



KEY QUESTIONS FOR DEFENCE IN THE 21ST CENTURY'

The Australian Academy of Technological Sciences and Engineering (ATSE) is pleased to respond to the Public Discussion Paper and welcomes the preparation of a Defence White Paper. This Submission is confined to ATSE's mission of fostering the development and application of technology that will improve and sustain our society and economy.

- **ATSE considers that, there are significant opportunities to expand or develop high technology defence supply industries capable of servicing civilian markets if more support is provided for research through the Defence budget.**
- **A 'win-win' scenario is possible if support is provided for the development of new defence related technology locally as it will improve the performance and cost effectiveness of the ADF at the same time underpins the growth of new high technology industries in Australia.**
- **A strategic approach to expanding the Defence research budget is needed, starting with a comprehensive audit of research requirements and an analysis as to how these can be met.**
- **A Defence Research and Technology Plan needs to address how Defence research expenditure can be more effectively used to leverage funds from elsewhere and how it can be better integrated into more mainstream research activities taking place in public and private enterprises.**
- **Should the Defence Research budget be expanded it will need to be accompanied by well managed assessment and monitoring programs.**

1. A well-managed investment by the Defence sector in research and new technology development will potentially benefit both the performance of the ADF and of Australian high technology industries.

The vast majority of technology employed by the ADF is purchased embodied in equipment that is either imported or through Australian defence industry suppliers using restricted licensing arrangements from overseas. With a few notable exceptions very little new technology has been developed within private industry specifically for defence customers.

DSTO has undertaken high quality research, which has found application within the ADF but forms a niche area only; other publicly funded research agencies have made minor contributions at best.

The reasons for this situation is fairly similar to the challenges facing business investment in research and new technology development in most other sectors, small local demand, ease of acquiring technology from their parent or associated companies by overseas owned subsidiaries, lack of early stage funding available to commercialise research and an industry base that is not heavily populated with research intensive businesses.

Compared with many OECD countries this situation has disadvantaged Australian industry. In general it has been denied the considerable benefits seen elsewhere of new high technology industries being developed and sustained by the defence budget investing in research and development in the private sector, in areas where there are spin-off civilian market opportunities.

To underpin economic growth, the creation of high skill jobs and to assist in addressing external trade issues, ATSE would very much like to see the White Paper guide policy towards a win-win situation that will benefit both the performance and cost effectiveness of the ADF but also grow Australia's high technology industry base.

2. The White Paper should specifically recommend a multi-stage program to expand the development of new technology in Australia supported by defence needs initially but capable of finding broader market applications.

While the Australian market and its defence industry are not big enough to support large-scale technology developments for new platforms, systems or major equipment, there is likely to be a large number of smaller scale developments possible.

ATSE proposes a major *Research Requirements Audit* of the Defence Department be undertaken. This could be undertaken by a small taskforce from Defence Materiel, DSTO, CSIRO and private enterprise researchers. The task would be to systematically work through the ADF operations to identify where current technology is deficient, inappropriate or unavailable. This would cover the whole range of requirements from uniforms to weapons systems.

The resulting report would define technology problems and opportunities that are:

- Beyond the capacity of Australian researchers or industry to address.
- Security sensitive to the extent that DSTO alone should be tasked to address them.
- Security sensitive but capable of being packaged so outside researchers could undertake the work and seek spin-off non-military applications under agreed rules.
- Problem solving or performance improvements where Defence would have priority access to IP but the developer would be free to seek other commercial opportunities.

- Other needs that could be best handled through open tender.

3. The White Paper should specify a Defence R&D Plan and a Defence Technology Plan separately from procurement plans.

R&D and Technology Plans should include both the results of the *Research Requirements Audit* and those aspects of major equipment purchases where there are opportunities for including Australian technology developers. These Plans would be costed, prioritised and appropriate budget provision made for the necessary outlays on research, development and demonstration.

ATSE suggests that outlays for R&D as a percentage of total Defence expenditure be benchmarked against comparable countries elsewhere.

4. Defence R&D Plan, which would include DSTO Plans, would define a number of Performance Indicators to assess its effectiveness, including any commercial opportunities or technology sales that have arisen.

In the Defence R&D Budget, it is essential that adequate controls of expenditure be implemented, well-considered milestones and decision points defined and success indicators identified. In particular the contribution Defence R&D expenditure makes to technology uptake in non-Defence areas needs to be monitored.

5. Defence R&D need to be better integrated with other public and private sector research programs.

Much defence related research appears to be segregated from other research in universities, PFRAs or industry. This runs the risk of missing opportunities for synergies or realising the full potential of new discoveries.

The Defence R&D Budget should attempt to leverage funding from other government and non-government sources. Involvement in ARC Linkage grants, the CRC Program and the current range of energy related programs must be encouraged.

6. The Defence-related research potential of academic staff in the Australian Defence Force Academy.

ATSE considers that the Defence Force should encourage more defence related R&D to be completed by Australian Defence Force Academy (ADFA) academics as this would inform their teaching and deliver beneficial attitudes towards innovation in defence materiel to their students. Whilst DSTO does support some limited collaborative research in Australia, ATSE encourages Defence to greatly improve its relationship with ADFA and other Australian public sector researchers.