Water Infrastructure Options Paper, December 2014

Tasmanian Irrigation Pty Ltd response

Executive summary

TI supports the national development option proposed in the Options Paper.

It mirrors the template that TI has used with the 10 schemes operating in the first tranche of schemes in Tasmania and the five proposed in the second tranche.

All have been developed on the PPP principle of public/private partnerships, that is, cost sharing between the public and private sectors. Inherent in PPP is the fundamental concept of community engagement.

TI not only proffers its template as the option to be adopted nationally, but also its expertise in assisting other states to build irrigation schemes following the same PPP principle. TI is prepared to do this on a cost recovery basis.

In relation to *Options to accelerate development*, this response argues that the Tasmanian Irrigation PPP model provides a template for national development. Specifically in relation to the Option Paper *Stage 4:seeking finance for capital and establishing cost recovery for ongoing maintenance (ready to go)* **TI is of the firm view that the capital contribution by irrigators for the construction of necessary on-farm infrastructure should be included in the calculation of the contribution split for scheme construction between the Commonwealth and a combined State and private sector contribution.**

Background

Tasmanian Irrigation (TI) is the state-owned company responsible for developing and operating publicly subsidised irrigation schemes in the state.

The primary aim of TI's schemes is to grow Tasmania's wealth by developing and enhancing the productive capacity of the state's agricultural industries.

TI develops schemes as public-private partnerships. It means that TI works closely with private landholders to determine the demand for new water. The cost of building a scheme to meet that demand is shared between the public and the private sector. The public funding contribution recognises that the wider community will benefit from increased economic activity and employment over time.

Private capital contributions are made through the purchase of tradeable water entitlements. Ongoing operating costs, including provision for asset renewal, are not subsidised and are met by annual charges levied on water entitlement holders.

TI provides the technical, financial and project management skills to progress schemes from concept development through feasibility and construction to operations. All TI schemes are designed to last 100 years, deliver water at an average reliability of greater than 95 per cent and are built to satisfy demand in each region.

Response

The Commonwealth's Options Paper outlines four stages for project assessment and development.

1. Assessing demand and general feasibility, including location
2. assessing economic feasibility through benefit cost analysis
3. gaining approvals and assessments
4. seeking finance for capital and establishing cost recovery for ongoing maintenance.

These stages closely mirror the approach that TI has adopted, successfully. Fundamental to all stages is the principle of public/private partnerships (PPP), in which, once demand is established, the development cost is shared between private irrigators, the Australian Government and the relevant state government.

In relation to the Option Paper *Stage 4:seeking finance for capital and establishing cost recovery for ongoing maintenance (ready to go)*, as mentioned above, TI is of the firm view that the capital contribution by irrigators for the construction of necessary on-farm infrastructure should be included in the calculation of the contribution split for scheme construction between the Commonwealth and a combined State and private sector contribution.

An example of this contribution split , the following example is based on total capital required for TI's proposed Tranche Two as submitted to Infrastructure Australia.

This project is estimated to total circa $413 million.

This amount comprises of a direct contribution of $193 million from the State and Federal Governments together with irrigator investment for the construction of necessary infrastructure and an additional capital investment from private sector irrigators for on-farm infrastructure to the remaining sum of $220 million.

Accordingly, a breakdown of proposed Tranche Two, contribution is as follows;

- 13%, or $53 million private sector (irrigator and investors) contribution by the way of direct purchase of Water Entitlements
- 53% or $220 million private sector (irrigator) contribution into on-farm irrigation infrastructure
- 7% or $30 million State Government contribution
- 27% or $110 million Federal Government contribution

Tasmanian Irrigation's modus operandi

The first stage for any scheme development in Tasmania is to identify a possible irrigation hotspot, determine if it is technically feasible, economically viable, environmentally sustainable and it has a social licence.

Economic viability
Based on the region's existing agricultural activities, each scheme must show that it will generate more wealth at the farm gate than the combined costs of construction and operation. Otherwise, it doesn't get to first base.

Environmental sustainability
The water resource and the irrigation infrastructure must harmonise with the landscape. TI's demands exceed the requirements of local, state and national regulations. Scheme hydrology, for instance, is tested against the CSIRO's future climate models. Water can only be applied to the land according to an approved farm water access plan that has water, soil and biodiversity modules.

Social licence

It means the local community has to support it. To support it, the community must be engaged. TI sits on the same side of the table as the community it partners. If a community does not want a scheme, Tasmanian Irrigation does not seek to coerce. Community engagement is key to any successful scheme.

Tasmanian Irrigation's five development phases

1. Prefeasibility
2. Feasibility
3. Detailed design and approvals
4. Construction
5. Operation

In the **prefeasibility** stage, TI defines a preferred option for a scheme. The Tasmanian Government must approve the preferred option to allow a business case to be prepared. In many senses it is the critical phase because it requires:

- expressions of interest by irrigators for water entitlements
- preliminary assessments of land capability, pipeline alignments and dam sites
- basic design
- detailed feasibility studies that include environmental flows, stream geomorphology, hydrology (including sustainable yield impacts), flora and fauna, cultural heritage and geotechnical
- preliminary engineering design and cost estimates
- a socio-economic report.

In the **feasibility** stage, the business case is progressed to the point where the government may approve it with set conditions.

Once the detailed design is complete, state and local governments must approve its construction.

Evaluating an irrigation scheme

Each is subjected to a detailed economic assessment. It analyses the main economic outcomes expected from the completed scheme and quantifies the risks. This involves examining the benefits stream and full life-cycle costs. If the difference between the two is positive, the project is deemed to deliver net benefits to Tasmania and the nation.

TI commissions financial and economic consultants to review the methodology of assessing the socio-economic values of new irrigation schemes. Their report describes all stages of a comprehensive socio-economic assessment, from data collection to financial and economic modelling of the scheme's performance. It also offers a basis for a scheme's demographic profiling.

Estimates of cost

The cost of a project includes:

- capital costs of the project plus capital costs of other direct beneficiaries
- its operating, maintenance, administration and refurbishment costs, regulatory, licensing and compliance costs
- increase in operating costs of irrigators and primary processors
- loss of income from "without case" (i.e., the situation without the project proceeding)
- environmental impacts (to the extent that a monetary value can be estimated).

Capital development costs

The capital development cost estimate derives from engineering cost data reported in the planning documents that are commissioned in the feasibility and pre-feasibility assessments.

Items assessed in the capital development cost estimate include pipelines, dams, mini hydro scheme add-ons, pump stations, land purchases, compensation, fittings, planning and design and a level of contingency. The level of contingency is consistent with recommendations in professional standards for engineers.

Operating costs

Operating costs are variable (pumping costs, water purchase) and fixed (scheme management, overheads and maintenance, asset refurbishment) costs.

Asset refurbishment and maintenance

These estimates are often presented as an annual equivalent amount and expressed as a percentage of the capital cost (e.g., one per cent of the purchase price of pumps, and 0.5 per cent for pipes). Alternatively, these costs can be directly included in the cost model by identifying the forecast timing and value of the cost. The former method, while less precise, is often preferred, given the uncertainty about the future maintenance and refurbishment schedule.

Economic benefit estimates

An irrigation scheme may have a number of direct economic benefits attributable to it:

- the returns to irrigators represented by estimated margins per ML for the principal crop and livestock enterprises
- returns for mini-hydro stations.

There may also be economic benefits associated with recreational uses of water supplies and positive environmental impacts.

Enterprise margins

Margins, expressed as dollars per ML, represent the economic value of water to irrigators (or other consumptive uses), and are specific to the type of crop or consumptive use.

We calculate an enterprise margin using an economic model of a farm enterprise to produce an estimate of farm profits (net of all capital costs). This profit can be expressed as a profit per hectare (say, $1000 per ha for crop A) and, in turn, the margin per ML can be estimated. If crop A requires 5 ML per annum, then the margin for crop A is $200 per ML.

The enterprise mix and farm margins for each supply zone are used to estimate the weighted average farm margin that is used to estimate the benefits from use of water in the economic model.

Adjustments to margins include:

- the capital cost of developing irrigation and other infrastructure'
- the cost of on-farm storages.

In addition, the dryland returns must be deducted, as the aim is to determine the benefit from using water that can only be realised if water is supplied.

Demand estimate

For each irrigation scheme, a standard demand assessment is undertaken reviewing land capability, existing water supplies, farm surveys and economic returns from irrigation enterprises suited to the region. The demand assessment will provide an estimate of:

- the total volumetric demand for a region
- the rate of uptake (water entitlements and usage) and
- the key risk factors that could lead to either the sale of water rights or the overall usage level being less than predicted.

The demand uptake rate impacts significantly on the present value estimate of each irrigation scheme's benefits and costs. A slow uptake rate in terms of the usage of water entitlements impacts the economic performance of the scheme as this determines the rate at which economic benefits (or margins) from water use are achieved.

It is predicted water usage uptake will be most rapid where irrigators already have irrigation skills, existing infrastructure and equipment. If there are high levels of latent demand and strong demand relative to the overall volume of new water, then it is reasonable to expect a rapid uptake rate. An element of judgement will be required about the uptake rate. However, indications of high uptake rate include:

- high volumetric demand relative to scheme capacity
- high-value crops
- well-established irrigation areas/skills
- availability of capital (if farmers have low debt levels this may reduce inertia in the uptake rate).

Other issues to take into account in assessing the uptake rate include:

- attitudes to irrigation – some graziers may prefer not to switch to irrigation. This issue can be overcome by operators with irrigation skills leasing land from graziers. However, in some cases, the switch to irrigation may not occur until the property is sold. The higher returns from irrigation are factored into the purchase price and the new owner will generally need to move into irrigation to achieve a reasonable return on the investment
- indicative sale price for water entitlements (impacts uptake of water entitlements)

- indicative annual water charges (impacts usage uptake rate).

Economic flow-on and employment effects

For the economic evaluation, a standard government discount rate for project evaluation is applied – typically six per cent.

TI undertakes its economic assessment assuming a 40-year evaluation period.

Each assessment includes a range of sensitivity tests on key variables of the analysis.

Typically, these sensitivity tests include:

- capital development costs (+/-10 per cent)
- operating costs (+/-10 per cent)
- enterprise margins (+/-10 per cent)
- discount rate (five per cent, seven per cent)
- demand sensitivities (slow uptake, rapid uptake).

For some projects, there may be other relevant sensitivity tests that should be undertaken. For example, if a mini hydro scheme is included, the economic costs and benefits of including the scheme should be assessed for a range of throughput volumes and electricity prices.

Threshold analysis may also be undertaken for an irrigation project. This involves calculating the amount by which economic model variables can change before the project is no longer economically viable or generates net economic losses. This is an important part of the analysis because it informs us about the economic risks of the project.

Conclusion

TI has a proven formula for developing viable irrigation schemes, the essence of which is a business partnership between the public and private sectors and full community engagement to ascertain demand, design and social licence.

TI not only proffers its template as the option to be adopted nationally, but also its expertise in assisting other states to build irrigation schemes following the same PPP principle. TI is prepared to do this on a cost recovery basis.

TI remains of the view that public contribution to irrigation infrastructure, with operating costs being fully net by irrigators, is a model that will deliver strong economic and importantly, social returns to Australia.

To further develop the TI approach, the basis of the economic argument pursued by the company is that new irrigation projects must be proven to be economic at the State level and financial at the farm level. Where a gap exists between these two levels (given the different discount rates and payback periods between the public and the private farming sectors), a public contribution is justified as it is in fact a commercially sound investment into the nation. TI also argues that such public investment is critically important in the development and support of regional communities, and that it is only a public contribution that in many circumstances that can bridge this gap as detailed above. It also needs to be noted that irrigation schemes developed by TI with a 100 year life are multi generational investments and as such, some additional capacity may be built into the schemes at the time of construction, albeit limited, that may take on average take an additional five years to be fully subscribed.