence through creating human capital, building networks and engaging policy communities'. Importantly, Stone suggests that ODI:

> …forges relationships in its policy communities *to generate demand*. Through its networks, its meetings and workshops, the blogs, the publications as well as the more informal behind-the-scenes engagements with officials, personal networks, currying of favour at conferences, the

[16] www.odi.org.uk/about/strategic-priorities
[17] www.odi.org.uk/programmes/rapid

career movements of staff and the invitations to participate in semi-official discussion (emphasis added).

Managing the environmental science–policy nexus in government: perspectives from public servants in Canada and Australia

Although VCCCAR is not included in Table 2, as the aim of this desktop survey of research-into-policy in practice is to collect information on other organisations, it is worth mentioning an exploratory study by Hickey at al. (2013) into the perspectives, experiences and understandings of senior bureaucrats from provincial/state and federal government agencies dealing with environmental issues across Canada and Australia. The study includes input from the VCCCAR Director, Rod Keenan.

The study used focus groups to enable senior government policy and science managers to reflect on their experiences with environmental science and policy in government. The results suggested that

> … appropriately developing, managing and fostering the various forms of social capital that run across government may be central to the success of efforts to enhance the effectiveness of the science–policy nexus for decision-making. More specifically, increasing the levels of trust between policy-makers and scientists within government could be an important strategy in building social networks, increasing communication, integrating knowledge and improving collaboration on environmental issues.

Whether the outcomes of this study and the learning-by-participating that was achieved by the reflections leads to concrete research-into-policy action remains to be seen. However, it appears that here is some appetite for this in senior policy-making circles.

Examining and improving co-production of knowledge between research and policy — summary of emerging themes

As part of the initial stages of this project, a workshop was held on 15 August 2013 with a range of researchers and policy stakeholders taking part. The aims of the workshop were to identify effective knowledge co-production in policy development, analyse the successes and failures of different methods, and encourage participatory engagement between researchers, VCCCAR and policy representatives. This section of the review will be presented in report format, with a discussion at the end on how the emerging themes from our primary data collection reflect the themes that have emerged from both the literature and the practice reviews that we have carried out.

Workshop report

Present: Liam Smith (Monash), Judith Mair (Monash), Eve Merton (La Trobe), John Houlihan and Jordan Gregory (DEPI), Thomas Mitchell (DoH), Holly Foster (Office of the Fire Commissioner), Peter Durkin (DTPLI), Rod Keenan (VCCCAR)

Agenda

- Introductions
- Break out pairs with a focus on co-production in general, experiences, successes and failures
- Rod Keenan on specific VCCCAR project outcomes
- Break out pairs with a focus on VCCCAR projects
- Theme building
- Res-Pol Project presentation / questions
- Participation group

Introduction

The themes that emerged from discussions held at the workshop will be discussed under four main headings, as shown in Table 3. The key themes that emerged from the workshop are also identified below.

Table 3 Four main themes and subthemes of the workshop

Co-production generally — what is needed?	The authorising environment People The brief Dissemination
Co-production generally — what are the generic challenges?	Structural issues Difficulties achieving mutual understanding Dissemination issues
VCCCAR projects — reflections on projects that have shown successful components of co-production	Engagement Meeting objectives Dissemination
VCCCAR projects — reflections on projects where co-production has not been tried, or been limiting	Structural issues The brief People Perceptions Results/outcomes Governance

The workshop facilitated group discussion on the main themes that participants felt were important in successful co-production. These are included in *italics* in the headings below.

1. Co-production generally — what is needed?

The authorising environment *(flexibility; integration; leadership; a receptive policy environment; co-location; willingness to accept the transaction costs)*

- Good/appropriate governance structures in place

- Engagement from those in positions of responsibility/ key decision-makers

- Receptive environment that is open to a range of disciplines/perspectives, and willing to use new knowledge and information for policy development

- Buy-in for longer periods of time, and be adequately resourced (this may mean supporting fewer projects, but with more resources).

- Ownership of the project by key stakeholders

People *(interaction; trust; respect; shared language; shared acknowledgement; mutual understanding of needs and constraints)*

- Involvement from the right people, at various levels of seniority (both in government and in the partners/stakeholders)

- The right personality/approach/ attitude from the researcher/ policy officer

- People who 'get it' in relation to co-production and research into policy, and understand that there are different needs (for example, academics need publications, while governments need useful and tailored content)

- Researchers/ policy officers with broad perspectives and experience

- Relationships that are built on trust and commitment (note that this is usually the result of long term collaboration and relationship building). This requires face to face interaction.

The brief *(clear expectations of all stakeholders; clear rules of engagement; different roles that need to be played)*

- A good brief should have clear, specific research questions, and objectives that will allow a clear line of sight into policy and should include the required/suggested dissemination methods

- Starting with a discussion paper and then generating the full brief by round table discussion has been shown to be an effective approach

- Needs to be focused locally/ have local application, by translating global issues into the local context

- Framed according to a targeted need.

Dissemination *(providing a budget for this; understanding of the transaction costs of this)*

- The researchers/ policy makers should provide a variety of pathways for end-users to benefit from the research

- Dissemination should be built into a project from the start, and should be budgeted for (funders need to accept this need)

- Should involve a collaborative effort to create the final report

- Should involve peer review within research and policy sectors

- Should be targeted for different audiences and be 'fit for purpose'/ need.

- Acceptance that some Government-solicited research can remain as Government property and therefore shouldn't be disseminated by the researchers

2.   Co-production generally — what are the generic challenges?

Structural issues

- Transaction costs of project involvement and dissemination of outputs

- Opportunity costs of co-production

- Academic management structures that don't adequately value or reward co-production or dissemination activities

- Milestones built into projects at the beginning can work against any changes to the project suggested by co-production

- Underlying assumption that the policy environment will be receptive to research generally or a specific research output

- Time poor policy personnel with competing business priorities

Difficulties achieving mutual understanding

- "Burning bridges" can happen – particularly on the promise of collaboration that doesn't happen

- Attitude change and expectation management may be needed on both sides

- The "crusading" mentality by some academics (where researchers approach a project with a strong advocacy view) can work against co-production

- Perceived or real censorship of findings by government departments can mean that academics can't publish results (although this may not be an issue in all cases)

- Lack of trust regarding the underlying assumptions or statistical data that a research project is based on

- Lack of understanding of the value of co-production

- Lack of understanding of the policy or political environment.

Dissemination issues

- The creation of an end-product that is disconnected from the end users

- Lack of awareness by researchers of the broader application of their findings, beyond the immediate topic area of the project

- Lack of awareness/willingness from researchers to continue working on a project once the final report has been submitted

- Lack of translation of findings into policy or practice or lack of specific recommendations for specific projects/policies related to the research topic that are practical and implementable

- Lack of awareness of the potential avenues for dissemination, and their relative merit.

3.   VCCCAR Projects — reflections on projects that have shown successful components of co-production

Engagement

- Consistent and constant high level stakeholder engagement

- Regional stakeholder engagement and inclusion of a broad range of relevant stakeholders
- Clear ownership of a project by relevant departments

Meeting objectives

- Carrying out research for a range of stakeholders while maintaining integrity of independent research
- Timely and on-budget completions

Dissemination

- Correctly framing outputs for a range of stakeholders
- Demonstrated political awareness
- Regional dispersal of findings

4. VCCCAR Projects — reflections on projects where co-production has not been tried, or has been less successful

Structural issues

- Government and policy uncertainty
- Lack of bi-partisan support for climate change adaptation, or changing priorities within departments based on changes of ministers
- Few researchers embedded in government departments leading to a de-prioritisation of research activities
- Finding a final home/ champion for a project where multiple departments have been involved
- Physical and transaction costs of involvement and dissemination

The brief

- Some projects appeared unclear / directionless
- Lack of opportunity for stakeholders to be involved in dialogue around designing research briefs

People

- Personality-based selection of project areas "the powers in the room"
- A lack of critical reflection of VCCCAR and the projects it has funded
- Staff turnover meaning changes in management attitudes towards a project, or changes in personnel responsible for co-production on projects, or lack of available personnel to attend project meetings
- Researchers who may use the project to explore other agendas.

Perceptions

- There may be duplication of work between VCCCAR and other bodies/research organisations, (although checks and balances occur with VCCCAR Board and ARCIP to minimise this occurrence)

- Relationship between VCCCAR and NCCARF – is there an unequal partnership, with one viewed as having more credibility?

Results/outcomes

- Difficult to prove that research has made a difference – evaluation should be part of the project set up
- Research is not seen to be increasing the knowledge or capacity of stakeholders

Governance /Adaptation Research Centre Investment Panel (ARCIP)

- Government representation started with members at Director level but this has changed and now, although most members are strongly focused on policy, they may not be key decision makers for their organisation.
- Members may not always been in a position (or have the expertise or background) to make judgements on the suitability or otherwise of research project applications. Note that this is not specific to VCCCAR projects, but may apply equally to projects in other departments or agencies.

Next steps

- Development of Co-production Project Participation Group (with additional participants from other agencies)
- Identification and characterisation of effective knowledge co-production in the literature and through consultation with NCCARF, CSIRO and other agencies e.g. Health, Fire Awareness/ Engagement
- Potential collocation of project members within relevant agencies during project development and implementation

Many of the themes that emerged from this workshop can be clearly linked with the major challenges of knowledge co-production and research-into-policy discussed in the literature and practice reviews. This is particularly clear in the area of relationships and communication between researchers and policy makers, and also in terms of managing expectations on both sides. Further, the comments made during our workshop about the structural issues of the policy environment, along with those highlighting the transaction and opportunity costs, also reflect similar comments made by various authors in the research-into-policy literature.

However, our workshop participants also emphasised the need for projects to be 'owned' by a particular department in government, during the project life, but also beyond, so that the results and project outputs have a permanent home and are available to policymakers in future. This issue has not appeared as a significant concern in the existing literature and therefore is an important contribution from our workshop.

Reflections on what has and has not been successful in previous VCCCAR workshops has also helped to contextualise specific challenges (including government and policy uncertainty a lack of bipartisan support for climate change adaptation) and some particular success factors (consistent and high level stakeholder support, and timely on budget completions).

Conclusion

There is a lot of rhetoric around research-into-policy, particularly as the evidence-based or evidence-informed policy movement has gained momentum over the last decade. However, although the organisations examined here may present examples of how research-into-policy can be achieved, the most likely to do so successfully is ODI because their reason for existing is to accomplish this in the overseas development context. Also, the organisation derives some of its funding through providing training and materials to individuals and organisations, and their good examples are also a marketing exercise. The Grattan Institute could be considered to be at the other end of the spectrum, although their exclusivity promotes the idea that large effects can happen at the highest levels.

In summary, our knowledge of how research-into-policy may be achieved theoretically appears to be relatively developed — projects and research outputs need to be salient to decision makers, credible (authoritative and trusted) and legitimate, taking into account the values, concerns and perspectives of various actors.

The challenges to achieving this are also clear — they involve organisational cultures; processes within organisations and institutions; communication skills of both researchers and policy makers; enabling good dissemination of knowledge; differing expectations between researchers and policy makers; and a lack of time and money with which to make the effort to cogenerate knowledge. We even have some solutions for many of these challenges, as discussed in the literature review — promoting stakeholder participation, tailoring institutional processes and structures, building knowledge transfer skills among both researchers and policy makers, allowing researchers and policy makers to collaborate from the outset of projects so that expectations are clear on both sides, and prioritising knowledge transfer even in the context of limited resources of time and money.

However, we have not as yet been able to demonstrate clearly how the theory translates into practice. Although we know of organisations that seem to do well in the research-into-policy sphere, and we know some of the methods that can be used for knowledge co-production and knowledge transfer, it has been difficult to find specific cases where the pathway from research project to policy change is clear. It is likely of course that policy-makers draw on many different sources of information when making policy decisions, and therefore it will always be difficult to attribute causality to any specific research project. Nonetheless, the aim of this project is to assess existing and recent projects with a view to examining that pathway from research to policy outcome.

We need to plan carefully, analyse the contexts and pursue many avenues simultaneously (Nutley et al (2007):

> Multifaceted interventions that combine several different mechanisms have been a mainstay of efforts to increase the use of research evidence … However, 'multifaceted' has too often equated with 'scattergun' … There is a need therefore for more carefully assembled packages, underpinned by a coherent view of the research use process and proposed mechanisms of change, designed in a way that is contingent on the types of evidence of predominant interest and the local contexts of use' (p. 226).

Although this review did not extend beyond the research-into-policy literature and practice, it is likely that there are substantial insights to be gained by referring to the literature from other

disciplines. As the current project progresses, the researchers will be examining a range of other sources of information and theory to help to understand and explain the best ways to achieve co-production, and as an extension, to facilitate improved research-into-policy outcomes.

It is likely that theories around behaviour change, personalities and attitudes, persuasion and communication will all be relevant to the project. For example, literature does suggest that team building can be improved by understanding the different personality types (e.g. using Myer-Briggs, or Costa and Macrae's Big Five personality types), or team player typing of the individual team members. Such theories may come from business literature, including marketing, management and organisational psychology, or may indeed be derived from other disciplines including communication and psychology.

In the next stages of the research–policy project, we will be interviewing policy-makers and researchers involved in VCCCAR projects and in other research-influencing organisations, and developing capacity-building interventions. Therefore this document will be a work in progress.

Definitions

Boundary organisation	Organisations that straddle the science–policy interface, facilitating knowledge transfer between science and policy.
Evidence-informed policy making	An approach to policy decisions that aims to ensure that decision making is well-informed by the best available research evidence. It is characterised by the systematic and transparent access to, and appraisal of, evidence as an input into the policy-making process.
Knowledge co-production (also knowledge co-production)	A collaborative approach to research and capacity building, where researchers and/or policy-makers and other stakeholders create knowledge together.
Knowledge transfer	The deliberate movement of knowledge to make it accessible for use in or between organisations; originally used in the narrower sense of research commercialisation
Research-into-policy	Any process or activity that leads to policy development that is 'evidence-informed'

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