



Early Contractor Involvement in the Water Industry

A Qubist Market Observation

Joint Paper by Iris Bienert in consultation with Jim Livas, August 2023

The current situation on the Water Market

“Climate crisis: Australia must be ready for ‘devastating’ regional disruption, MPs told” – the recent headlines of the *Guardian* is an urgent reminder of the need for effective Water Management in Australia. With weather patterns becoming increasingly severe and unpredictable and a fast-growing population, the scope of projects within the water industry is immensely vast.

Challenges on the Market – skilled labour shortages

This enormous pipeline of works faces complex obstacles that require skilful navigation. Whilst forecasts vary, according to *Infrastructure Australia*, a total expenditure of \$10Bn is forecasted for the next 10 years in the Water Industry. We consider this to be a lower bound estimate when considering population growth estimates, ageing infrastructure resulting in renewals programs and resilient water security initiatives to combat the increasing impacts of climate change. One pressing concern is the shortage of skilled labour, particularly in essential roles such as multi discipline engineers project managers, and trades workers. Solely between Project Managers and Civil Engineers, the industry faces a shortage of over 15,000 professionals, according to *Infrastructure Australia*. These professionals play crucial roles in executing projects efficiently and up to the highest standards. But also at a trades level, the shortage is equally evident, with a demand for up to 50,000 labourers and plant operators (source: *Infrastructure Australia*). The shortage of skilled labour (management and trades) has exacerbated greater turnover and competition of available workers across all infrastructure sectors. Succession planning, which has previously been able to organically nurture and reinforce the whole value chain, cannot keep up with the rapid growth and demand for talent and skills to deliver this expansive and generational portfolio of water infrastructure. Strong governance and leadership are fundamental pillars in a rapidly evolving industry. Smooth transfer of knowledge and leadership becomes imperative, especially in light of labour shortages, skill gaps and rapidly evolving regulatory hurdles.

Challenges on the Market: environmental regulations and stakeholder management

The water industry is further confronted with a diverse range of challenges that extend beyond operational and financial aspects, encompassing intricate environmental considerations. Environmental regulations have emerged as a pivotal factor, as projects must align with stringent rules aimed at protecting natural resources and ecosystems. This can lead to delays, adjustments in project scope, and increased compliance costs. Moreover, staying on top of these regulations requires specialised knowledge, a challenge compounded by the rapid evolution of environmental standards.

The complexity of the stakeholders involved in water infrastructure projects, including end users, operations, funding sources, regulators, water licencing and those geographically affected by the project, such as agricultural communities and native title holders, add to the complexity of planning and execution of such initiatives. Respecting and navigating the diverse interests of these parties is paramount and requires careful integration into project planning and execution. Striking a balance between these priorities while ensuring efficient progress presents a unique challenge, particularly considering the multitude of stakeholders involved. It's crucial to recognise that any decision in these projects can have profound impacts on people's lives, from addressing water shortages during droughts to emotionally charged consequences on the livelihoods of farmers dependent on a stable water supply.

Challenges on the Market: supply chain constraints

Supply chain constraints are causing uncertainty, as the availability of necessary materials and resources becomes increasingly unpredictable. This is further compounded by rapidly rising costs, a trend that can significantly impact project feasibility and budgets. The supply chain itself is under strain, struggling to provide meaningful and qualified offers that comply with commercial and technical requirements. The scarcity of capable and available suppliers is creating a competitive landscape marked by challenges in securing sufficient resources. Adding to these issues are competency gaps, where ensuring the right individuals are in the right positions becomes a delicate balancing act, impacting project

effectiveness and outcomes. Additionally, supply chain partners have been seeking reimbursement for tender participation and effort and in some cases seeking additional opportunity costs when projects are cancelled or indefinitely delayed. This shift underscores some of the commercial complexities and pressures reverberating throughout the industry.

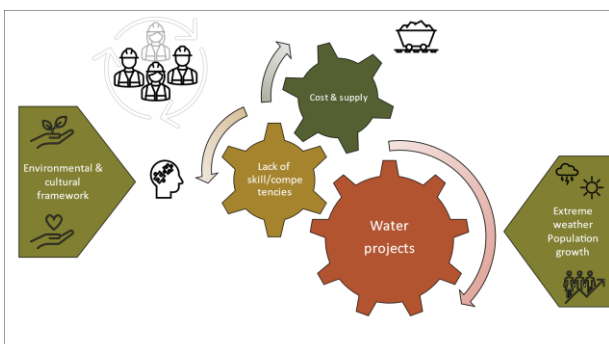
Procurement challenges:

As the water industry grapples with these multifaceted challenges as well as the pressure to deliver a significant pipeline of works in a saturated market, innovative solutions and proactive strategies are necessary to maintain momentum in delivering these crucial projects. Collaboration across sectors, upskilling initiatives, strategic partnerships, and a flexible approach to project planning are pivotal in overcoming these obstacles and shaping a resilient future for the water industry.

Procurement Challenges: Tender Process

The duration to prepare a compliant tender offer under a traditional lump sum agreement often takes many months. This is mainly due to the lump sum nature of the contract and the aim of the principal to minimise the risk of variations and delays by accurately scoping. An increased difficulty arises herein particularly in niche competency areas. Clarity of scope and interfaces is crucial to deliver a project within time and cost, even more so under a lump sum arrangement where the contractor carries most of the project risks. Fundamentally this tension often does not drive best for project behaviours and outcomes when projects become stressed. Disputes, Claims and counter claims can result in costly and lengthy delays that impact the entire supply chain and it is often the latter that is affected the most.

This becomes evident where there has been little collaboration or interaction during the Procurement process (such as open tenders) there is often quite a long tail of post tender negotiations that can take many months to clarify and resolve. This long tail also puts enormous pressure on the supply chain to maintain validities, let alone allocate and hold resources for project commencement. This typically puts projects under undue pressure from award and very often



these projects don't achieve their targets. It is a serious problem that needs addressing.

Master Planning and Project Lifecycle opportunity

The enormous work and effort required by utilities, regulators, government departments up front as part of master planning and business planning to scope up these various projects and programs, seek approvals, bundle to market and ultimately deliver is recognised broadly by the industry. Typical planning and delivery cycles average to approximately 10 years. One of the key challenges in these cycles is getting the right inputs and benchmark data at the right time. Quite often it can be difficult to get enough constructability inputs for example to calibrate benchmark rates (cost and time – productivities) as well as challenge reference designs for methodologies, risk, opportunity, and program. Whilst the engagement with Market (through more regular market soundings and Industry updates) is on the uprise, quite often a time pressure is observed to procure, deliver and handover these assets.

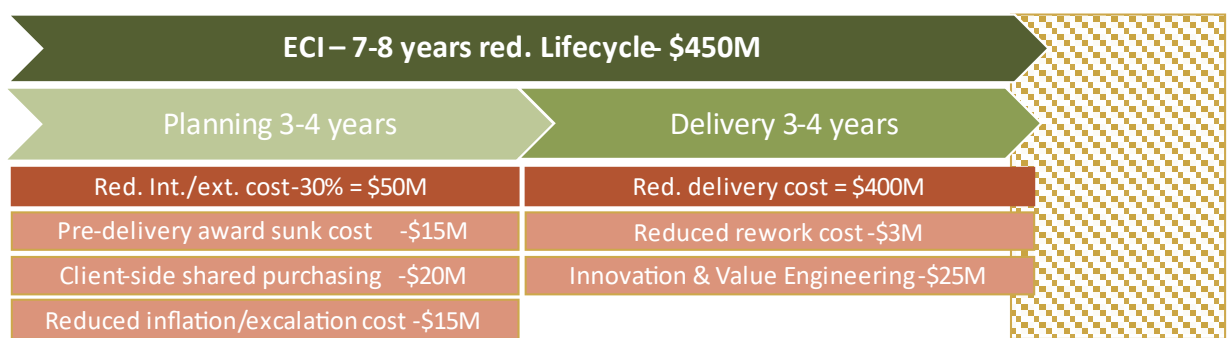
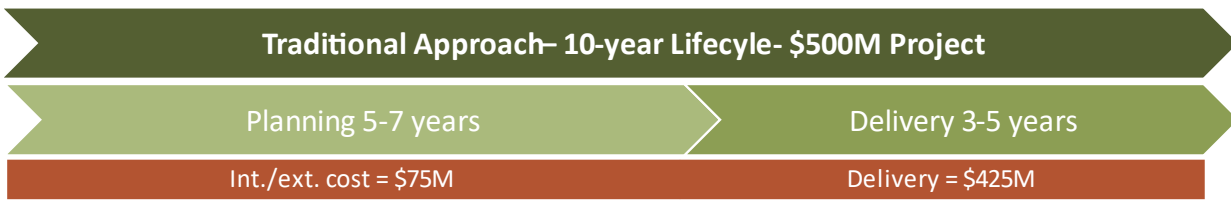
In summary, the following challenges in the procurement have been identified that put the current pipeline of projects in the water industry at risk:

- Long planning cycles, typically spanning 10 years.
- Front-end focus on approvals, business cases, and reference designs.
- Challenges with data calibration, including outdated or unsuitable benchmarks for costs and productivities.
- High input demand to Supply chain in a saturated market.
- Insufficient allowance for procurement and project delivery, including.
- commissioning, system optimisation, proving, operator training, and asset handover.
- Complexity and clarity of scope definition and equitable risk allocations,
- misalignment of budgets against scope.

Early Contractor Involvements

Rising to these challenges, the Water Industry has been moving more towards Early Contractor Involvements (ECIs that embrace a higher degree of collaboration and engagement during Tender processes).

ECIs offer a multitude of compelling benefits that significantly enhance project outcomes in various combinations. By engaging contractors at an early stage, there is a remarkable improvement in the clarity of project scope, fostering a detailed understanding of interfaces, responsibilities, and accountabilities. Risk allocation becomes more precise and transparent, ensuring that risks are effectively distributed to the parties best equipped to manage them. This approach also enables the refinement of reference designs in alignment with constructability, safety, and quality considerations, bolstering the robustness of business cases, approvals,



budgets, and timelines. The accommodation of long lead items, such as early works and novation, is streamlined, minimising potential delays and disruptions. The potential for value engineering and innovative solutions is maximised, as contractors can readily incorporate and optimise these elements within their proposals.

Bringing some engagements earlier can result in significant TOTEX (total expenditure) benefits for complex and large-scale projects and programs. For instance, involving delivery contractors during the business case development phase, which could be integrated into the Early Contractor Involvement (ECI) process, allows contractors to be selected based on criteria aligned with the business case and overall program goals. This approach aligns the business case with actual market conditions, mitigates risks, and instils confidence. Throughout this process, competitive tension is maintained by engaging two contractors or consortia under professional services agreements, which can evolve into a design and construction (D&C) delivery responsibility. The owner retains control and the flexibility to terminate the pre-award process under specified conditions, such as Value for Money or non-performance.

To illustrate the above, we have reflected on our internal Water Expert Jim Livas to help quantify some of the benefits based on his exhaustive experience as a Tier 1 Contractor in his role as pre-contracts and business development manager and based on his knowledge of industry benchmarks.

Using the example of a \$500M Major water project with a lifecycle of 10 years, the planning, reference design and procurement transaction would take circa roughly 5 to 7 years to complete and cost circa \$75M. (see chart above).

By bringing forward the engagement of a contractor via some form of ECI during the planning phase, an opportunity to reduce the time and front-end cost by circa 20-30% is possible. Potential benefits in this example summarised below:

- reduction in the program timeline by approximately 2 years.
- decrease in pre-delivery award sunk costs by approximately (\$15M).
- Client-side shared purchasing opportunities (\$20M).
- Earlier completion reducing impacts and risks from inflation and order escalation (in order of magnitude \$15M)
- reduction in rework and associated delays (\$3M)
- earlier facilitation and adoption of innovations and value engineering implementation (\$25M)

Further savings around the lifecycle of the asset can be realised through:

- Earlier savings in operational costs, such as reduced power consumption due to improved efficiencies, increased use of renewables, or sustainability enhancements in the delivered solution.
- Early implementation of Circular Economy initiatives, such as managing liquid and solid waste streams, co-digestion, cogeneration, gasification, waste-to-energy, and wastewater recycling.
- Beneficial reuse of biosolids.
- Operational flexibility, allowing optimization of performance and run times to take advantage of lower tariffs, particularly in power generation (feed in/out).
- Achieving compliance earlier, thereby reducing the risk and occurrence of license breaches and fines.

- *Reduction and elimination of emergency breakdowns.*
 - *Improved maintenance practices, including enhanced programmed maintenance in terms of time, spare parts, and consumables.*
 - *A seamless handover across the value chain in terms of people and systems, which promotes enhanced succession planning, learning, and development.*

Conclusion: ECI a proven approach to successfully tackle infrastructure procurement and delivery challenges in the water industry

There is no question that the water industry is amongst the most complex and emotionally charged environments, simply because- as we all know- “water is life”. Successful collaboration has proven to be essential in this context. Our figures aim to demonstrate that by embracing collaboration, we can effectively harness the collective expertise of both contractors and clients to successfully achieve common goals. While this approach is theoretically sound, it's important to acknowledge that true collaboration requires a transformative shift in mindset for both parties, a process that may evolve gradually rather than happening overnight.

ECI offers a balanced model that not only ensures fair remuneration but also provides a mechanism for quality control and project success. However, achieving success and tailoring ECI to meet the specific needs of each project requires careful consideration of various factors, including:

- the timing of ECI application,
- equitable risk distribution,
- Principal competence,
- appropriate compensation structures,
- the qualifications of the contractor, and
- building trust between all involved parties.

These factors merit further in-depth exploration to optimise the utilisation of ECIs. As we move toward a more collaborative contracting landscape, the lessons learned from successful implementations and the importance of addressing these key elements pave the way for a broader conversation, offering fertile ground for future exploration in subsequent papers.