Ofwat consultation on driving transformational innovation in the sector

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Consultation response from the

Centre for Competition Policy

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Date: 20th September 2019

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This consultation response has been drafted by the named academic members of the Centre, who retain responsibility for its content.

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CCP response to Ofwat's emerging strategy: Driving transformational innovation in the sector

The authors welcome the opportunity to respond to this Ofwat consultation on collaborative innovation and the financial support targeted for it. We agree with Ofwat that a collaborative culture and financial ability are important factors driving innovation in the water sector. Collaborations between companies that are competitors are relatively rare in managing common-pool resources such as water. This response primarily offers learnings from a collaborative collective action among competing companies in Canada's oil sands in 2012 (with water as one of the environmental priority areas), to shed light on some organisational rules underpinning such relationship and collaboration. We do also reflect on the financial mechanisms that Ofwat suggest for driving innovation, as well as consider the role and importance of regulation.

1. Main barriers to innovation in the sector

A major difference between water and other utility sectors is that the appointed water companies in England and Wales are regional monopolies and household water consumers cannot change their water suppliers. As a result, the inherent incentive for companies to innovate and compete over customers is absent in the sector. This partly explains the high-risk aversion of water companies towards innovation, as noted by Ofwat. While investment increased after privatisation, there has been a reduction in centralised R&D spending.[1]

Innovation also requires a supportive culture among different parties in the sector. Plausibly, because they are regional monopolies, water companies may consider themselves as self-contained and thus do not explore the possibility of synergistic benefits that would provide value to water consumers beyond their own geographic areas. Moreover, the geographical distances between regional companies mean that where policies of good practice are achieved, this might be less visible to other companies. Without the right incentives or a clear mechanism or framework in place to share information effectively, this could be problematic.

Regulatory regimes further influence the degree of innovation. Ofwat uses comparative benchmarking to assess the performance of water companies. While this does not necessarily render collaborative innovation impossible, proper framework and incentive mechanisms need to be in place to ensure *collaborations with competitors* drive good outcomes for both innovation and competition. For example, we want to encourage companies that must deal with problems around water scarcity to collaborate in order to find better solutions to deal with leakage. However, given that Ofwat rank companies in terms of their water leakage efficiency (amongst other things), there needs to be an incentive framework in place that ensures companies are willing to share innovations that might help their competitors' improve their rank.

As the case study below suggests, the broader or more "global" an innovation, the more difficult it can be to get companies to agree to work collaboratively.

[1] Amodu T, Ennis S and Waddams Price C (2019), CCP response to National Infrastructure Commission: The future of regulation.

2. Collaborative innovation initiatives – learnings from a case study

Collaborations between companies that are competitors are relatively rare but have the potential to generate high syncretic rents. Bowen et al.[2] examine Canada's Oil Sands Innovation Alliance (COSIA) established in 2012 between twelve major competing companies in the Alberta oil sands. This research moved beyond studying "coordinated" actions (which commonly sees organisations agreeing on rules and acting to certify decisions independently) to "collaborative" actions where there is sharing of resources and technologies and is much more effective in managing common-pool resources.

The proposal to stimulate innovation proposed by Ofwat in this consultation (i.e. innovation competition and end-of-period innovation roll-out reward), differs from COSIA which was a collective action to share intellectual property and collaborate on developing new technology to improve the industry's environmental performance, such as priorities on tailings, water and greenhouse gases. Nevertheless, we consider the learnings on the organising rules that were developed to manage the relationship and collaboration highly relevant for the proposed innovation initiatives by Ofwat.

Similar to Ofwat's proposal on setting up a single independent expert entity and a joint framework underpinning funding criteria and ways to share information among water companies, COSIA members developed a set of formal agreements. Specifically, they agreed to:

- Allow firms to choose the projects that they wish to contribute to (instead of each company undertaking projects independently or all companies participating in all projects), knowing that all project outcomes will be shared with all members;
- Ensuring that any technology shared within the initiative would not be applied elsewhere (e.g. other countries or regions[3]);
- Determining whether a particular project is within the scope of each issue concerned.

The set of organising rules used to govern shared activities were central to the outcomes of collaborations; they took considerable time to negotiate and evolved considerably over the course of negotiation. In particular, Bowen et al. (2018) found that the set of rules varied with the scale of the environmental issue concerned. Companies took a shorter period of time to negotiate and generate more innovation projects when the issue was relatively small-scale and of local relevance, whereas both negotiation and outcomes were less effective when the issue is large-scale and of global relevance. For example, regarding greenhouse gases, COSIA failed to make technology/intellectual property shareable beyond the project team, as companies did not wish to share technology that was central to their competitive advantage outside of the Alberto region.

To help visualise these learnings, we have included two tables at the end of this consultation taken from Bowen et. al's case paper. Table 1 shows how the organising rules within COSIA

[2] Bowen F, E. Bansal, P. and Slawinski, N. (2018) Scale matters: The scale of environmental issues in corporate collective actions*, Strategic Management Journal*, 39, 1411-1436.

[3] Oil companies compete in a market where there is a tradable, global price for the commodity; water is not traded.

were drawn up. Table 2 provides a summary of the three environmental priority areas, their issue scale, how organising rules were applied by COSIA and what outcomes resulted from the collaboration. Finally, Figure 1 shows the model of collaborative collective action for common pool resources.

Applying case study learnings to Ofwat's proposal

a) There may be lessons from the COSIA example in terms of how water companies go about developing the framework that underpins their innovations. The case study provides some understanding about why agreements were successfully formed, and why others (often much broader in scope) failed. Getting the framework right and allowing for different scales of size to emerge allowed companies to identify where they would be willing to collaborate most effectively, and share the lessons of innovations to all members.

b) Closest to the current Ofwat consultation, the issue on water pollution and freshwater usage faced by COSIA is categorised as "mid-scale". It took 12 months for companies to agree on the set of organising rules. The scoping rule was the main challenge in the negotiation because once in scope, the associated outcomes need to be shared with COSIA. In the end, the emphasis was placed on environmental rather than cost-reduction technologies, and technologies at the surface level (upgrading, water treatment and metering) were deemed in scope, whereas those at the subsurface level were not. However, the scope was considered broad enough to improve the issues concerned.

c) Approaches to sharing and disseminating information, including arrangements on intellectual property, can be a crucial pre-requisite for collaboration. When it came to COSIA, the framework allowed companies to opt-in to projects they wanted to rather than working independently. This incentivised those most motivated and in the best position to collaborate to do so. It also avoided forcing all companies to participate because they were aware that lessons would be shared with all members.

For instance, water companies that deal with specific issues in their region such as water scarcity will be motivated to look into solutions and technologies that deal with this problem, whereas those companies working in regions that do not have this issue would be less concerned. This might include regions that must deal with too much water as well as those that might have average rainfall but could still benefit from the lessons learned through an innovation project. The COSIA study showed that specific scale issues allowed for a much broader scope of learning because companies were not concerned. This could mean that companies that do not necessarily prioritise developing technology to deal with water scarcity but are still affected by it to some extent would be most likely to benefit from well-developed innovation.

3. Mechanisms for financial support

The approach of recovering the funding of £200m is similar to the approach that Ofwat uses to determine how much each company pays for its licence fee. Moreover, the roll-out reward seems to be consistent with Ofwat's outcomes-based regulatory regime operated since 2014.

It is worth noting that outcome-based rewards may lead companies to be risk-averse in the innovations that they undertake if what constitutes "successful" outcomes is too narrowly defined. Often innovative products can fail and there would need to be a framework in place that allows companies to take risks on innovations that may not work out but not penalised by a poorly designed outcome-based reward system.

On the other end of the scale, innovation need not be entirely new technology or approach; novel and effective combinations of existing measures for improvement are part of innovation, which might be associated with a relatively lower risk. Ofwat may need to make it clearer about what they mean by "transformational innovation", and ascertain what they will deem possible within the defined timeframe 2020-2025, especially on innovative products in the early stages of development. With this said, if the bar is set too low, one might wonder whether companies should have been dealing with particular issues as a matter of good practice, rather than tapping into the fund. Ofwat does address this when referring to the risks posed by companies using additional funding when projects should be incentivised under the current price review framework.

In terms of incentivising collaboration, one thing we might draw attention to is the idea of a conditional collective bonus, which has had some success in improving farmers' participation in an agricultural environment scheme (EAS)[4]. The "choice experiment" encouraged winegrowers in France to enrol their land into an environmental scheme. Normally, farmers are just paid on an individual basis to enrol their land into these measures, though uptake has been low especially where more environmental effort is needed. The collective bonus (an additional payment) works by making a conditional bonus dependent on the basis that a group of farmers in their area collectively enrol enough of their land into the scheme to trigger the bonus. The authors demonstrated the success of the collective bonus in increasing participation, bringing down the price per hectare of land enrolled and in overcoming the difficulties that farmers were often too reluctant to make a collective commitment that made them too dependent on others' decisions.

Ofwat may explore whether this type of incentivisation could help get companies to enrol into innovations that might normally be dismissed because of risk aversion. Rewarding companies for being collectively tackling environmental issues through innovation may help overcome the perception of free-riding by other companies. It would also provide some flexibility in how payments can be made to companies for their innovations.

4. The role of regulation

The approach set out by Ofwat of developing the framework underpinning innovation competition by getting water companies to jointly develop some of the framework's detail for review/approval by Ofwat seems sensible. As Bowen et al's case study of COASIA shows, however, getting companies to agree to frameworks for developing more ambitious innovations can be time-consuming and had a higher degree of failure.

[4] Kuhfuss L., Préget R., Thoyer S. & Hanley N. (2016) "Nudging farmers to enrol land into agri-environmental schemes: the role of a collective bonus" European Review of Agricultural Economics 43 (4), 609–636, https://doi.org/10.1093/erae/jbv031

More generally, we would agree that Ofwat should take appropriate strategic control or oversight over processes and decisions, especially when considering the barriers to innovation that has been set out earlier. Ofwat should consider the key role that regulation can play in any scheme, not least because inaction to deal with environmental strain will have severe knock-on effects. One study[5] has assessed a panel of OECD countries who have implemented a wide range of environmental policies that aim to improve environmental conditions. The paper demonstrates that with respect to environmental policy, higher levels of regulatory stringency (set by regulators in "high regulation" countries) actually benefitted the overall productivity of industries. Productive firms benefitted from a short-run increase in productivity growth, whereas least productive firms suffered: this suggests that industry overall benefitted from the exit of least productive firms in the market.

Reference List

Albrizio S., Kozluk T. & Zipperer V. (2017) "Environmental policies and productivity growth: Evidence across industries and firms" Journal of Environmental Economics and Management (81) pp. 209-226

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Kuhfuss L., Préget R., Thoyer S. & Hanley N. (2016) "Nudging farmers to enrol land into agri-environmental schemes: the role of a collective bonus" European Review of Agricultural Economics 43 (4), pp. 609–636

[5] Albrizio S., Kozluk T. & Zipperer V. (2017) "Environmental policies and productivity growth: Evidence across industries and firms" Journal of Environmental Economics and Management (81) pp. 209-226

Table 1. Organizing rules within COSIA

Rule	Description	Illustrative Quotations
Joint Industry Projects ("JIPs")	Allowed firms to choose on which sub-issues to work, and all COSIA members would benefit from outcomes	• *"JIPs, joint industry projects – we can have all seven companies… or you'll have a subset or you can have just one, an independent project. But the JIPs are the actual projects" (Tailings EPA member)* • *"Two or three or five of however many companies can form a joint industry project, which will have its own agreement, do that work together, co-fund it and then contribute the results of that work to the [EPA] as well" (Water EPA member)* • *"We hope that each JIP might have two or three or six companies involved… certainly not every one will have all twelve companies involved. And, you actually don't want that. You kind of prefer to keep the groups small, let them run with it. The other companies get to share the technology anyway if it's a winner. And, if it's not a winner, well, that's useful information too because it might be something that they… would have pursued if it hadn't been proven unsuccessful" (COSIA leadership team)* • *"Because of the mandatory requirement to share everything that's developed in the alliance, a company doesn't have to be part of every single JIP. In the past you had to be part of 10 JIPS in order to get the intellectual property and use it. Now you only have to be part of one. You can trust your alliance colleagues to go forward and lead and produce results in 9 other JIPs because you get results back. So it can decrease the amount of effort you have to give for the same amount of gain again by an order of magnitude." (COSIA leadership team)*
Field of use	Stipulated that any technology developed within COSIA was for use only in the Canadian oil sands	• *"The other thing we've done is we've taken pains to make sure that the sharing aspects of this technology is very tightly limited to what we call 'field of use'. So it has to be oil sands only in Canada. So, if a technology is developed inside of the EPA, everybody gets to share it; but, they only get to share it inside of Canada on oil sands" (COSIA leadership team)* • *"But at the end of the project you still get the intellectual property that resulted from the project but only to apply in the field of use. But if you're interested in it for global then you have to let the contamination aspect go and join." (Greenhouse Gases EPA member)* • "*And what we were saying is we can be your competitor… in Amman and Abu Dhabi but you're not going to be our competitor for water in the oil sands.*" *(Greenhouse Gases EPA member)*
Scoping	Each EPA decided which technologies would be considered out of scope – usually, cost-reduction technologies	• *"We're trying to figure out what do we want to collaborate on, you know, what's the extent of the scope and what are the contractual arrangements and commercial agreements that we have to sort of set up before we can start engaging" (Water EPA member)* • *"So some companies at the table wanted a very broad scope and other companies wanted a very narrow scope, and the process was put in place in December to breakdown or understand all the reasons… Was it contamination reasons, business opportunities reasons, competitive law reasons? And once we understood what the reasons were then we were able to build solutions to address those concerns and broaden the scope to a point where every company at the table was comfortable with it" (Greenhouse Gases EPA member)* • *"One aspect is the scope of what we're dealing with. It tries to take that spectrum of technologies that are not competitive but have environmental impact to ones that are highly competitive and don't have an environmental impact, and then there's everything in between… We had to draw a circle for companies to be able to be prepared to lend access to anything they're for in that scope." (COSIA leadership team)*

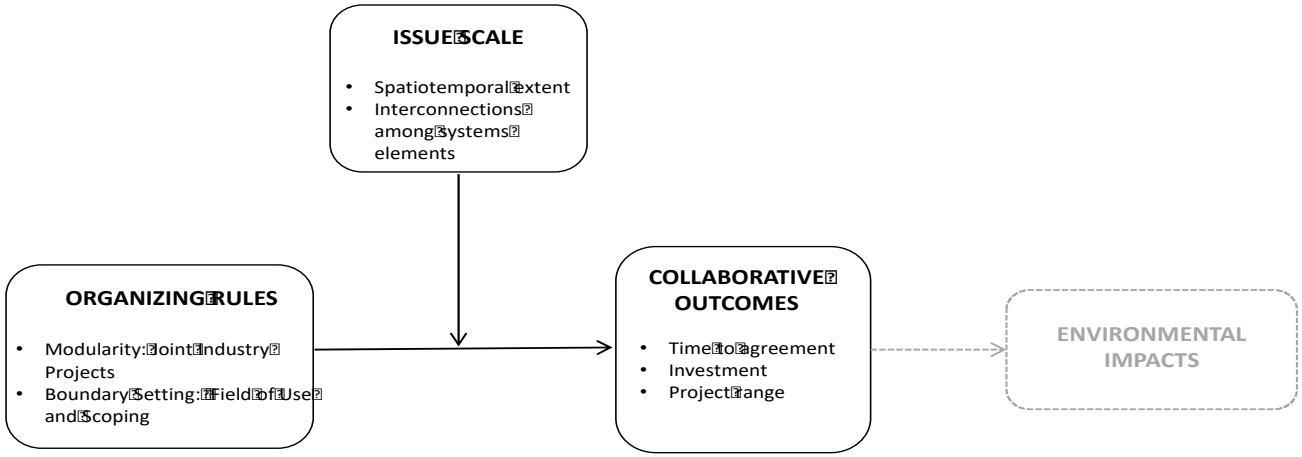
(*from Bowen, Bansal & Slawinski, 2018, p.1419*)

Table 2. Environmental issues, organizing rules and outcomes within each environmental priority area (EPA)

	Tailings EPA	Water EPA	Greenhouse Gases EPA
Issue scale			
Issue extent	**Local** Confined to oil sands production area	**Regional** Three river basins were affected: the Athabasca, Beaver and Peace River Basins	**Global** Greenhouse gas emissions from the oil sands affected the global carbon cycle
Interconnectedness	**Low** Environmental impacts discrete and relatively contained	**Medium** Water quality impacts biodiversity, habitat and wildlife across the watershed area	**High** Climate change also affects other global and long-term issues including ocean acidification, weather events, habitat changes, food security
Organizing rules as applied within each EPA			
Joint Industry Projects	**Widely shared** Companies joined the projects they wanted, and shared technology/IP among all EPA members	**Widely shared** Companies joined the projects they wanted, and shared technology/IP among all EPA members	**Not widely shared** Greenhouse Gases was the only EPA where only those companies that participated in a project benefitted from the technology/IP
Field of use	**No concerns with IP mobility** Limiting technologies to Canadian oil sands was not of concern, given that developed technologies could only be commercially applied to the Alberta oil sands	**Some concerns with IP mobility** Limiting technologies to Canadian oil sands presented some concerns, because techs could be applied in other jurisdictions. But it was possible to limit some types of technology development to the region	**Significant concerns with IP mobility** Limiting technologies to the Canadian oil sands presented significant concerns, because techs developed to reduce greenhouse gases could be transferred to, and create equivalent benefits in, other competitive arenas globally
Scoping	**Broad** Scope remained broad. All companies agreed to share IP on reclamation, even if it was potentially cost-reducing	**Somewhat broad** Scope of EPA was broad enough to include water at the surface level, even if it was considered cost-reducing. Subsurface water (incl. steam) was deemed out of scope	**Narrow** Scope of EPA became very narrow and limited to environmental technologies and excluding cost-reducing technologies to ensure all companies signed on
Outcomes			
Time to agreement	8 months (October 2012)	12 months (March 2013)	19 months (September 2013)
Investment			
Technologies shared*	117 technologies, $401m	171 technologies, $232m	124 technologies, $232m
Projects completed*	100 projects, $626m	26 projects, $12m	12 projects, $2m
Active projects*	42 projects, $75m	43 projects, $231m	26 projects, $15m
Project range	Addressed issue scale e.g. reclamation technologies	Addressed issue scale E.g. Regional Water Solutions	Did not address issue scale e.g. Carbon Capture and Storage

** by November 2014, approximately a year after the end of our formal data collection. Source: COSIA Performance Update*
(from Bowen, Bansal & Slawinski, 2018, p.1421)

Figure 1. A Model of Collaborative Collective Action for Common Pool Resources



(from Bowen, Bansal & Slawinski, 2018, p.1428)