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Submission to IPART

Prices for Sydney Water from 1 July 2020

21 October 2019

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Introduction

Thank you for the opportunity to make a submission. While this submission is critical of the proposal it is important to recognise that both Sydney Water and IPART have presented a great deal of information to support a public process of consultation. A perceived lack of transparency potentially reflects different paradigms rather than intention. The authors previously made a submission on the operating licence for Sydney Water Corporation. This current submission proposes that important and long held (COAG 2008) national urban planning principles require greater attention in the preparation and assessment of the price proposals by IPART.

1. Use pricing and markets, where efficient and feasible, to help achieve planned urban water supply/demand balance.

   Tariff structures for water supplies should be designed to signal the full value of finite water resources to end users to encourage efficient water use. The price charged for urban water services should be transparent and linked to the level of service provided. (Principle 7)

   Our research showing that the price of water services and sewerage services are indivisible and that the ratio of fixed and variable charges has implications for community equity and water efficiency are integral to an assessment of water charges but neither IPART nor the public have received the benefit of this type of analysis, insights or projected implications for future pricing. **Price determinations that do not consider the public benefit implications of the pricing structures are less than optimal.** Whilst a narrow construct of monopoly interest excludes many utility costs and public values as external, these assumed externalities do impact on the viability of water resources in the medium run. These impacts include undervaluation of utility operations and crowding out of other alternatives that are needed for provision of a scarce resource into the future. The existence of unmitigated externalities is an indicator of market failure.

This principle is also a consideration for the Economic Level of Water Conservation policy adopted by both Sydney Water and Hunter Water and approved by IPART. While a review of the policy has been called for by IPART, it is now overdue. Submissions were made to Sydney Water in 2017 and IPART in 2018 noting economic concerns about the failure to consider geographic costs of service delivery, the interpretation of marginal costs as a partial 'cost of water' and the negative implications this had for both efficient infrastructure expenditure and water security for Greater Sydney. IPART may need to consider if due process and the public interest was satisfied in approving the policy.

We recommend that IPART consider the medium run spatial costs of delivering water, sewage and stormwater services. Both the utility and whole of society perspectives will need to be considered. In addition, IPART should evaluate the abolishing all fixed tariffs and implementing a single variable tariff for a water and sewage service. This fully variable tariff should also be spatially variable using local government areas as the spatial boundaries for assessment. This initiative will provide incentives for institutional and consumer efficiency, and our research shows that this approach will improve efficiency and equity of outcomes.[1]

2. Urban water planning should be based on the best information available.

   Including scenario planning, incorporating uncertainty in supply and demand, as well as integrated with future economic development and land use planning to ensure full knowledge of the availability of water supplies and water savings opportunities. (Principle 2).

   A key issue for regulators is to overcome the asymmetry of information within markets dominated by monopoly or oligopoly arrangements. In this situation, the imbalance of information favours the monopoly perspective in negotiations with respect to determination of costs and subsequent regulatory decisions with respect to price.

   Asymmetry of information is another key indicator of market failure. In a regulatory environment, people and economic entities outside of the monopoly process can only respond to information provided by the monopoly and others inside of the industry.

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[1] Coombes P. J., Barry, M. E., Smit, M., Bottom up systems analysis of urban water resources and market mechanisms for pricing water and sewage services. Hydrology and Water Resources Symposium (HWRS 2018): Water and Communities, Engineers Australia, Melbourne, Australia, 2018

Given that IPART can only respond to submissions from interested parties, the scope and importance of these inputs is likely to be constrained by the offered information.

3. Stakeholders should be able to make an informed contribution to urban water planning.

   Including consideration of the appropriate supply/demand balance. Urban water planning should be based on a process that is transparent and inclusive. (Principle 3).

   The Sydney Water Corporation is required by its operating licence to operate as a successful business. The Sydney Water Corporation does not appear to be a government agency nor are its employees public servants. Expecting Sydney Water to develop policy to regulate itself in the public interest and for it to provide advice and strategy in the public interest seems to be a misunderstanding of the Sydney Water operating licence and the economic behaviour of monopolies. The authors' previous submission on the operating licence called for a clear **separation of powers** and we submit that the responsibility for strategy and planning is a government responsibility in the public interest and is inappropriate to be carried out by a corporate monopoly. This task should be passed onto the Department of Planning, Industry and Environment and all the information resources of Sydney Water be made available for planning purposes.

   The absence of informed, transparent and evidence based medium term planning by either Sydney Water or the Department of Planning, Industry and Environment does not support an informed review of the Sydney Water price proposals by IPART or an informed public consultation process and does not justify a five-year approval on Prices from 1 July 2020. Limiting discussions to five-year pricing reviews results in the exclusion of many medium run costs and public challenge to those assumptions from regulatory decisions. **We recommend that Sydney Water provide a fully costed medium run operating strategy that is subjected to public debate and input via a formal IPART process.**

   As discussed, Operating licence requires Sydney Water to be a successful business, they therefore have a commercial interest and are not a public agency and their staff are not public servants. They are obligated to operate in their own interests, not the public interest. In order to achieve medium and long term planning in the public interest Sydney Water has a clear and legitimate conflict of interest and this function should be carried out by government. Importantly, planning in the public interest would reduce infrastructure expenditure and promote more efficient and a wider range of water solutions and would save the NSW government and the NSW community considerable funds in the longer term.

   We submit that the problem of restricted access to data and data asymmetry for different contributions to water regulation and policy, and the community is substantial a market failure. We recommend a policy to share all information relating to water resources and make this information equally accessible to government, planning bodies, regulators and interested members of the public commenting on planning and pricing proposals. This should specifically include information related to spatial costs at the highest available resolution.

It is noteworthy that public data resources (such as rainfall, streamflow, dam levels, water demands and finances) have increasingly been withdrawn from public access due to classification as commercial in confidence. We now have situations were previously publicly available data is now reclassified as commercial in confidence. For example, the data held by the authors of this submission was sourced at times when the information was freely available but this information is not available in the current environment.

4. Manage water in the urban context on a whole of water cycle basis.

   Including stormwater management, wastewater treatment and re-use, groundwater management and the protection of public and waterway health. Such an approach should result in delivery of diverse water supplies which are fit-for purpose and optimise the use of water at different stages of the urban water cycle. (Principle 4).

   The water and wastewater servicing approach by government monopolies are currently evaluated from a monopoly perspective at a single spatial scale. This paradigm does not account for the spectrum of whole of society challenges, costs and opportunities that exhibit strong spatial variations. In combination with use of partial cost methods, this narrow perspective results in low pricing and benefit perspectives which crowd out opportunities which may be perceived to compete with the sale of monopoly services – such as water efficiency and other servicing opportunities.

5. Consider the full portfolio of water supply and demand options.

   Selection of options for the portfolio should be made through a robust and transparent comparison of all demand and supply options, examining the social, environment and economic costs and benefits and taking into account the specific water system characteristics. Options should include optimising the use of existing infrastructure through efficiency measures; residential, commercial and industrial demand management initiatives… and the development of additional centralised and/or decentralised water supply options. (Principle 5).

   Urban water management is a system and a reductionist approach of considering water, sewage, stormwater, recycled water, demand management and waterway quality as separate and largely unrelated subjects is difficult to justify in the light of currently recognised and awarded research. For example, Barry and Coombes (2018) find that the use of average demand inputs produces unreliable understanding of water security and utility operating conditions.[2]

The absence of consideration of alternative supply and demand options in the Sydney Water price proposal suggests that there are no other options and deprives both IPART and the public from an important opportunity to comment and provide direction to Sydney Water.

6. Develop and manage urban water supplies within sustainable limits.

Ensuring the ongoing protection of the environment and waterway health is an integral part of urban water planning. (Principle 6)

What are the implications of the Sydney Water price proposals for extraction and management of water resources and waterways, including the Shoalhaven waterways, Sydney rivers and Sydney Harbour? What standards are being applied and underly the price proposals?

We are mindful of research that demonstrates that the setting of boundary conditions and assumptions dominates that outputs of economic analysis of water resources (Coombes et al., 2016).[3] The provision of a single option for pricing review in environment where there is increasingly limited access to data to verify the assumptions does impact on the regulator's ability to act in the public interest. Moreover, the lack of separation of powers in the review process impacts heavily on this process. There is a need to also carefully consider the potential for pathway dependence in the review process for this pricing processes.

7. Context

Sydney Water Operating Licence Business requirements

IPART requirement for long term planning by Sydney Water by 1 November 2019

IPART requirement for a review of the Economic Level of Water Conservation by 30 September 2020

COAG 2008 National Urban Water Planning Principles (attached)

Bottom up systems analysis of market mechanisms for pricing water and sewage services, Coombes 2019

Infrastructure Australia Audit 2019 Commentary

[2] Barry M. E., and Coombes P. J., Planning resilient water resources and communities: the need for a bottom-up systems approach, Australasian Journal of Water Resources, 22(2), 113-136, 2018

[3] Coombes P.J., Smit M. and MacDonald G., Resolving boundary conditions in economic analysis of distributed solutions for water cycle management. Australian Journal of Water Resources, 20(1), 11-29, 2016

8. **Application of the urban water management principles to medium term planning for Greater Sydney and price determination considerations.**

The following applies the systems framework analysis recognised by Engineers Australia by the award of the GN Alexander medal for Hydrology and Water Resources, to the Greater Sydney region. The material is presented to contrast with the arguable lack of information used by Sydney Water in presenting price proposals, the lack of scenario planning, the lack of consideration of geographic factors in operational costs and savings, the lack of consideration of alternative demand and supply options and the lack of information in relation to the implications for public benefit from different price structures

Transfer distances, costs, tariffs and economics

Utility water supply throughout the Greater Sydney region is subject to long transfer distances. A focus on centralised supply and disposal solutions has defined the urban water sector as a transport industry that moves water and sewage across large distances.[4] This centralised paradigm has substantial impacts on resources (Clarke and Stevie, 1981)[5] and economic outcomes (Coase, 1947).[6] The utility water supply transfer distances from reservoirs to local government areas are shown in Figure 1 and the utility wastewater disposal transfer distances from local government areas to wastewater treatment plants are presented in Figure 2.

[4] Coombes P.J., and Barry M.E., (2014), A systems framework of big data driving policy making for Melbourne's water future, OzWater14, Australian Water Association, Brisbane.

[5] Clarke R.M., and Stevie R.G., (1981), A water supply cost model incorporating spatial variables, Land Economics, University of Wisconsin Press, 57(2), 18-32.

[6] Coase R.H., (1947), The economics of uniform pricing systems, Manchester School of Economics and Social Studies, 139-156.

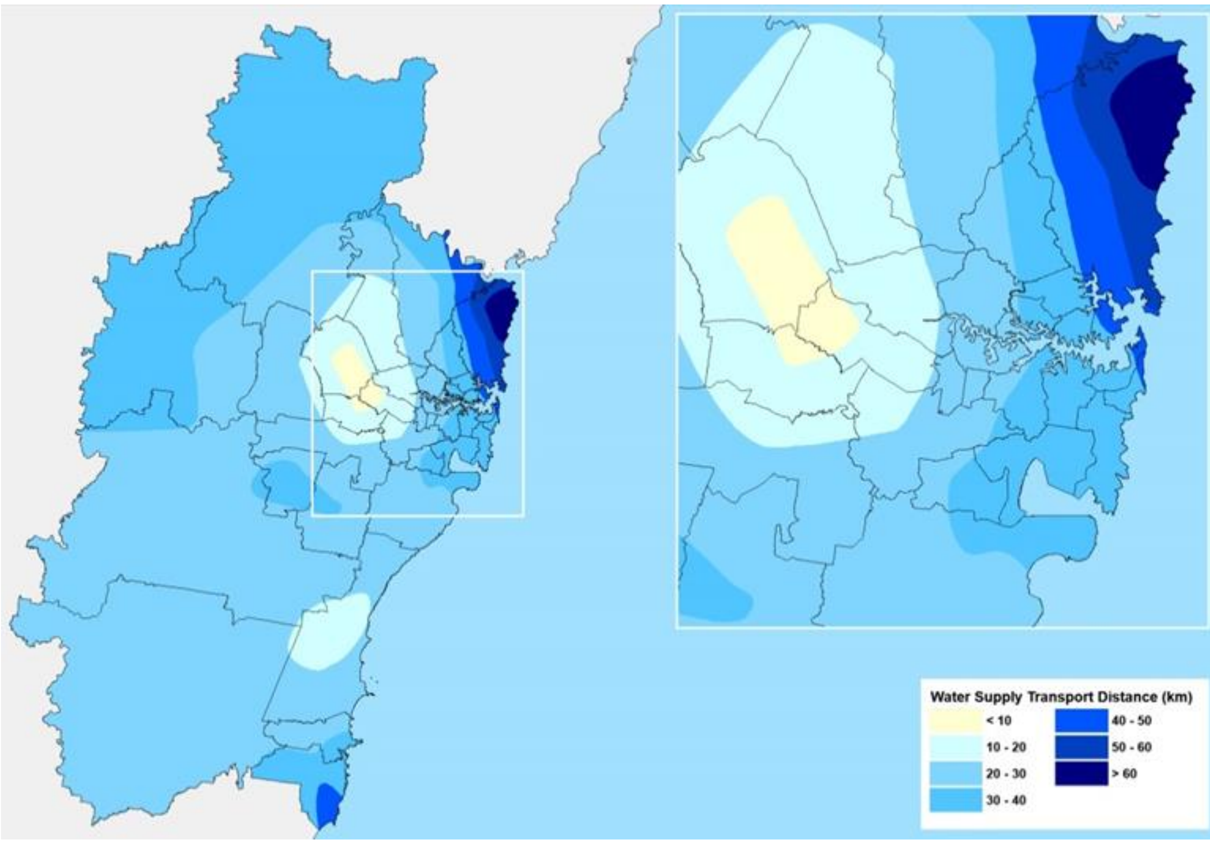

Figure 1: Utility water supply transfer distances across greater Sydney

Figure 1 reveals that utility water transfer distances range from less than 10 km to greater than 60 km across the region.

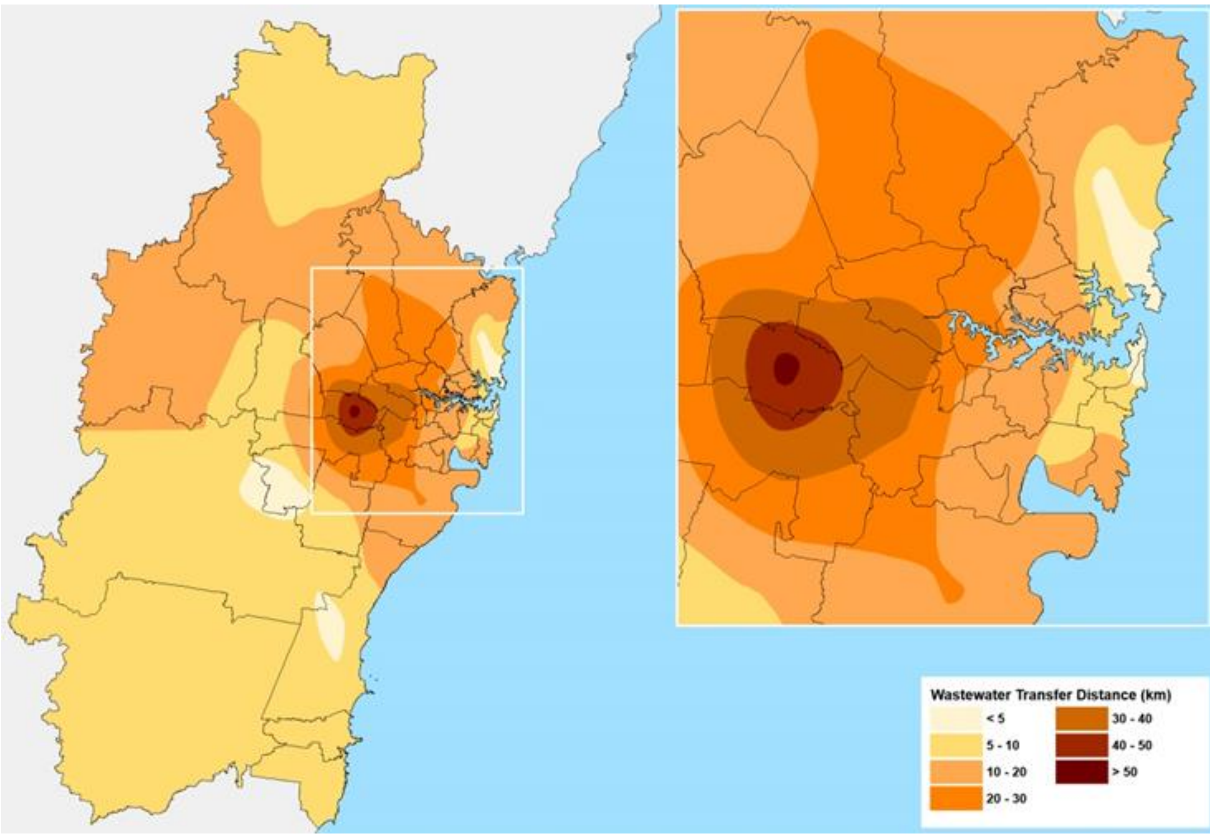

Figure 2: Utility wastewater disposal transfer distances across greater Sydney

Figure 2 shows that utility wastewater disposal distances range from less than 5 km to greater than 50 km across the region.

In order to inform our submission, we investigated four options for providing water, wastewater and stormwater services to Greater Sydney.

- BAU: Business as usual to 2050
- NoBasix: BASIX policy ends in 2010. Reduced uptake of water efficiency and rainwater harvesting
- NewBasix: BASIX upgraded to include enhance digital processes and stormwater targets with increased uptake of water efficiency, rainwater harvesting and green infrastructure
- BSX_price: No fixed tariffs for water and sewage services, and impervious area tariffs for stormwater services. Spatial demand and price elasticity derived from research and SWC data and studies. IPART revises spatial prices every year based on demands and costs.

The total capital and operational costs of providing water and sewage services throughout the Greater Sydney region are presented in Figure 3 for the period 2010 to 2050 for each option. Note that these costs are based on 2019 dollar values. These spatial costs of water and sewage services for the BAU option were derived for all costs in the planning horizon from 2010 to 2050 and are shown in Figure 4.

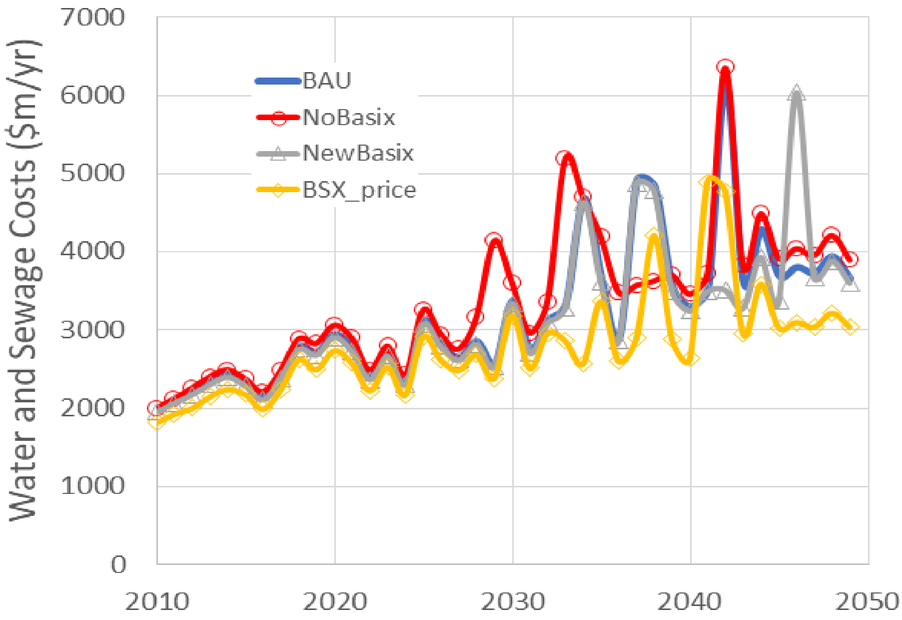

Figure 3: Total capital and operational costs (in 2019 dollar values) for Greater Sydney from each option from 2010 to 2050.

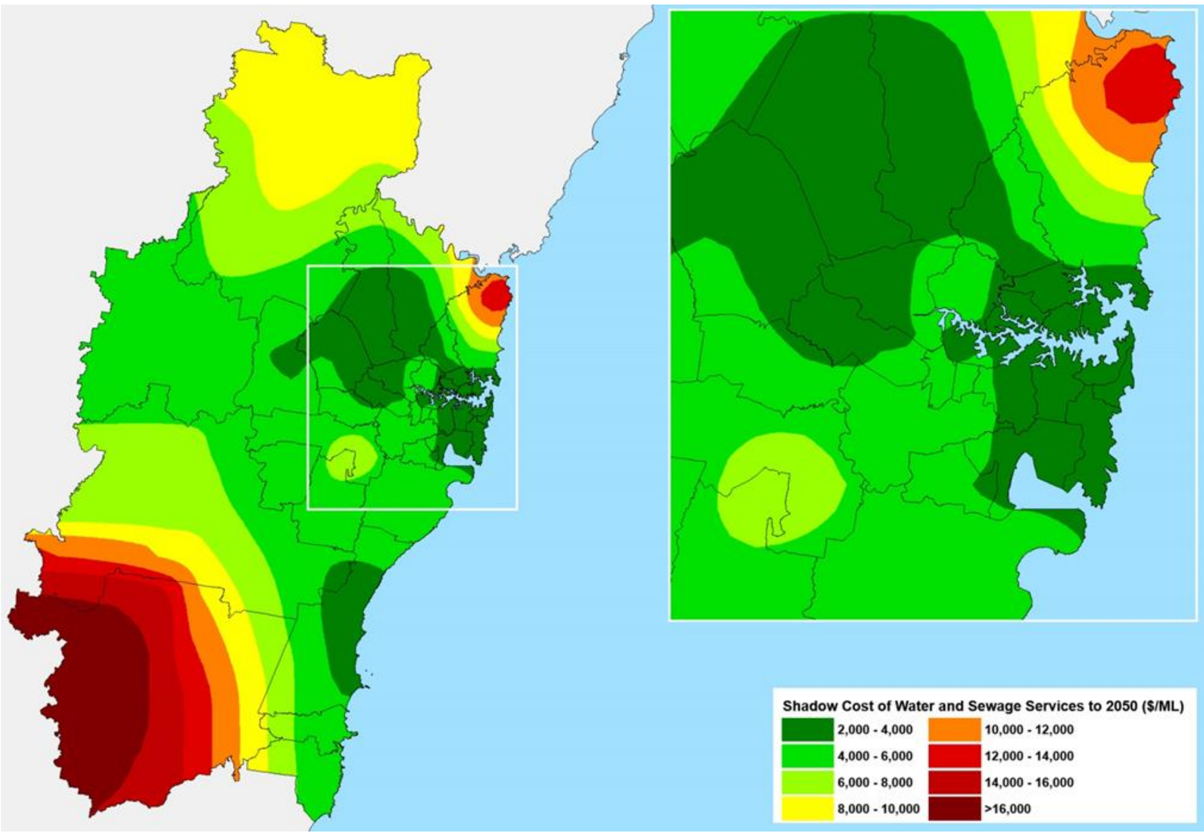

Figure 4: The spatial costs of utility water and sewage services to 2050 across greater Sydney for the BAU option

Figure 3 shows that the annual costs to provide water and sewage services in the BAU option increase by $1681 million (85%) to $3657 million/annum by 2050.

The NoBasix option is subject to increases in annual water and sewage costs by $1917 million (97%) to $3894 million/annum by 2050. A reduced uptake of water efficient appliances and rainwater harvesting results in higher annual costs of $236 million by 2050.

Annual costs to provide water and sewage services for the NewBasix option increased by $1627 million (82%) to $3603 million by 2050. Greater uptake of water efficient appliances and rainwater harvesting has lowered annual costs by $52 million in 2050.

The BSX_price option resulted in an increase in annual costs to provide water and sewage services of $1065 million (54%) to $3040 million in 2050. Increased uptake of rainwater harvesting and water efficient appliances, and changed water use behaviours decreased annual costs by $615 million in 2050.

Figure 4 reveals that the total spatial costs of water and sewage services ranged from $2/kL to greater than $16/kL. These values represent all operation, renewal, capital and water security costs divided by the cumulative water supply volumes for the period 2010 to 2050. Given that in the long run all costs are variable, these results represent the long run spatial marginal costs of water and sewage services for Greater Sydney and can be used to evaluate the economic viability of distributed solutions.[7]

These values can be considered to be shadow cost maps for evaluation of distributed strategies such as water efficient appliances, rainwater harvesting and alternative water sources. A majority of these spatial long run marginal costs are greater than the values of $1.28/kL in the short run and $2.08 in the long run proposed by Sydney Water Corporation for assessment of water conservation strategies.[8]

The revenue earned from consumers paying for utility water and sewage services for the Greater Sydney region is presented in Figure 5 for the period 2010 to 2050. This source for revenue for the BAU, NoBasix and NewBasix options includes fixed and variable tariffs for water and sewage services as levied by IPART (2016)[9] and reported in Sydney Water Annual reports (for example; SWC, 2010).[10]

The BSX_price option does not include fixed tariffs and utilises two full usage tariffs for water and sewage, and stormwater services. This option uses a full usage tariff for water and sewage services that is levied by the water utility for each local government area. The usage tariffs are revised annually by the regulator in response to spatial costs and demands. A single impervious area tariff is also levied by local government for stormwater services to properties in each local government area. This impervious area tariff will also be revised annually by the regulator for each local government area in response to costs and environmental impacts.

[7] Coombes P.J., Barry M.E., and Smit M., (2019), Revealing the spatial long run marginal costs of water and sewage services for Australian capital Cities, In review

[8] Sydney Water (2018), Water conservation report 2017-2018, Sydney Water

[9] IPART (2016), Review of prices for Sydney Water Corporation 1 July 2016 to 30 June 2020, Water Final Report, Independent Pricing and Regulatory Tribunal.

[10] SWC (2010), Annual Report, Sydney Water Corporation.

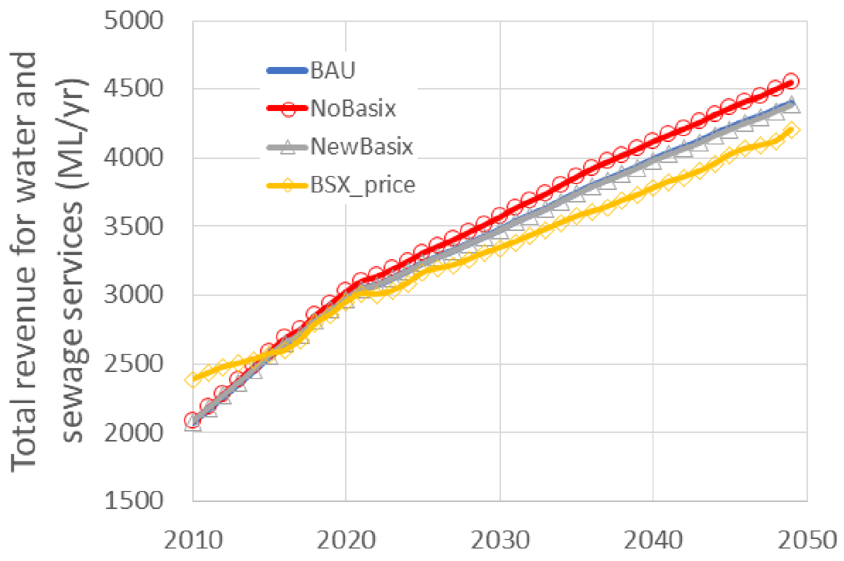

Figure 4: Total revenue for water and sewage services (in 2019 dollar values) for Greater Sydney from each option from 2010 to 2050.

Figure 4 shows that the NoBasix option earns more revenue than the BAU and NewBasix options, and the BSX_price option earns less revenue than the other options. The total annual revenue for water and sewage services earned in the BAU option increased by $2325 million (112%) to $4402 million by 2050.

Annual revenue for water and sewage services in the NoBasix option increased by $2308 million (119%) to $4552 million/annum in 2050. The reduced uptake of water efficient appliances and rainwater harvesting results in $150 million/annum additional revenue by 2050 and the utility also incurs $236 million/annum in extra costs.

The NewBasix option experiences increased annual revenue for water and sewage services of $2308 million (111%) to $4385 million/annum in 2050. This option reduces annual revenue by $16 million and annual costs by $52 million by 2050 in comparison to the BAU option in response to lower demands for utility water and sewage services.

The BSX_price option increased revenue for water and sewage services by $2127 million (102%) to $4204 million/annum by 2050. Incentives created by the full usage tariffs for water and sewage services decreased annual revenue by $198 million and annual utility costs by $615 million by 2050.

A key insight from these results is that decreased costs overwhelm diminished revenue by a factor of 2 to 8 when distributed solutions reduce demand for utility water and sewage services. Increased costs also overwhelm gains in revenue in the situation where policies supporting distributed water savings are abandoned in NoBasix.

The net present costs, revenues and benefits are summarised for the period 2010 to 2050 using a discount rate of 4% in Table 1.

Table 1: Summary of present economic values for water and sewage services to 2050

Description	Options			
	BAU	NoBasix	NewBasix	BSX_price
Utility water and sewage NPC ($m)	57,149	+3056	-1028	-6128
Utility water and sewage net present revenue ($m)	61,676	+1322	-131	-868
Utility water and sewage NPV ($m)	-	-1734	+899	+5259
Economic multiplier (Δ costs/Δ revenue)	-	2.31	7.85	7.06
Stormwater services NPC ($m) to 2050	28,501	+1414	-344	-497
Nutrient NPC ($m) to 2050	89,679	+2092	-337	-1256
Change in flood damages NPC ($m) to 2050	-	+93	-53	-69
Total economic value NPV ($m)		-5334	+1633	+7081

Table 1 demonstrates that the net present costs of utility water and sewage services increases for the NoBasix option by $3056 million, and decreases for the NewBasix option by $1028 million and by $6128 million for the BSX_price option.

The net present value of revenue earned from utility water and sewage tariffs increases by $1322 million for the NoBasix option and declines by $131 million for the NewBasix option and by $868 million for the BSX_price option.

A combination of these outcomes provides the net present benefit (a combination of costs and benefits) of utility water and sewage services declines by $1734 million for the NoBasix option, and increases for the NewBasix and BSX_price options by $897 million and $5259 million respectively.

These economic results show that the distributed water savings reduce utility costs more than any losses of revenue, and provide significant opportunities to reduce the impacts of utility tariffs on households and businesses. The addition of the economic impacts on stormwater management and the environment increase the potential economic value to society by up to $7 billion for the pricing options.

The impact of the proposed water and sewage pricing reforms by 2019 is presented in Figure 5 and the outcomes for impervious area tariffs for stormwater services is shown in Figure 6.

The full usage tariff (no fixed charges) for water and sewage services ranged from greater than $7/kL to less than $5/kL in 2019. Stormwater impervious area tariffs range from more than $1.40/m^2 to less than $0.60/m^2 in 2019.

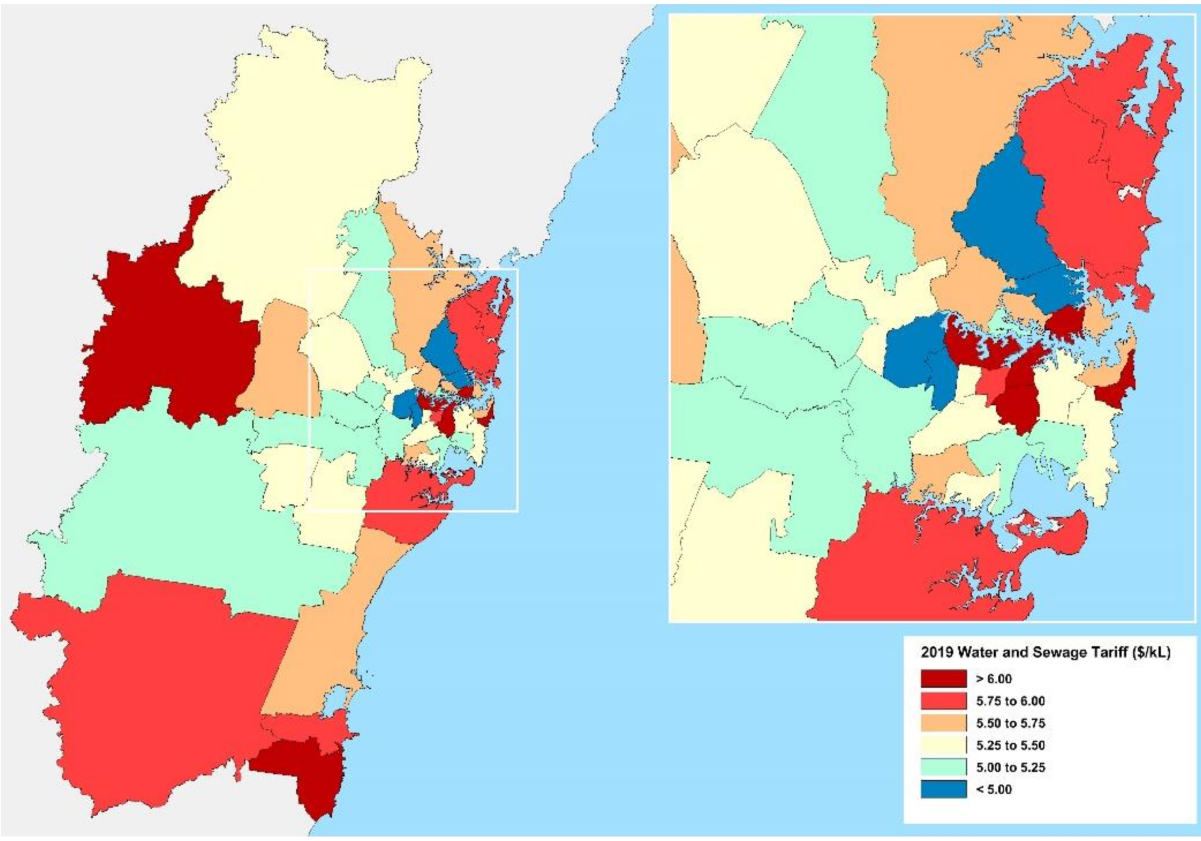

Figure 5: Spatial water and sewage tariffs for Greater Sydney in 2019

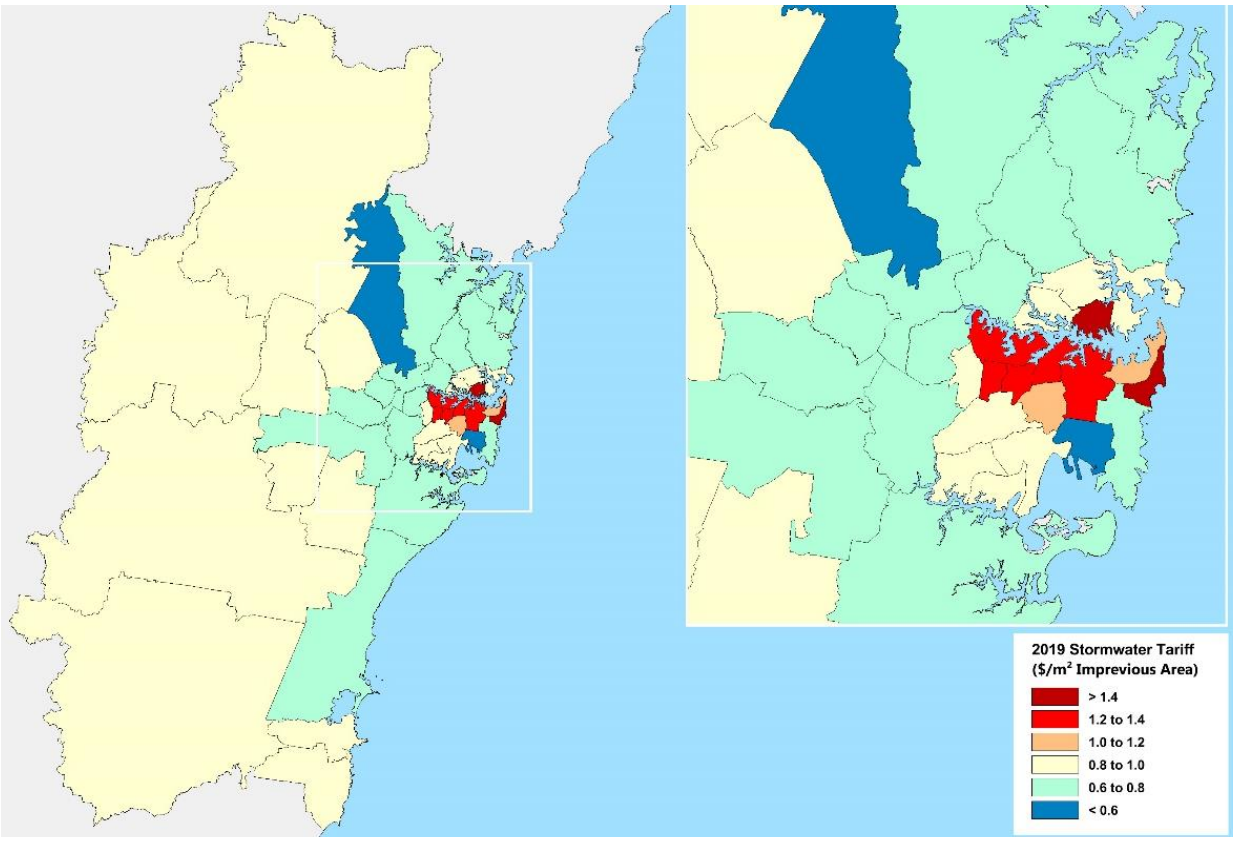

Figure 6: Spatial stormwater impervious area tariffs for Greater Sydney in 2019

9. Conclusions?

- Lack of medium-term planning and outdated modes of analysis
- Lack of transparency and openness – asymmetry of information
- The need for separation of Powers and the appropriate structure within IPART
- Lack of spatial analysis of costs and charges
- Lack of understanding of opportunity costs and opportunity value
- Lack of consideration of demand management solutions, despite the highest-level recommendations put in place after the Millennium drought
- Social inequity and economic inefficiency of reliance on fixed charges

I think we need some sentences about what the outcomes of our submission are, what do we want IPART to do?

Appendix 1 – COAG Urban Water Principles and commentary by Productivity Commission, National Water Commission and Infrastructure Australia

National Urban Water Planning Principles

National principles for urban water planning should be universally applicable when developing plans to manage the supply/demand balance of a reticulated supply for an urban population.

Key principles to achieve optimal urban water planning outcomes are:

1. Deliver urban water supplies in accordance with agreed levels of service.

   The service level for each water supply system should specify the minimum service in terms of water quantity, water quality and service provision (such as reliability and safety).

   Levels of service should not apply uniformly, but rather should be set for each supply system and potentially for different parts of an individual supply system. Agreement on levels of service will allow the community to understand how seasonal variability and climate change will impact on supply into the future and how different levels of service relate to costs. Measures undertaken to minimise risk and maximise efficiency in supplying water should be in accordance with agreed levels of service.

2. Base urban water planning on the best information available at the time and invest in acquiring information on an ongoing basis to continually improve the knowledge base.

   Up-to-date information on current and future water resources, water supplies and water demand is critical for effective urban water planning. Information on possible future changes, such as population growth and climate change, is also important in understanding the ongoing water supply/demand balance and to determine an acceptable level of risk due to uncertainty.

   Knowledge of existing customers (including who is using water, how much and for what end uses and an understanding of the differences between customers and geographic locations) is important when forecasting future water demands by end users in a particular category of use and the impact of possible demand management measures under consideration.

   Urban water planning should be based on scenario planning, incorporating uncertainty in supply and demand, as well as integrated with future economic development and land use planning to ensure full knowledge of the availability of water supplies and water savings opportunities.

   Where possible, information should be gathered in such a way that it enables improved information-sharing and research coordination between jurisdictions.

3. Adopt a partnership approach so that stakeholders are able to make an informed contribution to urban water planning, including consideration of the appropriate supply/demand balance.

   Stakeholder input is essential to ensure that the proposed levels of service and the supply and demand management options required to deliver that level of service are considered in terms of consumers' attitudes, including willingness and ability to pay.

   Community information and education programs should be an integrated part of urban water planning and should be designed appropriately, based on community input, to increase knowledge, understanding and informed participation in urban water planning, as well as increase water efficient behaviours.

   Urban water planning should be based on a process that is transparent and inclusive, recognising different consultation approaches are appropriate in different circumstances.

4. Manage water in the urban context on a whole-of-water-cycle basis.

   The management of potable water supplies should be integrated with other aspects of the urban water cycle, including stormwater management, wastewater treatment and re-use, groundwater management and the protection of public and waterway health.

   The risks associated with different parts of the urban water cycle (such as trade waste, stormwater, etc.) should be considered and managed. Water quality of potable supplies should be protected through appropriate catchment management practices and management of wastewater. This will involve a range of activities, from land use planning and management that protects the quality of natural water resources, through to addressing the disposal, treatment and reuse phases of the water cycle.

   Such an approach should result in delivery of diverse water supplies which are fit-for-purpose and optimise the use of water at different stages of the urban water cycle.

5. Consider the full portfolio of water supply and demand options.

   Selection of options for the portfolio should be made through a robust and transparent comparison of all demand and supply options, examining the social, environmental and economic costs and benefits and taking into account the specific water system characteristics. The aim is to optimise the economic, social and environmental outcomes and reduce system reliability risks, recognising that in most cases there is no one option that will provide a total solution. Readiness options should also be identified as part of contingency planning.

   Options considered could include the following: optimising the use of existing infrastructure through efficiency measures; residential, commercial and industrial demand management initiatives; purchasing or trading water entitlements from other sectors; and the development of additional centralised and/or decentralised water supply options, including manufactured water sources (such as recycling and/or desalination), where appropriate.

By considering the full range of options, access to a range of sources should be able to be optimised dynamically (even on a short term basis) through the availability of diverse infrastructures that may include both centralised and decentralised water supply schemes. These sources would be drawn upon in differing combinations depending on the local and regional climatic conditions and the mix of sources selected would be those resulting in the lowest environmental, social and economic costs over the long term.

6. Develop and manage urban water supplies within sustainable limits.

   Ensuring the ongoing protection of the environment and waterway health is an integral part of urban water planning. Natural water sources for all water supplies, such as surface and groundwater supplies, should only be developed within the limits of sustainable levels of extraction for watercourses and aquifers.

   Sustainable levels of extraction should be established through publicly available water plans prepared at a catchment and/or basin scale for all water use, including environmental requirements. In determining the sustainable extraction levels, regard should be had to the inter-relationships of different water sources.

   To ensure sustainability, extraction levels should also be monitored over time and periodically re-assessed to reflect changes in scientific knowledge and climate variability.

7. Use pricing and markets, where efficient and feasible, to help achieve planned urban water supply/demand balance.

   Tariff structures for water supplies should be designed to signal the full value of finite water resources to end users to encourage efficient water use. The price charged for urban water services should be transparent and linked to the level of service provided.

   Rights to urban water supply should be clearly defined to the extent that it is economically efficient, cost-effective and feasible to do so, at the various levels of the supply chain. This in turn will facilitate the use of markets and trading where appropriate. This could include developing bulk water and wastewater markets, removing barriers to competition and institutional, structural and governance reforms.

8. Periodically review urban water plans.

   Recognise that there is a need for periodic review of urban water plans and their underpinning assumptions. All parties involved in the development of an urban water plan should be committed to ensuring that the plan can adapt as necessary to reflect additional information/knowledge and changing circumstances.

   Planning should recognise that some demand/supply responses are short-term and are required to be adaptive, while other responses such as water infrastructure planning and investment have a longer planning horizon because the assets have a considerable lifespan.