

Document tabled
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Summary of what's needed to fix the engineering skills gap.

The four essential reforms:

1. **A reformed procurement process.** The procurement process for complex infrastructure projects is broken. It must be reformed so that infrastructure investment drives engineering capability and better project delivery. Improved investment in real world projects will ensure industry is able to support the cadets and other workforce development programs required. A *Procurement Unit* should be established to ensure investment in infrastructure is not wasted due to State and Territory Governments being uninformed purchasers, as was found in the BER Taskforce Final Report. This is about ensuring that taxpayer's dollars aren't wasted. This has also been broadly recommended by the State Opposition in Victoria. This unit should also conduct an audit of Federal Government engineering competence and put in place career paths and senior technical roles within the APS to ensure there is capacity to deliver infrastructure.
2. **Industry wide buy-in to Engineering workforce development.** There is a gaping hole in the national architecture of industry driven skills development, namely in engineering. Currently engineering is covered by 9 ISCs, with no or little coordination between them. This gap should be filled by a body based on the successful ISC model for trades, but operating across sectors. This would ensure economy wide outcomes, responsiveness and flexibility in engineering workforce development while ensuring smooth transition in education between sectors. An *Engineering Workforce Development Council* should be established to assess engineering supply/demand at economy and industry level; develop, accredit and market appropriate courses and practices, and; provide advice to the *Procurement Unit* to ensure cost efficient, needs based investments in industry lead training and development activities.
3. **An Engineering Education Tax incentive.** Engineers operate in a fast-moving profession that creates infrastructure, technology and design innovations with a multiplier effect on the economy: creating jobs and building capacity. Peak productivity is achieved when the people in these roles have up-to-date skills, in technical fields and engineering project execution.

Australia must be proactive to keep its edge in the global marketplace, both in traditional engineering services and to capitalise on its experience running large mining and infrastructure projects like Gorgon and the NBN.

To do this, we require greater investment in education and training for engineers. At the school and university levels, investment in STEM fields of education—science, technology, engineering and mathematics—are being tackled. In contrast, market failures have led to a decline in training at the workplace that is only now being felt and requires greater attention.

The market failure arises because when government-owned technical service agencies were privatised in the 1990s, their de facto roles as crucibles of engineer development were shifted to the private sector without acknowledgement of the true cost (and value) of that ongoing investment in human capital.

An Engineering Education and Training (EET) Tax Incentive is a sustainable mechanism to address the market failure, and develop the workforce of the future. It will make training more accessible to engineers working in small businesses, to the large number of engineers in regional and remote areas, and to engineers in the large world-leading companies exporting Australian services abroad.

4. **More industry-lead cadetships.** The engineering skills gap is about work-readiness, not the number of students or graduates. "Cadetship" is the proven model to ensure graduates are able to hit the ground running. We need more cadets and more industry buy in. The Australian Power Institute (API) bursary program provides the good example of industry lead cadetships (bursaries) and should be mainstreamed for all publicly funded infrastructure sectors.

Some detail:

The consequences

Among the findings of the Senate inquiry is the fact that Governments do not have sufficient engineering expertise to ensure that they are informed purchasers of services. The consequences of this are well documented in the report and include:

- wasted investment,
- delays,
- disputes,
- and failed and faulty infrastructure.

The cause

The report provides a comprehensive account of the problem but in essence it can be summarised as a labour market failure leading to under development and underutilisation of engineering expertise. The problem is not one of student and graduate numbers (though this should be improved) but rather of the work readiness of graduates and the productive use of existing skills within the labour market.

Actions that will fix the problem

In order to fix this we need a mechanism to safeguard infrastructure investment and to ensure spending drives engineering workforce development. The two go hand in glove. Engineers find cost effective and technically sound solutions to infrastructure problems. They do the problem solving that complex projects need. Ensuring investment includes provision for project appropriate engineering workforce development activities will mean specific projects:

- provide employment of cadets and the like, with asset owners, construction and consulting companies;

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- that engineers are provided workplace based training and development;
- that they are supported to assist on the job learning and development of new and less experienced engineers
- that migrant engineers and other groups of underemployed engineers are provided opportunity for workplace based learning and adjustment

Such measures will result in genuine and sustainable workforce development. Asset owners, consultants and constructors would participate and benefit, and ultimately communities and businesses would receive better and more cost efficient infrastructure leading to increased productivity overall.

To ensure the system for procurement of complex infrastructure projects is geared to deliver quality infrastructure and the engineering capability that will provide this, we need to leverage project investment in a targeted way. The best means for doing this and for enlisting all parts of the infrastructure delivery train is through:

- a *Government Procurement Unit*, to make project specific recommendations on best practice workforce development investments. Point 1 (above)
- an *Engineering Workforce Development Council*, based on the successful ISC model, to provide expert advice and access to the best forms of workforce development practice, including industry-lead cadetships, as appropriate to specific projects and current and emerging industry needs. Point 2 (above)
- an *Engineering Education Tax incentive*. Point 3 (above)