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THE NEXUS

CONSIDERING A WHOLE OF RESOURCE APPROACH

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DIALOGUE & DESIGNS

Because we're all here...

In writing this paper, I wanted to take full advantage of a likeminded group of policy researchers being in the same space to focus our attention not only on a particular case but to tap our shared expertise and experience to ask:

How can we improve the ways that we research the nexus of water, energy and food to achieve:

- greater public ownership of the issue,
- enhanced policy impact and
- more optimal resource management?

In the interests of encouraging readership to spark conversation, I am presenting this paper in a different format than usual. To those colleagues glazing over at yet another word document, 'Hope you enjoy it'. To the traditionalists, 'I'm sorry'.

This paper is structured around two key elements that have historically defined the 'struggle to govern the commons': dialogue and designs. As Dietz and colleagues write:

"Promising strategies for addressing (wicked environmental) problems include dialogue among interested parties, officials, and scientists...and designs that facilitate experimentation, learning and change." [1]

A great deal of scholarly effort has been dedicated to the task of shaping dialogue with impacted communities. From Freeman's leading work to understand stakeholders [2], to the development of network analysis [3], environmental and social impact assessment (ESIA) processes, to government regulation for stakeholder engagement, myriad methods and tools are available. Yet we continue to struggle with how best to pursue dialogue in a way that is inclusive, representative and meaningful, and to link this to research.

At the same time that the methods of dialogue matter, researchers and policy makers also face increasingly complex resource interactions. In the case of underground water in Australia, for example, these interactions have come under scrutiny due to the relatively recent introduction of a coal seam gas (CSG) industry.

Key points for discussion

This paper presents work from the Melbourne School of Government and Melbourne Energy Institute[a] to apply transdisciplinary research co-design to complex resource policy decision-making. The paper offers an overview of:

*the roles of dialogue and design in addressing wicked environmental policy challenges

*an Australian case concerning sedimentary basin resource use

*key opportunities and challenges for research co-design.

For community members, resource interactions, policy decisions and related projects (e.g. mining, carbon capture and storage (CCS)) are felt as cumulative impacts [4]. Yet much regulation and most impact assessment addresses resource management in a siloed manner. This tension relates both to the ways in which resources policy is designed in Australia (and many other countries) and also to research approaches that pursue project-by-project investigations.

This paper also explores **designs**, especially related to research to inform policy. It appears that very limited attention has been paid to the ways in which research design influences both stakeholder engagement and trust in data. Yet design is critical to the dialogue that we have with communities facing cumulative resource-use impacts. More importantly, it affects ownership of the research process and trust in resulting evidence.

This consideration is particularly important during a period of declining trust in government and 'experts', including scientists and policy scholars. Geo-political situations in which political dialogue undermines climate science while backtracking on key policy commitments to protect the earth's resources further hinders the capacity of scholars and policy makers to deploy an evidence-base to support intergenerational sustainability. The Trump withdrawal from the Paris agreement is a standout example, but Australia has shown similar backsliding in the Government's recent response to the Chief Scientist's plan for energy security, denying the recommendation for a clean energy target.

"ONLY LIMITED ATTENTION HAS BEEN PAID TO THE WAYS IN WHICH **RESEARCH DESIGN** INFLUENCES STAKEHOLDER ENGAGEMENT. MORE IMPORTANTLY, IT AFFECTS **OWNERSHIP** OF THE RESEARCH PROCESS AND **TRUST** IN RESULTING EVIDENCE. "

THE DESIGN/OWNERSHIP/TRUST NEXUS

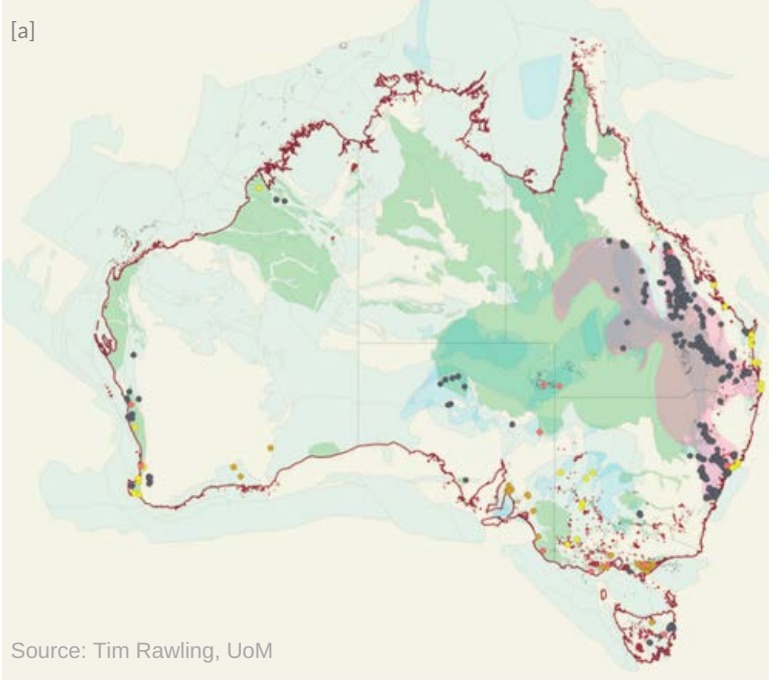
THE AUSTRALIAN CASE

Sedimentary basins provide 90% of Australia's primary energy and water for agriculture and rural populations [a]. But new technologies, including 'unconventional' gas extraction, like CSG, and CCS, are posing challenging questions for communities and policy makers about how Australia's sedimentary basin resources are understood, used and protected [b]. Information to support management and governance decisions is lacking and basin resources are governed by complex policy regimes that often fail to account for resource interactions [c]. Resource-use decisions are costly and afford few second chances. Estimates place groundwater losses from potential unconventional extraction at a **$6.8 billion GDP** decrease and $419 million in lost household use.

Community outrage further complicates the situation, as many Australians express deep concern over CSG extraction, especially the implications of hydraulic fracturing ('fracking') on precious underground water. Although numerous studies on fracking suggest that risks posed can be safely managed, general consensus, at least in the Australia, remains that the potential impacts of unlikely risks, especially to water supply, are unpalatable. A major 2014 study by the NSW Chief Scientist and Engineer's Office into the safety of CSG, for instance, was widely disputed by community groups for its statements about the safety of CSG practice and capacity to manage risk.

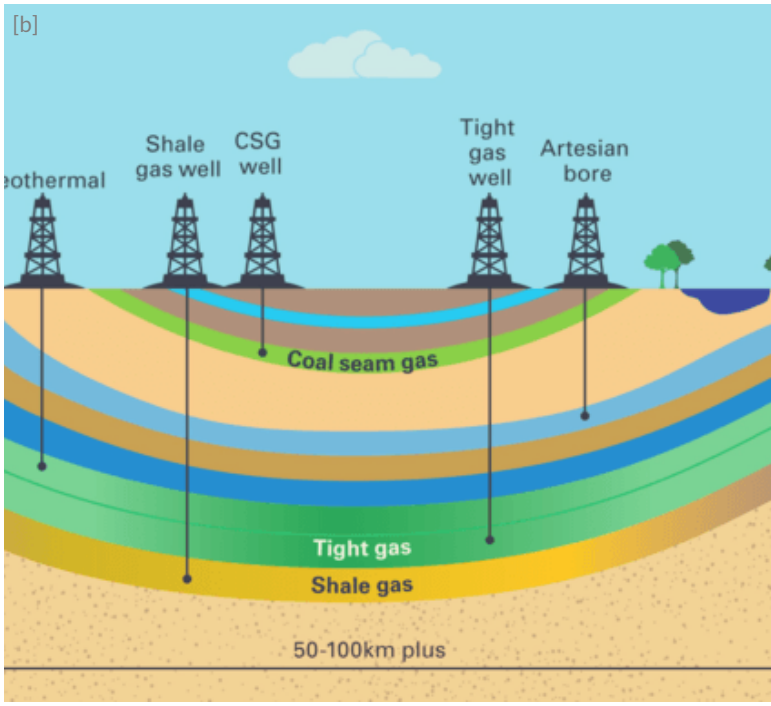
Backlash against scientific reports came within a highly politicised context in which CSG policy became a political football, with parties promising either to support economic growth through industry expansion or to ban the industry altogether. Such stances acknowledged substantial grassroots campaigns, including formation of the national protest group, Lock the Gate, with opposition activities resulting in project delays and industry withdrawal. In February 2016,

[a]

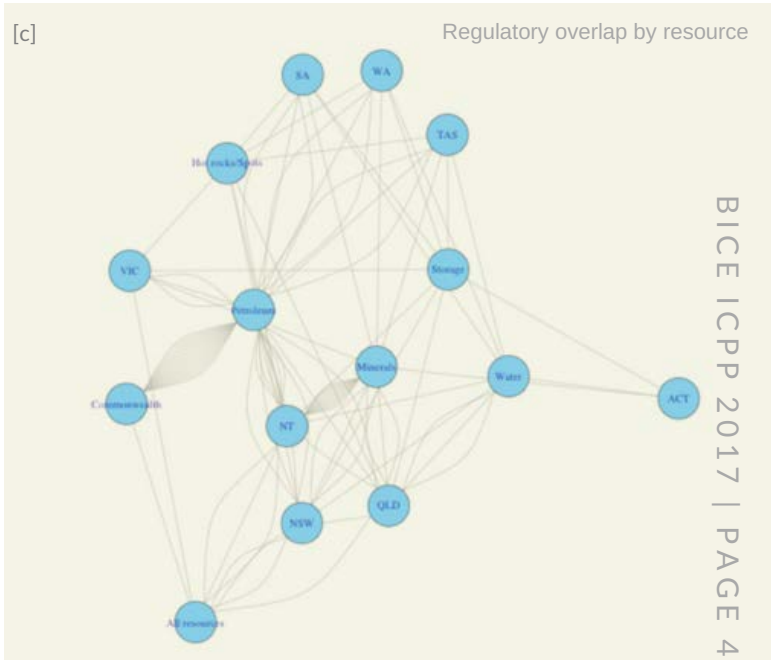


Source: Tim Rawling, UoM

[b]



[c]



Source: Sandiford & Hastings

POLICY & PROCESS

[The Australian case, continued...]
for example, one of Australia's largest energy companies, AGL, announced it was divesting from the CSG industry, altogether. Although offical statements attributed the divestment to financial shortfalls due to ailing commodity prices and longer-than-anticipated project lead times, current research is investigating the extent to which negative stakeholder pressure and loss of a 'social licence to operate' played a role [5].

Meanwhile certain states, such as Queensland, have developed their CSG industries apace, while states like Victoria (and previously, New South Wales) have instituted CSG moratoria until stronger evidence for the extractive technology's safety is presented.

The development of CSG is occurring at a time of growing public awareness about Australia's underground resources. The previous Chief Scientist declared ‘the sustainable use of sedimentary basins’ a National Strategic Research Priority and regulators, including the Auditor General's Office in Victoria, are beginning to explore how a shift to a 'whole-of-resource' perspective could better acknowledge and protect underground resources. This view moves away from regulation which has taken a traditional resource-by resource approach to one that views the basins, themselves, as the resource.

This shift in thinking is occurring at an important time, as the national mining boom ends, ‘unconventional’ energy sources to support economic competitiveness, growth and energy security are being pursued [6]. Many of these resources—including CSG— reside in sedimentary basins' underground ‘pore spaces’ also home to water, carbon storage and geothermal potential.

For Australia, growth of the CSG industry and emerging CCS technologies raise important questions for policy and process:

*To what extent does existing regulation meet contemporary understanding of and needs for sedimentary basins resource use?

*How can policy makers weigh up the competing needs and interests of disparate industries, with particular attention to the known and unknown resource-use trade-offs implicit in each choice?

*To what extent do social, political and actuarial concerns play into each decision and how can each of these factors be appropriately weighted to support optimal resource use?

In taking a whole-of-resource approach, sedimentary basin resources policy must weigh up the social, actuarial and political risks and licences inherent in decision-making for optimal resource use [7]. To support this, **a broader conceptualisation of the risk and licensing terrain is needed to fully apprehend the nature and dynamics of contemporary corporate-community-government decisions.** For instance, the corporations seeking to exploit basin resources need to operate 'beyond compliance', meeting the requirements of actuarial (regulated) licenses, stakeholder expectations (social license to operate) and government agendas (political license to operate).

The social, actuarial and political risks and licenses inherent in a whole-of-resource approach to sedimentary basins management help to reveal the dynamic and comprehensive range of stakeholders and issues facing complex resources [d]. When it comes to policy decisions about sedimentary basin resources, the various risks, opportunities and trade-offs presented by cumulative resource-use decisions illustrate the importance of an interdisciplinary approach to generating an evidence-base. Moreover, the trade-offs and tensions inherent in these considerations remind us of the importance of stakeholders and of maintaining a focus on the public interest.

KEY POINTS SO FAR

Dialogue

BUILDS TRUST

Literature, methods and tools are readily available to support inclusive, representative and meaningful dialogue. But how do we achieve this?

Design

CREATES OWNERSHIP

Inclusive research co-design identifies issues and priorities from stakeholders' perspectives and creates ownership of the process and trust in data.

Cumulative impacts

RESOURCES ARE INTERCONNECTED

A whole-of-resource approach (e.g. sedimentary basins vs water) is necessary for policy and practice that addresses resource interconnection.

SAP model

RISKS & LICENCES

Social, actuarial and political risks and licences reveal the complexity of whole-of-resource policy decision-making.

[d]

Social, actuarial and political risk and licensing model (SAP Model)
Source: [7].

CO-DESIGN

So, how can we, as policy scholars, improve the way that we research the nexus of water, energy and food to inform policy decisions that support optimal resource management and use?

One approach being trialled at the Melbourne School of Government (MSoG), with promising results, is an innovative process of research co-design. **Following about 18 months of studying research translation, knowledge mobilisation, research impact and engaged research, we developed an intensive research co-design program, MSoG Labs.**

MSoG Labs is dedicated to transdisciplinary research; research that:
*is externally demand-driven (e.g. by policy makers, industry or the public)
*brings together researchers and non-university stakeholders from diverse disciplines at the very earliest stages of research design, allowing them to work so closely together that they are *transforming* one-another's disciplines and perspectives.

The MSoG Labs model uses collaborative Group Model Building to establish the key policy, social and economic drivers influencing the issue in question. Participants learn the basics of systems thinking [8] and are taught simple ways to produce causal loop diagrams. Working together through this process over a period of days or weeks, participants identify key drivers and questions and generate a series of priority research aims.

Research co-design of this nature is particularly useful when we consider the nexus in question here. Given that cumulative resource-use policies and decision-making necessarily involve a range of stakeholders and interests--many of them competing--**traditional research approaches tend to result in situations that muddy the picture**. Here, each piece of research may present a separate rival for policy attention, rather than offering a synergistic knowledge base that can form a single compelling argument to inform policy decision-making.

Research co-design, using a MSoG Labs-style approach, conversely, helps to coalesce divergent research interests while generating more holistic research results. The process, however, is challenging. We have found that researchers who voluntarily involve themselves in transdisciplinary research are intrinsically motivated. Despite many universities espousing strong commitments to interdisciplinarity or research that engages beyond the university campus, few institutions formally recognise or reward their researchers for such activities. **Instead, praise and promotion remain focused on the traditional metrics of journal article publication and research grant funding. Such disconnection between contemporary research values and administrative practice and anachronistic performance measures inhibit the potential for policy science to achieve its potential impact.**

These concerns are particularly pertinent in areas like the water, energy and food nexus, as the very style of research co-design that could support a whole-of-resource approach to policy decision making is also one that requires researchers to be courageous and creative in the ways that they pursue their research.

COMMON SOLUTIONS

Finally, it is helpful and important to return to **dialogue**, as it plays a critical role in the style and success of research co-design advanced in this paper. While the research co-design approach outlined might suggest that participants enter the process with a blank slate, we have found that it helps to acknowledge and distil the likely assumptions being brought into the process.

For this reason and as a means of generating widespread engagement to address wicked environmental challenges, we have found it helpful to seed conversations through offering participants a research-based 'situation analysis'. This relatively brief (about 8-12 page) document summarises current research, policy and thinking on the issue in question and offers suggestions for research questions and priority research areas.

And this is where bravery really comes into the process. The coordinating researchers then gather their diverse and interdisciplinary participants together and ask them to unpick and unpack all those suggestions, those great ideas, that prior work. **By applying curious critique, steeped in their particular perspectives, participants work to break down and break through the assumptions that are likely creating barriers to policy advancement.**

For the water, energy, food nexus, new questions and considerations that have resulted from processes like this include:

*What are the attitudes about traditional, underground resources (i.e. fossil fuels) that sit behind individuals' adoption of renewable energy? And how do such attitudes spread within this particular cohort/community?

*What level of willingness is being shown towards prioritising the environment over other concerns?

*To what extent is public support for climate action related to the effectiveness of associated regulations?

*Where policies to address environmental concerns are implemented, what is the tipping point at which the public perceives policy 'saturation point' (i.e. they determine that further policies will have little/no impact)?

*If we presume that uptake of energy transitions follows a traditional innovation S-curve, then does the new amenity on offer have to be better than fossil fuel sources?

*Is there an identifiable point at which social movements or scientific evidence influence political promises?

These few examples demonstrate the breadth, depth and creativity of research inquiry that is possible when diverse perspectives work concertedly together. Even without a full briefing on the various environmental policy projects to which this method has been applied, the questions clearly show the influence and articulation of cooperative thinking, allowing the researchers, policy-makers and industry representatives involved to address the issues in a more holistic way.

If we are to find common solutions to cumulative resource impacts, we must also look to ourselves: to our research practices, our assumptions and our willingness to try (and sometimes to fail) in the adoption of new and different ways. **Policy science has historically pioneered engaged research and sought to achieve real-world impact. There is perhaps no more pressing or potentially impactful need for this today than in environmental and resources policy. The future is ours to inform.**

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FOR MORE INFO

SEDIMENTARY BASINS

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RESEARCH TRANSLATION

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RESEARCH CO-DESIGN

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