

REPORT ON PROCEEDINGS BEFORE

STANDING COMMITTEE ON STATE DEVELOPMENT

DEFENCE INDUSTRY IN NEW SOUTH WALES

At Macquarie Room, Parliament House, Sydney on Wednesday, 4 April 2018

The Committee met at 9:30 am

CORRECTED

PRESENT

The Hon. Taylor Martin (Chair)

The Hon. John Graham

The Hon. Paul Green

The Hon. Natasha Maclaren-Jones

The Hon. Mick Veitch

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The CHAIR: Welcome to the final public hearing of the Standing Committee on State Development inquiry into the defence industry in New South Wales. Before I commence I acknowledge the Gadigal people who are the traditional custodians of the land. I pay respect to elders past and present of the Eora nation and extend that respect to other Aboriginals present here today. Today's hearing will take the form of a public roundtable discussion and follows a series of public hearings, site visits and the release of a discussion paper on the New South Wales defence industry last year. It is intended that today's session will provide the opportunity for an interactive discussion amongst the Committee and industry stakeholders. The discussion will concern potential initiatives or recommendations that will deliver the most value to the State's defence industry, and therefore, promote economic growth throughout New South Wales.

The roundtable today will consist of three separate sessions. The first two sessions will focus on supporting defence industry growth in New South Wales. The third and final session will focus on defence industry research and innovation, including the space capability of New South Wales. A range of stakeholders from industry, academia and government have been invited to contribute. I thank all those participating today for their time and valuable insights into the workings of the defence industry throughout our State.

Before we commence I will make some brief comments about the procedures for the today's roundtable. At each of today's sessions Committee members will invite participants to discuss a series of questions. Participants may respond even if questions have been directed to other panel members if they feel they can make a valuable contribution to this inquiry. I ask that all participants be mindful of Hansard reporters today, given the large number of witnesses participating. Please speak clearly into the microphones and avoid speaking over others. Today's roundtable is open to the public and is being broadcast live the Parliament's website. A transcript of today's roundtable will be placed on the Committee's website when it becomes available.

In accordance with the broadcasting guidelines, while members of the media may film or record Committee members and witnesses, people in the public gallery should not be the primary focus of any filming or photography. I also remind media representatives who may be here throughout the day that they must take responsibility for what they publish about the Committee's proceedings. It is important to remember that parliamentary privilege does not apply to what witnesses may say outside of their evidence at the hearing. I urge witnesses to be careful about any comments they make to the media or others after giving evidence today as such comments are not protected by parliamentary privilege if another person were to decide to take action for defamation if such an event arises. The guidelines for broadcast of the proceedings are available from the secretariat.

There may be some questions a witness could only answer if they had more time or with certain documents at hand. In these circumstances, witnesses are advised that they can take a question on notice and provide an answer within 21 days. Witnesses are advised that any messages should be delivered to the Committee members through the Committee staff. To aid in the audibility of this hearing I remind Committee members and witnesses to speak into the microphones. In addition, several seats have been reserved near the front of the gallery with loudspeakers nearby for those with hearing difficulties. Finally, I ask everyone to turn their mobile phones to silent for the duration of this roundtable.

PETER SCOTT, CSC, RANR, Director, Defence NSW, on former oath

DUNCAN CHALLEN, Executive Director, Industry Development, NSW Department of Industry, on former oath

ANNA MURRAY, NSW Vice-President, Australian Industry and Defence Network, affirmed and examined

EVELYN NORDHOFF, Defence Industry Facilitator—New South Wales, Centre for Defence Industry Capability, sworn and examined

TRENT GOLDSACK, Business Adviser, Centre for Defence Industry Capability, sworn and examined

CHRIS WILLIAMS, Chair, Sydney Aerospace and Defence Interest Group, and Member of Centre for Defence Industry Capability Advisory Board, on former oath

STEWART NOEL, Executive, Sydney Aerospace and Defence Interest Group, sworn and examined

THERESE O'DWYER, Acting Executive Officer, Regional Development Australia, Sydney, sworn and examined

The CHAIR: I welcome the participants in today's first group. Commodore Scott, Mr Challen and Mr Williams do not need to be sworn, as they have sworn an oath at an earlier hearing. To provide the maximum amount of time for questions I request that opening statements be limited to no more than a couple of minutes.

Mr CHALLEN: I am representing Simon Draper, our Secretary for the Department of Industry. He wanted to be here to show support for the defence inquiry and the defence sector. He is not available. I will read a brief statement from him. I personally thank the Committee. We were here on 3 August 2017 when we kick-started the inquiry. I thank you for the focus and tireless efforts in terms of the level of engagement that you have been able to complete through the inquiry, both the metro and also regional New South Wales. You have really helped us lift the focus on to defence and defence industries. Your support has been critical for us to drive implementation of the defence industry strategy: smart, strong and connected. I acknowledge and thank all your efforts.

We are pleased with the quality of submissions provided by industry, the level of engagement and the feedback we have received so far. Again, congratulations and we look forward to the final report. On behalf of Simon Smith, he apologises. He is very pleased that Air Marshal John Harvey, Commodore Peter Scott and the Acting Chief Scientist Chris Armstrong are here to support the New South Wales Government in the inquiry. Simon Draper recognises the importance of the substantial defence presence and related industries across the State to both the Commonwealth Government and New South Wales. Our commitment to the growth of the defence sector is affirmed by the "New South Wales Government and Defence Industry Strategy: Strong, smart and connected", released in February 2017, and is reaffirmed by a previous appearance at this inquiry.

Through Defence NSW the New South Wales Government is championing opportunities for the industry across the State. Last year we announced a partnership to reactivate the ship repair facility at Carrington and reinvigorate maritime sustainment in the Newcastle region. The NSW Government was also the platinum sponsor in August of the HunterNet Defence Conference and the principal sponsor at Pacific 2017 in October. At Pacific 2017 we exhibited, along with industry networks and 14 small- and medium-sized enterprises [SMEs], to promote our specialist regional capabilities. The New South Wales Government launched the Defence Innovation Network in November to strengthen the research and development across the State in defence priority areas such as trusted autonomous systems, advice materials and manufacturing techniques, as well as cybersecurity.

The New South Wales sponsored partnership with the Defence Science and Technology Group and seven world-class universities is enhancing the collaboration with industry to enable fast developments and commercialisation of defence-related technologies. The New South Wales Government also supports the New South Wales defence industry through the advocacy of sovereign capabilities to both domestic and international audiences. These include the world-class sonar system developed by Thales Australia in Rydalmere and the military grade steel production achieved by Bluescope Bizoil in Port Kembla.

The Premier visited Thales in February 2017 to observe the world-leading sonar capabilities developed and manufactured in Western Sydney. The Government has also advocated for broader industry opportunities such as the creation of the Asia Pacific Regional Sustainment hub for the Joint Strike Fighter at Williamstown. In December the Premier visited the Lead in Fighter Management Facility in Williamstown and observed the local STEMship program in action. The New South Wales Government is partnering with Regional Development

Australia and the defence industry to deliver this outstanding program in the Hunter region which is enabling young people to develop defence sector skills and equipping them for the jobs of the future.

The New South Wales Department of Industry is committed to achieving meaningful collaboration on defence issues. Defence NSW works with other New South Wales Government agencies, Navy and Defence to ensure Navy requirements are taken into account in the development of the Garden Island defence precinct. Two weeks ago the defence advocates from all the States and Territories met with the Minister for Defence to discuss options to better harmonise activities to achieve a true national approach to supporting defence, one of the key themes of the New South Wales strategy.

Further, the New South Wales Government is actively promoting an aerospace and defence industry precinct in the vicinity of the new Western Sydney airport. The Premier will be holding an aerotropolis investor forum to support this work in May 2018. The precinct which Northrop Grumman has committed to as an active tenant positions New South Wales to continue as Australia's leading State in the delivery of complex defence systems. I would like to thank the inquiry for examining in detail the issues affecting defence industries in New South Wales. We welcome the opportunity to appear before the inquiry and provide other departmental support as required to assist in the conduct of the inquiry.

Just to conclude as well in terms of some of the other support that the New South Wales Government is providing to the defence industries, we are also working very closely with Advance Manufacturers with the development of our Advance Manufacturing Strategy which will be released over the next few months. In particular it will focus on supporting start-ups and SMEs. It will look at building skills and capabilities of the future. It will also help SMEs in terms of accessing global supply chains. It will also look at building general capabilities across the sector which will have a flow on benefit to the defence sector. On behalf of the New South Wales Government, that is our opening statement. Again I congratulate the inquiry and we look forward to the final recommendations.

Mr SCOTT: I do not have anything to add at this stage.

Ms MURRAY: I represent AIDN NSW, our President Medhat Wassef and our executive committee. As per our submission, we represent SMEs throughout the State not only into defence but also into some of the prime contractors as well. We welcome the new strategy for defence and the inquiry into defence industry, and we believe that it is crucial that the New South Wales Government gets involved at the highest level in defence issues, which to date we have not really seen. We believe that defence is not actually getting represented enough attention from the New South Wales Government at the moment, so we welcome this as an opportunity to change. We believe we are losing out to other States that have more and higher representation from their government level. We believe that the share for New South Wales SMEs is actually getting smaller because of our lack of attention to it. We have the capability. We have a lot, as Mr Challen alluded to, of very smart SMEs. We have a lot of capability here and a lot of very innovative small companies and they will greatly benefit from some assistance and attention from the New South Wales Government into defence industry.

Mr GOLDSACK: I thank the Committee for inviting the Centre for Defence Industry Capability [CDIC] to provide input at this roundtable. I would like to introduce my colleague Evelyn Nordhoff and we are both representatives of the CDIC today. To give a bit of background, the CDIC is the Federal Government's transformational program for positioning Australian industry to meet defence's current and future capability needs. To do that, we provide advisory and facilitation services to defence sector small to medium enterprises to improve business management skills, development, innovation and access to export initiatives and international and domestic supply chains. We support new entrants into the defence industry offering specific facilitation for defence market preparedness and a road map to further defence industry involvement and services to assist defence industries, SMEs and to upskill their workforce.

CDIC also provides strategic advice to government and key sector stakeholders on a development of a sustainable defence industry in line with Australia's defence priorities, and identifies strategic industry capability gaps and solutions. CDIC is delivered—as an interesting quirk here—by the Department of Industry, Innovation and Science on behalf of the Department of Defence. As a Federal Government program we are not representatives of industry, but rather subject matter experts in the Australian industry base, supplying and sustaining defence capability. Our remit as public servants is to provide strategic advice and tailor support for businesses to enter and grow within the Australian defence industry. Our comments today will be based on our experience working with defence industry participants rather than personal opinions regarding the state of industry development in Australia which are more appropriately answered by the Department of Defence.

Ms Evelyn Nordhoff is a Defence Industry Facilitator who is located in Sydney and engages with the State and Territory governments and regional stakeholders. CDIC defence industry facilitators have a comprehensive understanding of regional networks, events and business conditions enabling the CDIC to

provide relevant advice and facilitation activities. Facilitators also analyse company workforce skills needs in line with defence opportunities and provide guidance to businesses that are new to the defence sector.

As a business adviser working out of the Sydney office, I provide comprehensive advisory services tailored to the specific needs of a business—the emphasis being provision of defence specific advice or defence business guidance. CDIC advisers guide business through business improvement activities to become more competitive and to take advantage of growth opportunities, improve their access to domestic defence supply chains and work with CDIC exports and global markets teams to identify global supply chain opportunities. Specialist advisers also deliver the supply continuous improvement program to assist businesses, standardise processes, modernise business relationships, improve business communications, increase efficiency and increase innovation.

Importantly, the CDIC advisory and facilitation team collectively has extensive defence and private sector experience across business management, skills development, innovation collaboration, export activities and supply chain facilitation. They work closely with Defence, defence projects, prime contractors, research institutions and Commonwealth, State and Territory agencies building a network of knowledge and relationships that facilitates the relationships between industry and defence. We are both based in New South Wales but service the national footprint of the CDIC. Our national presence, with the experience and expertise of our advisory and facilitation staff means that they are often travelling to where demand is in Australia rather than focusing on a single geographic area.

As part of the Department of Industry, Innovation and Science we are also able to leverage the broader network of the AusIndustry advisers across Australia. I would like to preface my response by reminding the roundtable that although I and Evelyn are not industry representatives, we can provide our perspective as government facilitators and advisers dealing with businesses primarily in the New South Wales region.

The Hon. JOHN GRAHAM: I turn to what is essentially driving this inquiry politically, which has been referred to already: the New South Wales share of defence expenditure. In the Committee's documentation it is reported as being 26 per cent of the employment and a little lower on defence expenditure. Obviously we have a third of the population, about a third of the economic activity, so it is lower than you could hope. There are some reasons for that. Naturally a lot of the defence of the country is based in the north of the country. I am interested in any views you would like to put on the record early on, and this is really to Mr Callen or Commodore Scott in the first instance. Can you give us some background about that share of the expenditure, particularly where you hope it might be? What is our goal, given where we are at the moment?

Mr SCOTT: I would start my comments there by looking at defence presence. I think actual Australian Defence Force [ADF] presence on the ground is the fundamental long-term driver of associated defence industry. The defence presence to date is that about 26 per cent of the ADF is resident here in New South Wales. Defence presence decisions are made principally by the services when they make force disposition decisions; they are inevitably long-term decisions and they do not come about very often but we do have some opportunities coming up in the future where Defence will decide where ships and submarines will be based, for example, into the future. That is not an area where the New South Wales Government is in a position to direct or control but New South Wales is absolutely in a position to make defence and defence presence clearly welcome. There are a number of ways in which we do that.

I think what has changed fundamentally in the past couple of years are two things, one being the long-term investments that are being projected by the Commonwealth Government and which are being followed through in successive budgets that is changing the view to a very long-term one, and the other one has probably occurred over the past decade, that is, the shift in the competitive nature of many of the States. For a State such as New South Wales, whilst we have a share of defence expenditure which roughly equates to population and defence presence, for New South Wales that defence expenditure is not a deal-breaking amount in the economy, which is a very strong and very diverse economy. For some other States the defence contribution is really a very fundamental part of the economic livelihood and structure of their States.

The Hon. JOHN GRAHAM: To clarify what you are saying, defence expenditure is in line with defence personnel and population but it is lower than our population share and lower than our economic share. Do you accept that?

Mr SCOTT: Yes, I do, but I think my first point is that it follows defence presence.

The Hon. JOHN GRAHAM: Yes, I think that is a really important point.

Mr SCOTT: And if we are not conscious of the defence presence that exists and the defence presence that might exist in the future, then we will face a difficult battle in increasing defence expenditure.

The Hon. JOHN GRAHAM: And we should acknowledge that it is a very large presence in New South Wales as well. I think that is well spelt out in all the documents that have been put before the Committee.

Mr SCOTT: It is large.

The Hon. JOHN GRAHAM: We have a substantial footprint?

Mr SCOTT: We do.

The Hon. JOHN GRAHAM: Is it lower than our share would normally be of most economic activity in the country?

Mr SCOTT: Against our population perhaps.

The Hon. JOHN GRAHAM: Yes. What is our goal in that scenario? It has declined a bit over time says the Government's strategy paper.

Mr SCOTT: Yes.

The Hon. JOHN GRAHAM: What is our goal to shift to in terms of a New South Wales' share?

Mr SCOTT: Defence NSW has not set targets for that. In fact, the strategy itself is very strong on in-principle ambition but it is not strong on targets. There are no set targets in there. We have now commissioned a consultant to provide us with some resource to establish strategic level key performance indicators [KPI] and they are around those measures of: What is the proportionate defence presence; what is the proportionate defence expenditure; what is the total defence expenditure; how does it break down across acquisition sustainment and operations because I am conscious that we took a snapshot at the time we created the strategy but we do not actually have a consistent look back to understand what the trends really are and without having a method by which we can routinely assess where we are it is also very difficult to set reasonable targets. I am conscious that at the moment there are no targets set. I think it would be to everyone's advantage if we did set challenging but realistic long-term strategic targets across some of those measures.

The Hon. MICK VEITCH: What is your definition of "long-term"? Is it 10 years or 50 years?

Mr SCOTT: I am thinking in the decades. I am thinking 10, 20 or 30 years. Things just do not shift any quicker than that but also if we are not looking that far ahead, then we are not thinking about the things that will shape defence decisions on where they base their forces, and that is the fundamental pre-determinant—not the only one by any means but the fundamental pre-determinant of the majority of the expenditure that comes into New South Wales, which is really around the sustainment and the operations.

The Hon. JOHN GRAHAM: My guess is that that approach would be welcomed by the Committee. You have given a good snapshot but I think that is fundamental to progress from here. How much has the State share declined over recent years? Are you able to say that or is it difficult to tell?

Mr SCOTT: I do not know that. One fact is that it is Commonwealth expenditure, but the Commonwealth is not particularly interested in State share of expenditure so it can be difficult to extract State-based proportionate figures around acquisition, sustainment and so on. What I have got these consultants doing is working out the method by which we might routinely do that so that we can answer that question. I do not have a table which shows me expenditure back one, two, three or more years. I do not have that answer at the moment.

The Hon. JOHN GRAHAM: One of the points made to the Committee as it has travelled around is that in some ways we really want to move to a position where defence establishments are in the places that make sense; we want to move away from a position where the States are pushing and shoving to have these decisions made on other grounds, whatever those other grounds might be, and it would certainly be in New South Wales' interest if we can get to that point. It may require New South Wales stepping into this space, given how competitive the other States have become, to really force a more rational discussion about where these things are up to. That view has been put to the Committee. I am interested in your view on that discussion.

Mr SCOTT: I think at a level we are stepping into the space. I think the establishment of Defence NSW has been a great precursor. I think Mr Challen mentioned in his opening statement that as recently as a couple of weeks ago Air Marshall Harvey and I were at effectively a roundtable at Parliament House hosted by the Minister for Defence, Marise Payne, with all of the States, defence advocates and functionaries present. That was very much about the Minister for Defence making it clear that her interest was in capability being provided to the Defence Force from where it might best be provided and ensuring that the Defence Force is supported from where it is based. Without going into detail, it was a very collegiate meeting. We are now in a position to

be at that table, whereas in years past we have not. That is certainly a good start at a level. There are other forums through which we are now engaging in that discussion.

The Hon. JOHN GRAHAM: Do you accept the view that has been put to the Committee that the share for SMEs is getting smaller? Is that still a challenge?

Mr SCOTT: I might have a view but I do not have any facts to base that on. What is encouraging for SMEs is the overall environment in which they might now operate. We seek to work very closely with organisations such as the CDIC because we understand the fundamental Federal lead in all of this. Frankly, the Commonwealth Government is doing a good job in providing strategic policy framework in which the defence industry and, importantly, SMEs can operate. I think the environment is changing for the better. We are still very conscious that the industry base is unbalanced between some very strong primes, many of which have been in Australia for a very long time and are fundamentally Australian companies, but then literally thousands of SMEs and not a strong cohort of medium-sized defence industry in between. So there is a bit of a gap there.

The Hon. JOHN GRAHAM: You pointed to a couple of things that might be coming up—ship and submarine contracts. Could you give the Committee a quick description about the pipeline of projects for which there is potential for the New South Wales Parliament and the New South Wales team to get behind and focus on? In other words, what is the pipeline of projects for which it would be useful for there to be some level of political support coming down the line?

Mr SCOTT: I might just pick one from each of the major domains. The Joint Strike Fighter [JSF] program is a very large multinational program. The first of the aircraft will arrive in Williamstown this year. There is an opportunity to create at Williamstown a regional sustainment hub for joint strike fighters—a principal sustainment hub not only for Australian Joint Strike Fighter aircraft but also for aircraft of allies and partners from around the region. That is potentially tens of billions of dollars of work over four to five decades. In the land space, topically we have just had a decision on LAND 440 combat vehicles for the Army. Whilst the construction has gone to another State, it is really important to understand that there are many SMEs in New South Wales that can and will contribute to that project. It is a very good example of the smart pieces of industry coming from New South Wales contributing to the production of a capability for defence. SEA1000 and SEA5000 are a great example in a company like Thales, which already presents almost an end-to-end sovereign sonar capability, to be brought onto Australia's ships and submarines into the future. They are three quite different dynamics but there is opportunity in each of those. People need to know that we are interested, capable and competitive.

Mr CHALLEN: Could I quickly add something on the SME point? It is important that all the States unite in terms of the Team Australia approach. We really need to do more in Australia because we are competing against the rest the world. It is also about building the export capabilities. I think it is fundamental if you are looking at what is in the national opportunity, this is really about an export play. There is a lot of work that we are doing with that. With the SMEs we also need to try and understand the data that is representing those numbers because they could be SMEs doing stuff in the defence space but they are not registered as defence companies, for example. That is also something that we have to be careful about.

The CHAIR: I invite other participants to join the discussion as well.

Mr GOLDSACK: Also reflecting on the SME point, the Federal Government has recently been revitalising the Australian industry component of its tendering. So it needs to be looked at in the context of that. A lot of the new projects that Commodore Scott mentioned are actually starting to fill that framework at the moment.

Professor WILLIAMS: I make the point that the 25 per cent of expenditure is roughly in line with the 25 per cent of the defence footprint. A lot of that work is actually sustainment work—that is, the 10-year play, 20-year play—which New South Wales has almost had by default. We have had assets here so you get that work. Where the other States have been quite aggressive—which means that we are losing work as a State—is where there are builds. That is where the States have worked hard to get hubs—for example, Queensland with the armoured vehicle hub, and South Australia and Western Australia with their maritime hubs. Companies wanting to be involved in sustainment are where the assets are, and that is our current workload. For future workloads, there is a lot of aggressive competition from other States because they have built hubs and they are building assets in those hubs. For small companies like ours we need to be where the build is and that is not New South Wales for SEA1000, SEA5000 or LAND 400. Where we do see an opportunity is the new airport out west, creating a hub there. With aerospace we can actually leverage strengths.

The Hon. MICK VEITCH: What are the important elements that need to be included in the development of a hub? What sort of infrastructure is required?

Professor WILLIAMS: My colleague Stewart Noel and I were actually discussing that this morning. I will defer to him. He has much more hands-on experience.

Mr NOEL: Let me give the Committee some hands-on experience. We have the sustainment of the RTM322 engine and the MTR390 engine. We look after the engines for the 9H90 and the Tiger helicopters. What we have managed to do at Bankstown—we have 100 employees. We are very small company but we are doing quite a bit of external or export work. We are looking after the fleet for the UK MoD Apaches and Merlins. We are looking after the Danish EH101s and the Portuguese EH101s. We are doing that from Bankstown. We have a skill set of employees who are world-class in terms of that engine. What we targeted to do was to become the experts. We wanted to become the world experts on the RTM322, and that is what we have done. We would invite the Committee to come out and have a look. We believe we have a world-class facility in the Bankstown hub.

As Mr Williams mentioned, with Badgerys Creek opening up, it is actually probably more attractive to build that type of hub out there than at Bankstown. Bankstown is a good foothold for us right now but moving forward you have got the space and the ability to start fresh. We are very limited in what we can do now at Bankstown Airport. If you look at Badgerys Creek and take on experiences from other countries—as the Committee members can tell I am Canadian so I can speak to a little bit around that. What they tried to do in Montreal with Mirabel is probably a good example of what not to do when they first started. Now Mirabel is turning around to become a very active industrial footprint for the aerospace industry but it took a lot of government initiatives.

Mr CHALLEN: I might be able to add a perspective, and then we can pass the question back. My branch is leading the development of the Western Sydney Aerospace and Defence Industry Precinct. I will touch briefly on the key ingredients that we need for that precinct to be successful. The key attribute of a greenfield site is that it offers a lot of opportunity, but it offers a lot of challenge. There is evidence that a lot of greenfield sites fail if you do not get the value proposition right. In that Aerospace and Defence Industry Precinct we are focusing on getting the value proposition right for industry. That is around universities, research and development, getting in the anchor tenants—the big prime contractors such as Northrop Grumman—and building the SME supply chain around it. It is about looking at a variety of skill sets, so we have to bring in universities and TAFE. The key ingredient is to drive collaboration between industry, universities and government.

Collaboration without purpose is useless, so we have to drive commercial outcomes. There is already serious interest in that precinct from universities that want to establish themselves there. As part of the City Deal we are looking at developing an aerospace institute within that precinct. We have anchor tenants like Northrop Grumman, which will establish a \$50 million centre of excellence in that facility. We are talking with all other key prime contractors at the moment, and we have set up a Western Sydney Investment Attraction Office, which will be focused on driving in investment and attracting businesses into that precinct. If you get those ingredients right, that is the fundamental part of it.

The Hon. PAUL GREEN: We have travelled a bit regionally. We do not want it so Sydney-centred that all the deep servicing is happening in that wonderful hub out at Badgerys Creek, because regional jobs are so important. Do you have a comment on that?

Mr CHALLEN: I do. We have made very clear how we are going to attract businesses and investments to the precinct. It has to complement the other existing facilities—not only around New South Wales but around the whole of Australia. We are very mindful that obviously some overlap may occur but we do not want to pick up and move industries from one area into that precinct. So we have to be very mindful and very focused on the fact that we want to attract new businesses into the precinct. We may also look to attract businesses that might have outgrown where they are now. The reality is that they will have to leave that facility if they have big expansion plans. We have made a conscious effort to make sure that it complements the other places—Melbourne, Brisbane, Canberra and the other regional bases around New South Wales. It has been top of our minds not to cannibalise, but really complement the existing facilities.

The Hon. MICK VEITCH: I would like to hear what happened in Canada that we do not want to replicate in Australia.

Mr NOEL: They focused solely on passenger traffic and did not bring in any industrial footprint, so it failed miserably. The passenger traffic was too far away from Montreal, so it was logistically difficult. They had this massive white elephant built 40 minutes outside of Montreal. They are only now bringing in the industrial footprint, and it is really coming back to growth—but that is 30 years after the fact. They stuffed it up right at the beginning by not having, as Duncan Challen said, that strategy of having the industrial footprint there, as well.

The Hon. PAUL GREEN: My take on what Ms Anna Murray was saying was that she was quite scathing about collaboration—that it was missing. Do you have some comments on her opening statement?

Mr CHALLEN: Sorry, whose opening statement? Your statement?

Ms MURRAY: Yes. It was not directed at you. It was a general statement about—

Mr CHALLEN: That is all right. It goes across the sector. Historically there has been a bit of a disconnect between how universities and industries collaborate. Universities are now moving forward on that; they are bringing in people from industry and trying to connect themselves to industries so that they are working on programs that matter to industries, and that have a commercial outcome.

We have established the Defence Innovation Network, which is to address that as well. In the past—again, this is my own opinion—there has been a lot of wonderful research happening but whether that has been able to be commercialised has always been the question. Part of what Peter Scott is doing, through Defence NSW, is to be the bridge to connect universities with industry and government. For a long time this may have been happening without the focus that is required, but since we have established Defence NSW within the Department of Industry, we have been focusing on that.

The Government has launched the Boosting Business Innovation Program, through a grant that we have given to 11 universities and CSIRO. That, again, is to help universities to bring in SMEs to share facilities and to get access to expertise. They have created incubators and hubs. So we are very focused on bridging the gap between universities and industry. It is fundamental for success in Australia, but it has to be driven by a commercial outcome. I think that is the bit that might have been missing in the past.

The Hon. MICK VEITCH: Is CSIRO the Commonwealth Scientific and Industrial Research Organisation?

Mr CHALLEN: Yes.

The Hon. PAUL GREEN: Ms Murray, in your submission you talk about a framework. In your opening statement you said that New South Wales is probably missing some opportunities that are happening in other States. Can you elaborate on what we are not doing that other States are doing?

Ms MURRAY: Yes, I can. I have spent a long time working in the executive and working in a small company in defence, working with primes and talking to a lot of other small companies based in New South Wales. Our membership goes up and down in direct correlation to defence business. As Chris alluded to, we have a large membership now, which suggests that a lot of smaller businesses are seeing growth, again, in defence industry. Historically, New South Wales has been underfunded in the defence area, and has had less oversight and governance from the New South Wales Government than other States. We suffer from that, because most of the people who work in defence industry organisations are volunteers. That is not the case in other States. People who are not in volunteer positions are able to spend a lot more time and energy in furthering SME defence interests than groups of volunteers, however keen and enthusiastic we are.

An interesting point that I wanted to make with respect to the previous discussion is that there is an enormous amount of innovation going on in New South Wales, as I am sure Mr Challen, Mr Scott and the rest of you know. A lot of the smaller start-up innovative companies are far more successful selling to international defence organisations than they are selling to our own defence organisation. So we see them step out of the defence arena here because they find it almost impossible to work within the governance and sell into the Australian Defence Force.

The Hon. PAUL GREEN: That is another point I wanted to bring up. We have heard the Federal Government talk about exporting opportunities in defence. Do you have any comment to make about what New South Wales is doing on the back of that announcement by the Federal Government with respect to exports? What steps are we making to benefit from that?

Mr SCOTT: The principal way in which we support companies with expert potential is through trade shows. There are some major domestic trade shows—PACIFIC 2017, Land Forces and Avalon Air Show. Defence NSW has a very strong presence with the principal sponsor for PACIFIC 2017. We selected a dozen or more small- to medium-sized enterprises to co-exhibit with us. The opportunity for us to be there alongside those companies was very good for them.

We do similar work overseas. There is less capacity for that but we very deliberately link in with Team Defence Australia, which is a Commonwealth sponsorship of Australian companies exhibiting overseas and looking at breaking into export markets. So a presence at those shows is one element, but there are also preparations—helping the companies to prepare to effectively exhibit—and then working with the companies

when they come home to help them capitalise on some of the opportunities. It is a long-term thing, even though it looks like a short-term event. That is probably the major thread.

We also look to work in concert with CDIC. We have events coming up in the next couple of weeks where we are looking to introduce companies to the defence environment—tell them what is involved in working in the defence environment and winning defence contracts. We work with CDIC when they explain the defence export strategy to companies. For us it is about making the connections and bringing the companies together so that we can explain to them where the opportunities are, and how to reap those.

Mr CHALLEN: Just to add, the other thing we are also doing is working through our TradeStart network with Austrade. We have got representatives of the regions that work with businesses, and part of that is to help them get export ready and, in particular, letting them know when they are not export ready, because that is also the challenge that is sometimes a costly and time-consuming process. If you are not ready do not start to think about exporting. We have also added a category to our Premier's NSW Export Awards that is on defence. That is, again, promoting the opportunities across the sector on that. Then also I think the third one is about building the capabilities of SMEs in particular to understand what the big prime process is to get into those global supply chains, because that also can be quite convoluted and quite complex. It is making sure that the two can speak the same language. I think the recently released export catalogue, about 30 per cent of New South Wales businesses were contributing to it. So I think there is a strong base but there is more that we have to do to support them and we will continue to do so.

Professor WILLIAMS: We are doing a lot of very good work with the commodore and the team from the bottom up getting people export ready. Another pathway is that a number of overseas companies want to come to Australia to support the new build programs and it is purely a case of funding. We are working with some French companies at the moment, and they are in St Étienne, and they have been aggressively targeted by the Victorian Government and the South Australian Government, who have people on the ground in Europe calling up companies in the supply chain of SEA1000, SEA5000, saying "Look, if this company wins you need to come to our State and we will help you set up or help you get through the regulatory hurdles. St Étienne will put you in touch with universities". So as a State we are starting to get together in terms of looking outward and there are also companies wanting to come to Australia where there is not a lot of beckoning or calling or nurturing in terms of getting them to come to Australia, and to New South Wales in particular.

Mr GOLDSACK: I think one of the ways to help that is the theme that we have already explored over collaboration. I think that is a very important theme because ultimately I believe that Australia has to work together to increase the size of the pie. I think that is a really important piece.

The Hon. PAUL GREEN: I think the whole point of the export market is to try and get that partnership.

Mr GOLDSACK: Yes, and that is to team Defence Australia and the Defence Export Office and those types of things.

The Hon. PAUL GREEN: In your submission you talk about the framework. How many members have you got in your organisation?

Ms MURRAY: I think we have about 120 at the moment.

The Hon. PAUL GREEN: What concerns me is that we have got the New South Wales initiative under Commodore Scott and the department and there does not seem to be an embracing of this framework that you have put before us. It concerns me that that conversation does not seem to be collaborative or it is not happening.

Ms MURRAY: I think it is. I think it very much is happening, but from what we see here with Defence NSW it is not resourced in anything like the fashion that Defence SA is resourced or that the team within the Victorian Government is resourced.

The Hon. PAUL GREEN: Once again, can you help us understand how is that resourced differently to what we are resourcing our current—

Ms MURRAY: I think there are a lot more people. Defence, they say, has a lot more people. Commodore Scott and Mr Challen are doing some great things, as they have discussed. I do not know how many resources they have at hand, but the companies that we talk to in South Australia, for example, have a whole government department effectively—a small department that looks after their interests and promotes them and works with them with the overseas companies.

The Hon. PAUL GREEN: That brings me back to Mr Challen and Commodore Scott. How many staff have you got working with you?

Mr SCOTT: Myself and four permanent staff and, of course, the Defence Advocate is contracted to the department as well.

The Hon. PAUL GREEN: Is that enough?

Mr SCOTT: I am doing my very best with what I have and I think we are achieving some good success.

The Hon. PAUL GREEN: Let me put it differently. Could we do more if we had more resources?

Mr SCOTT: Without a doubt.

The Hon. PAUL GREEN: Is there an opportunity to do more?

Mr SCOTT: Without a doubt.

The Hon. NATASHA MACLAREN-JONES: Is it possible to get a comparison with Victoria and South Australia as to the size—

Mr SCOTT: Defence SA has in the order of 20 staff. It also has a strong board of advisers who advocate, chaired by Sir Angus Houston.

Mr CHALLEN: It is also worth considering that when we look at Defence NSW, the unit itself, there are other parts of the Department of Industry that are supporting the sector. We have got Training Services NSW, which is looking at the skills challenge that we have got; we have got a sector based team in Western Sydney and that links into the Office of Regional Development—so we have got people in the regions that are doing activities around defence and defence industries; we are setting up Western Sydney Investment Attraction Office in Liverpool to lead the development of the precinct. So I think we have to be careful that when we look at the size of the resources that are available we do have other resources that we are applying to the defence sector—it is just not branded "Defence NSW". Collectively, there are a lot of people that are working with advanced manufacturers that are not sitting in Peter's team; there are a lot of people working with cybersecurity industries that are not sitting in Peter's team; also Medtech and so on. I think we need to be careful—of course, with more resources you can do more, but we need to be smarter in how we use our resources.

The Hon. JOHN GRAHAM: Would you be happy to take on notice to give the Committee some information about that? I think that is certainly relevant to the Committee's consideration, but on the face of it I think you will find the direct South Australia-New South Wales comparison is pretty persuasive. If there is other departmental information you would like to provide to say, "Here's a snapshot"—for example, "At the moment this is the team we have got working on these issues"—I think we would certainly take that into account.

Mr CHALLEN: That will be good for us to provide. I am happy to take that on notice.

Mr SCOTT: Just to follow on from Mr Challen's comment there, that really is a part of our job. Our tagline is "strong, smart and connected", and what I explain to my team each day is it is our job to be well connected to what is a very strong and capable government and know where the resources are that we can bring to bear to support the defence industry. So we are building our expertise in that day by day and strengthening our connections into other parts of the Government so that we can bring that resource to bear as it applies.

The Hon. JOHN GRAHAM: Could I just ask you about the board of directors, since you have raised it? One of the suggestions about one way to strengthen the New South Wales operation is to have either some ministerial oversight or a board of directors. That would be one way to strengthen the governance and the impact here. Is that an opportunity in New South Wales, first—but any other view is welcome?

Mr SCOTT: It might be an opportunity. Again, there is opportunity to strengthen the defence position. I think the value would depend on the construct, and I think that it would be worth asking questions about the relative value of additional oversight compared to potentially additional functionality. That would be my broad comment. But I think it is certainly something that is worth considering by the Committee and worth considering by relevant Ministers.

The Hon. MICK VEITCH: Does anyone else have a view about the governance model?

Ms MURRAY: I know that the president, Mr Medhat Wassef, was very keen on such a government oversight, ministerial oversight.

Professor WILLIAMS: I think it has probably got two roles: one is that it increases the visibility of the industry and what the team in Defence NSW is trying to achieve across the broader parliamentary landscape. The other piece is advocacy—that is incredibly important—being visible. Having been in and around the Canberra service for the last 10 years, New South Wales was non-existent until the sort of work that the Defence Advocate has done in terms of just knocking on the door of the chief of the Defence Force saying, "We're here, we're available, we're interested." Having that board—I know why Medhat was interested in having retired defence people preside, even senior public servants; it means that those linkages and those discussions give you that communication channel back into Canberra where a number of these high-level discussions and decisions are made.

I will give you an example, tying together some of the things that the commodore was saying about the time frames. It takes a long time for the Government to decide to reposition assets. A number of years ago we had a submarine base at HMAS *Platypus*. The whole of the Royal Australian Navy submarine capability was here. It moved to Western Australia taking all those jobs, all that work, and all that maintenance without so much as a whimper from New South Wales. That would never happen in South Australia, Victoria or the other States. The lesson learnt is that by being aware of things, by being part of the strategic discussion and by having those people at the board level means we are at least part of the discussions and we do not wake up one day and there is an announcement that this whole asset is being moved. Why? By the time that decision is made there has been 10 years of advocacy and discussions in Canberra about where things should be. We need to be part of those discussions. That is part of what we are trying to say.

The Hon. PAUL GREEN: That is why we are having this inquiry.

Mr CHALLEN: Obviously, the Government has a very important role to play in terms of advocacy in the State, across the country and also internationally. However, we must also recognise that the Premier, the Deputy Premier, Minister Blair and Minister Ayres have been great advocates for the defence sector. Whenever they can they have been promoting the strength of our capabilities in New South Wales. We also should consider how to use the Parliamentary Friends of Defence. If we are going to create another layer on top of that, we need to think about what outcome we want to drive. We have mechanisms in place that are starting to work better than they might have for a while. That is the point to note. Perhaps we should leverage what we already have and keep driving and getting the Premier, the Deputy Premier, Minister Blair and Minister Ayres to keep doing what they are doing.

The Hon. MICK VEITCH: Do you think we should allow time to establish some stability around the governance models?

Mr CHALLEN: Yes, and also have a look at how we can better leverage the Parliamentary Friends of Defence. That is a powerful mechanism. In my time in my role I have not seen that used as much as it could be.

The Hon. PAUL GREEN: One of the submissions talks about the United States and Congress fighting for a fair piece of the pie. That is what this inquiry is doing: We are starting to get our act together and saying that we need to fight for New South Wales. In light of that, we know that the submarines went to Western Australia, but my understanding from the evidence is that now more than ever we need an eastern seaboard submarine base. One of the submission talks about the base being in Newcastle. Can anyone enlighten the Committee? Are we any closer to getting a submarine base on the eastern seaboard or in New South Wales?

Mr SCOTT: My understanding through engagement with the Navy is that it is continuing to build its service level view of where a number of classes of ship and submarine need to be based over the next several decades. Once it has fully formed that plan and it has been cleared by the Minister for Defence, that position will become public. We have sought to make it clear to Defence that we are willing as a department to engage with it and to support it in those deliberations, and to support it in any preliminary work it might need to do in assessing ports, viability and so on. Defence has not yet come back to us to take up that offer, but it is clearly on the table.

The Hon. PAUL GREEN: That is what Mr Williams is saying. We really need to be out there calling in this stuff, not waiting for someone to knock on the door. This has been the problem with the defence industry in New South Wales. As I said, it has been a good move by Minister Blair to take the initiative on this. However, as I said, we should not wait for a knock on the door. There is an acknowledgement that we need a submarine base on the eastern seaboard.

Mr SCOTT: Yes.

The Hon. MICK VEITCH: I refer again to SMEs. Has a gap analysis been done about where we are lacking with SMEs to support not only the current defence industry requirement but also the projections? Has any work been done on how we need to strengthen our SMEs?

Professor WILLIAMS: The Centre for Defence Industry Capability [CDIC] has done a significant amount of work. A lot of capability mapping has been done by industry associations like the Australian Defence Industry Network [ADIN]. The market has a number of primes who are asset managers. They manage a ship or a type of tank, or what have you. Then there are thousands of little companies around Australia that do one thing. They might do a brake manifold on an armed vehicle. What we do not have in Australia is the middle-tier companies that are system integrators. They bring three or four parts together and integrate them into a drive train for a tank. We do not have that middle tier and that is the part the CDIC is trying establish through its programs at a Federal level. It is federally recognised.

How do we get those little companies together to get to the system integration level? That is probably the key part of the marketplace. For example, with our exchange into the primes for the LAND 400, and as the managing director of H. I. Fraser, when the French, German and United States companies come to Australia they look around and ask where our drive frame system integrator is. We do not have one. Why not? They want our hydraulic system integrator to help design the elements of the submarine hydraulic system. We do not have one. We have a parts supplier, but we do not have that middle tier. There is a lot of science, technology, engineering and mathematics [STEM] and capability improvement involved in that middle tier. None of the programs that CDIC is trying to roll out are helping companies to move from bits to being system integrators.

The Hon. MICK VEITCH: I would love to hear about that. Where are we up to and how are we making it happen?

Mr GOLDSACK: I am not directly involved in that area. If the Committee wants more information, I will take the question on notice.

The Hon. MICK VEITCH: Please do so.

Mr GOLDSACK: I know that CDIC is doing a lot of work at the moment. The information about SME capabilities has been largely held in isolation. The CDIC currently has a project underway to consolidate that information. There is also about to be an announcement about the strategic industry capabilities framework, which is the Defence view of what is needed in Australian industry and what is important from a strategic perspective. Work is being done in that area.

Mr SCOTT: I think that the industry capability framework will be very important for shaping our efforts in the future. It will tell us the sovereign industry capabilities that Defence believes it needs. That will help everyone involved in the defence industry to sharpen up on where they focus. I think there will be many of those sovereign capabilities where we can see capabilities already resident, even if they are dispersed geographically or organisationally in New South Wales. When we have some clarity on that, it will help us to draw those capabilities together. I think that is going to be a very important policy.

Ms NORDHOFF: We are actively looking for partners overseas that would like to establish a manufacturing facility in Australia using an Australian SME or a medium or prime so that local companies can go that integrated capability domestically. We are in the process of actively finding those partners overseas to bring that investment to Australian industry, and specifically to New South Wales.

The Hon. PAUL GREEN: To New South Wales or Australia generally?

Ms NORDHOFF: We have a national approach. However, in my specific role I focus on New South Wales. I am in the process of providing that support to some companies, particularly in regional areas.

The Hon. PAUL GREEN: How is that looking?

Ms NORDHOFF: It is going quite well. That happened after a referral we received from our New South Wales colleagues following a regional visit to the Illawarra. It is going quite well.

The Hon. MICK VEITCH: From an SME perspective, how can that relationship be strengthened so that you are part of the discussion in a timely fashion and so that we discover the bit missing and do not miss out?

Ms MURRAY: We work closely with Mr Goldsack, Ms Nordhoff and CDIC. Likewise, we work closely with Defence NSW. We produce capability statements for maritime aerospace and land for our members and we showcase them at events like the Pacific International Maritime Exposition and other trade shows we attend. We have no data on how successful they are, but we do hand out a lot of capability statements.

I think to have somebody like Defence NSW approach to work with the Centre for Defence Industry Capability and take the capability statements of our small to medium enterprise members and then perhaps put them forward and add that system integrator layer would be very beneficial, because that is missing. That is what we hear from the primes all the time. They do not want to talk to somebody who is making part of a drive

train or part of a hydraulic or part of an engine, they want to talk to somebody who can manage the whole group of smaller businesses.

The Hon. MICK VEITCH: Historically, why do we have that gap around systems integration, why has that occurred?

Professor WILLIAMS: Over the last 10 or 20 years what we have done is we have purchased military assets off the shelf. We bought the Navantia air warfare destroyer and we built it in Australia, we bought the M1A1 Abrams tank, we bought the C-17 Globemaster. So, as an Australian company, if you want to get into those build programs you have to be where the engineering decision-maker is. When the air warfare destroyer came to Australia to be built the design was already decided, the parts were already decided by the design work that had been conducted in Spain. As an Australian company to break in, we had to break in to the Spanish supply chain in Spain to get a part to be on a ship that is built in Australia.

You cannot wait in Australia for the air warfare destroyer to come along and say, "We make valves": "No, that's alright, we already have our valves decided by the engineering design activity in Spain." So what you end up with is ships, aircraft, tanks that are designed overseas, built using key components imported from overseas and when it comes to sustainment, which is the 25 per cent of the activity we see in New South Wales, that is mostly sustaining someone else's part from an overseas company on a big asset. The Australian content was not a driver. Does that make sense?

The Hon. MICK VEITCH: It does. What would be the reluctance now for someone to move into that system integrator role?

Professor WILLIAMS: With the export drive from the Federal Government and the increasing level of Australian issue capabilities being mandated the primes that come to Australia now are realising that it is critical to engage with SMEs. There is now a driver. With the LAND 400 program, for example, the original bids were sent back out again because the level of Australian content was not high enough. All of a sudden we saw a case where Rheinmetall and Patria were aggressively and actively targeting Australian companies to find out what can be done here. It was a different discussion. The navy are going through it at the moment with SEA1000 and SEA5000 for the frigates; BAE Systems, Fincantieri and Navantia have all been holding roadshows. There is an increasing interest from the primes to engage with small businesses to try and find out what they can do in Australia now. It is changing, which is the future. What the past has been is that the industry we have got is from the past, which has been designed overseas, procured overseas and assembled in Australia.

Mr CHALLEN: Through LAND 400 we learnt so much about our supply chain that we did not know before because of the roadshows, and they brought in people to talk about what you actually do. I think what is important then for us, and I think CDIC is doing this, is: How do we take that information and use it? From a New South Wales Department of Industry we are starting to map industries or companies that do manufacturing work and we want to, in time, have a geospatial representation of where they are and what their capabilities are. That is something that we should focus on. It is understanding who is out there and what are their capabilities and then how we use that information so that international primes can easily access it.

For example, Boeing did a tour around Australia and it was looking for innovative SMEs and start-ups that can plug into the supply chain. It took us a bit of time to actually work out who are the ones we could plug in but, if we could have that readily available, that is powerful. Then it is easy for international primes to look and source companies that might have the capabilities in the future. From my learning from the Boeing experience it needs companies to help it with its future projects. It needs to be at the beginning now because it has to get through all the accreditations. It needs to be future orientated. There are some cutting edge technologies that people are using on different applications and prototyping that have relevance to Boeing in the future, as an example. That is something we need to focus on.

Professor WILLIAMS: That becomes critical in terms of the actual industry policies. By attracting someone like a Boeing to New South Wales—it was at Bankstown and it moved—what happens is that all these innovative little companies that might be all around Australia say, "We want to be part of the Boeing supply chain. We have to be close to Boeing so you can have a coffee with the chief engineer," and you are in the ecosystem. If Boeing decided to set up somewhere else, say in Perth, then all of a sudden companies say, "We have to be close to that. Four and half hours by plane is too far away. We have to be close." You find a drain of companies to where those big companies are. To Mr Noel's point about the importance of setting up the Western Sydney aerospace hub and getting it right, having Northrop Grumman there is the critical first starting point. Anyone who wants to be close or part of the Northrop ecosystem into the future has to be there; you do not have a choice.

The Hon. NATASHA MACLAREN-JONES: Regarding the recent announcement in relation to the naval ship building college, although it is based in Adelaide, there is a lot of talk that it is beneficial for all states. What opportunities are there for New South Wales, if any?

Mr SCOTT: One area where I know work is happening is the Australian Maritime College, which is based in Launceston in Tasmania. It has recently established a presence here in Sydney down at the Australian National Maritime Museum. We have been involved with them and looking to help them set up there such that they can effectively export some of their courses from Tasmania to Sydney, where they see a market, both domestic and international. They are recognising that taking people to Tasmania to train them in those maritime or naval shipbuilding skills to then move away is not the model that they want to follow in the future. That is one example where I know we are moving forward in that regard. I think there is undiscovered potential around that national shipbuilding college concept. To date it perhaps does not appear as national an approach as it might be. There is certainly some opportunity there.

The Hon. NATASHA MACLAREN-JONES: Does anyone else have a comment on that? One of the things being talking about is that it will address a skills shortage. What is your view in relation to science, technology, engineering and mathematics subjects? Is enough being done to encourage students to take that on? Do we need to be more aggressive in having subjects encouraged within the education curriculum?

Mr CHALLEN: There has been a lot of press about that, and the Minister for Education came out and said, "Let us not focus too much on STEM." It is hard for us to comment on what is the right balance. It is better for the businesses to talk about that, but when you talk to any international business or businesses they will establish themselves where the skills are. That is the number one priority. If you do not have the skills it does not matter what else you offer and you throw at them. It really is fundamental around the skills. We need to make sure that we are looking to the future in terms of the skill sets that we need. There will be a challenge in Australia with all the activity that is happening around builds and whether or not we have enough skilled workforce to meet all those requirements.

We do not want people shifting States to find where the work is. We need to collectively look at how to address this as a nation. What could be a key issue for us is that we do not have the right skills for the work that needs to be done around defence industries. We are focused on driving, in terms of Defence NSW and the Department of Industry, STEM and we are doing a lot in that regard. We are working closely with the TAFE department to make sure we have the right curriculum in place and working with universities to make sure that we are getting graduates out there that can find the right types of job that are both highly paid and highly skilled.

The Hon. NATASHA MACLAREN-JONES: Is it a national issue? Is New South Wales on par with other jurisdictions or behind?

Mr CHALLEN: I cannot comment in terms of the deficit, but I think we all have to work together on this in terms of how we address this in terms of a national issue that may or may not be there. I do not have the details as such but I think that all the States need to come together and really start to look at what the skills are that we need in the future and where the gaps are, because we are not competing against ourselves, we are competing against international markets around how we actually address all these needs. If we are falling short of an international market then we do have an issue because we start to lose our relevance.

Professor WILLIAMS: It is well recognised at the national level so CDIC has been engaged with the Department of Defence. There has been a very, very serious media campaign around the industry behind defence to try to lift the profile and the visibility of defence. One of the key things that has been found is that in New South Wales, for example, university graduates in engineering are much more likely to go into finance than into defence because they just do not see any jobs in defence. There is no visibility of jobs in defence. Yet if you are an engineering student you use maths and so there is that transition. We are creating the rights sort of graduates. There has got to be meaningful work at the end of the degree. So that visibility of: Is there work in New South Wales for engineering graduates in the defence marketplace?

If you ask at Macquarie, UTS or the University of Sydney at the moment there are starting to be groundswell of "Oh, there are jobs." These universities, through the Defence Innovation Network, are starting to set up parts of their universities, particularly targeting defence work which means in postgraduate and what have you. The ecosystem is not simple where you just say, "Throw money at it; it's better." It takes time to build it because it has taken time for it to fall off.

The CHAIR: I refer to system integrators. Do we have small manufacturers in New South Wales, in particular, that are targeting perhaps overseas system integrators?

Professor WILLIAMS: Absolutely.

The CHAIR: Is that a growing industry? Is New South Wales making the best products in the world and they are fitting into, say, the drive train that is assembled overseas?

Professor WILLIAMS: New South Wales has a lot of hidden gems. I guess because traditionally, apart from Fleet Base East and maybe Illawarra and the Hunter, it is very hard in some of the activities we have done from SADIG. So we have a similar sort of about 200 members. The mapping activity we have done has shown there actually is not a designated hub of engineering or maritime or aerospace. The companies are everywhere, whereas if you look at something like Macquarie University all the Medtech companies are focused in that space. It is not easy to say in New South Wales: "We have this hub, here are these companies and associated industries—and here they all are." It is a lot harder to try to dig out those gems, but those gems are absolutely there. On the northern beaches Incat Crowther is designing ships that are being manufactured all around the world and you would not know it was there. It is a little company with amazing capability; another one of those hidden gems.

Ms MURRAY: There is a start-up company on Cockatoo Island making carbon fibre long-range drones and you would not know it was there either.

The CHAIR: Recently Minister Christopher Pyne launched a marketing program to market Australian products internationally. Similarly, is there any kind of marketing initiative for New South Wales defence manufacturing to show what we can do not just around Australia but around the world? As you say, there are hidden gems but how do we communicate them?

Professor WILLIAMS: To be honest that would be going back to the old feudal colonial days where Victoria, South Australia and everyone goes their own way; it is much better to try to be collaborative and be part of the Federal Government effort. There is a lot of capacity and a lot of resources there. There are Austrade and Defence attachés who have been briefed up now. There is an added defence export catalogue. So that work is underway and in some ways it is trying to work out what is the best bang for the buck in our activities, whereas some of that has already been done to a certain extent.

The Hon. MICK VEITCH: This is this Committee's last public hearing. We have travelled the State and held public hearings, developed a discussion paper—which I hope you have all had a chance to read—and we are now getting to the nitty-gritty of pulling together a report. Is there one thing you would like this Committee to recommend to the Government that would take our defence industries, whether through SMEs or whatever, into the next 20 years?

Professor WILLIAMS: Fierce advocacy for structuring, involving what makes sense to New South Wales assets, but really having serious, ongoing discussions about what the right amount of assets for New South Wales is in terms of submarines, Joint Strike Force. What makes sense but also making sure we do not let things drop off the back of cart because we have gone back to sleep in two years' time. It is not a two-year play; it is a 10-year play or a 20-year play. That base load of 25 per cent that is there on sustainment and assets. That build numbers will go up and down year by year but that base load will stay. That is the good, long-term meaningful work which means you can go and get graduates, you can get trainees, but you have got to have meaningful work, and that starts with where the assets are to be sustainable in the long term for the long game.

Mr SCOTT: I mentioned very early on defence presence. I think if the Government openly and vigorously honours and acknowledges the importance of defence presence to this State, and the role that the State plays in supporting defence, I think that is probably the most important thing. It is not necessarily the thing that will have the most immediate impact but I think it is the most important thing.

Ms MURRAY: Alluding back to the framework that we put in our submission, I heard about a lot of initiatives here through Defence NSW, through SADIG, through other avenues and they do not seem to be in a kind of formal structure. Mr Challen alluded to a lot of cybersecurity work, a lot of training and a lot of work we do with universities and it would be really good if it was all in one place or, at least, had linkage into somewhere like Defence NSW so that, especially for small to medium enterprises that have their day job, they can go to one place and find all these things and find this advocacy and resources that they need to be successful.

Ms NORDHOFF: From a CDIC perspective in the context of this hearing, the most important thing for us is the continued support of our New South Wales Government colleagues to implement the national approach that we take but to do that through the continued implementation of the Defence Industry NSW Strategy.

Mr GOLDSACK: One of the themes that has been brought out today is that of collaboration. I talk about collaboration between States, universities, business and government. I think we have drawn that out and I think the real key is to be very collaborative; the world is a big place.

Mr NOEL: You have to have the relationship with the forces in order to get the business. Once you get the build, you get the sustainment and sustainment turns into exports.

Ms O'DWYER: I think understanding capability, what exists already, and really trying to map that a lot better than what it has been done in bits and pieces, because that is what you can sell on to whoever really and you can build on it.

Mr CHALLEN: Mine would be enduring a long-term government support of the sector and it is a bipartisan support because we do not want to give the industry the sugar hit that we have given in terms of the refocus on defence for it to wane in again. We just cannot keep doing that to industry. It will damage our reputation and it will damage how industry perceived government's level of focus on the defence industry so for me it would be enduring long-term governmental support of this sector. And the acknowledgement of the importance that sector plays to the economy of New South Wales as well the importance that Defence NSW plays to the national economy.

The Hon. PAUL GREEN: I refer to page 2 of RDA submission, No. 6. You say that there is an urgent and ongoing need to ensure that this State provides a focus and forum through Defence NSW. That suggests to me that it is or it is not happening, or it is waning or some things are not right. Can you clarify that?

Ms O'DWYER: I think it is the fact that Defence NSW was only established very recently and the need to make sure that its presence is the focal point for New South Wales and that there is a lead agency that is selling on what New South Wales can do for the industry. Basically that was the tone of that. Mr Williams, any more on that?

Professor WILLIAMS: That is exactly the right thing. It is to try to stop this sort of sugar hit where a government comes in and gets excited for a year or so. There is a lot of activity and probably gets a short-term sugar hit. It is a long-term game and if it does not get the sugar hit, it disappears. Small to medium businesses over the last 10 years have been through this rollercoaster ride of, "Yes, we are in, we are out; we are in, we are out". It gets to a point, as per Mr Challen's point, that we have been through this, as industry, a number of times. We have good momentum now with Defence NSW. We have got a good advocate and we are getting good momentum. The last thing we want is for it all to fall over again because there is a loss of interest or they did not get the short-term sugar hit and we lose more assets. It is that ongoing bipartisan, beyond three years, five, 10 years; it is that long-term play. That is why it is urgent to make sure that it does not fall over again.

The CHAIR: Thank you all for attending the roundtable this morning. We appreciate your time. The Committee has resolved that answers to questions taken on notice be returned within 21 days. The secretariat will contact you in relation to the questions you have taken on notice. Thank you again for making yourselves available. We appreciate it.

(The witnesses withdrew)

(Short adjournment)

JOHN HARVEY, NSW Defence Advocate, on former affirmation

MARK GOODSELL, Head, New South Wales, Australian Industry Group, affirmed and examined

LAURIE KOSTER, Chairperson, Shoalhaven Defence Industry Group, on former oath

BOB HAWES, Chief Executive Officer, Hunter Business Chamber, sworn and examined

The CHAIR: Would any of you like to make a short opening statement?

Mr HARVEY: If I could perhaps make a comment on a question this morning about the percentage share between States? That is something I think about a lot and work with. I guess the first point to note is that it is not a zero-sum game here in what we are trying to do. My position always with the other States has been, "Let's not fight over slices of the pie. Let's make the pie bigger for all." I am not particularly concerned about the per cent for New South Wales although automatically I tend to do that as a benchmarking exercise. Mr Challen mentioned there were about 30 per cent Australian companies in the export catalogue. That is not a bad way to say, "Are we represented? Are we fully engaged?" I will tend to look at that sort of thing but the trick is to make sure that we work together. I would not be too worried if the per cent went down a bit but if the total amount went up that is what I would be looking at, I must admit, as we go through. That said, metrics are important and the Commonwealth squad is working on that but I just make the point about the pie bigger for everybody as we go ahead.

Mr GOODSELL: In my 25-odd years of public policy engagement in the State I congratulate the current Government and this Parliament on its efforts in getting a focus on defence through this process. It has not been there in the past and the State has probably suffered because of that. It does then require an ongoing effort to avoid the perception suggested in the previous hearing but we would congratulate the Committee on adopting a process that is as bipartisan as politics allows.

Mr KOSTER: To follow on from what Mr Goodsell was saying, I think it is great that we have been invited to come along and speak to the Committee. This is the second time I have been here. One of the things that the defence industry has seen over the last few years is that the Federal Government—and I am apolitical—has put out a plan so industry can start to work towards that plan. So if New South Wales comes up with a plan, we implement the plan and that is all good for industry. Industry is not interested in handouts; it wants to know that it is going to be backed. Industry wants to know what the ground rules are, where the posts are and that it is going to be backed when the ball is thrown in the air and the whistle is blown.

Mr HAWES: I just reflect those comments but I would also like to pass on apologies from Tony Cade, Chief Executive Officer, HunterNet, Newcastle. He phoned in crook this morning. Tony is the other part of Hunter Defence but I will be wearing the hat today. I look forward to contributing to the discussion around the points that have been circulated.

The Hon. JOHN GRAHAM: Mr Harvey, thank you for your opening comments. I could see you restraining yourself when you were seated in the gallery. You did well not to interject. I am interested in your view on Mr Veitch's earlier question: "If you had to pick, what would be the number one thing that we could do to shift the dial in this space for New South Wales?"

Mr HARVEY: I will start with the big picture again. Taking the overall picture, I think a critical element of the Commonwealth Government's ongoing support for the defence industry in Australia will be when they come out with sovereign industry capabilities. You need at the top level the Commonwealth first and automatically that will flow through because New South Wales is inherently a major part of defence anyway. Again, I think ongoing support from the New South Wales Government of the defence industry and recognising its importance. I try not to be too parochial because the defence industry in New South Wales is not the only game in town for New South Wales.

The Hon. JOHN GRAHAM: In some ways the best way to get to a less parochial approach across the Commonwealth is for New South Wales to muscle up a bit, is it not? The other States are playing aggressively. Do we have to push back a bit to get to a more rational decision-making framework or the sort of culture that you are describing across the country?

Mr HARVEY: It certainly is. I think a big step towards that is first saying that New South Wales cares. The defence strategy has three themes. One is that defence is important to New South Wales. New South Wales is also important to defence—important and good, either way—but to achieve defence aim's a truly national approach is important. So it is not just what New South Wales can get from defence but also what New South Wales does for defence. So when you take the big picture you need ongoing Commonwealth Government

support and also ongoing New South Wales Government support. I think everyone has recognised that probably in the last two years—I have been the Defence Advocate for almost two years now—there has been a big uptick in attention to that. As I say, New South Wales has a lot of strengths in a lot of areas. We need to tap into the synergy between all the strengths that New South Wales has to get a good outcome overall.

The Hon. JOHN GRAHAM: We are really looking for projects about which the Committee, the Parliament and the New South Wales team can get behind to raise awareness on the political side of the system. We have talked about a few of those—joint strike fighter [JSF] sustainment, LAND 400, SEA1000 and SEA 5000. Have you got any views on what pipeline priorities we should be focusing on in New South Wales?

Mr HARVEY: I think Commodore Scott pointed out a number. We have certainly been focused on the big ones that have a big payoff for New South Wales and specifically may need New South Wales attention. Certainly the Premier has been engaged. Before Christmas we went to RAAF Base Williamtown with the Premier to look at BAE systems there, which is focused on that JSF regional sustainment hub. Now that is something we are not in competition with other States about; it is Australia in competition with Japan and South Korea. Again, it makes a lot of sense to all work together on that. Minister Pyne has been very strong in supporting that activity. Again, we need to work nationally and focus on where New South Wales is a key beneficiary and needs to make the step up to that. Also on the SEA1000, particularly Thales here in Sydney with its sonar. It would be a great outcome for New South Wales and a great outcome for Australia if that sonar were the solution for the submarines and the ships. We try to focus on the big ones with a good outcome for us and a good outcome for the country overall.

The Hon. JOHN GRAHAM: I turn now to the Hunter question, in particular the JSF sustainment. It would be a remarkable outcome for New South Wales and the country if we were able to strengthen our support for that project. What is the number one thing we can do to support that project?

Mr HAWES: If you spoke to those businesses or industries today—interestingly, they have a borderless approach to what they are trying to do in the defence space—as Mr Harvey pointed out, their competition is Southeast Asia for the sustainment stuff, not other States, but they happen to be located in New South Wales. At the moment one of the big issues for those guys is the ongoing rollout for employment. To go and get the right people to do what they need to do. This crosses over into science, technology, engineering and mathematics [STEM] stuff as well because right across the Hunter—and I am sure it is no different in Sydney—one of the things that employers are saying at the moment is that it is difficult to get good people, to get the right people. Now that might be short term but in other States that might not be so apparent. But certainly from New South Wales's point of view making sure that the industries have a good pipeline of people apart from projects is something that exercises—

The Hon. JOHN GRAHAM: Is there something the State Government could do to help assist with that problem?

Mr HAWES: Certainly in the STEM and education programs that have already been rolled out—some of them have been very successful in the Hunter and I am sure it would be no different in other regions that have tried that—they are producing results for these organisations in those right disciplines and the areas where they need people to be trained to be able to do the work.

The Hon. JOHN GRAHAM: Mr Harvey, what is the most practicable support we can push for in this space?

Mr HARVEY: Certainly, the science, technology engineering and maths [STEM] activity—the training of people. Currently we are working with the Commonwealth Government through the Joint Strike Fighter [JSF] project office to see what the New South Wales Government can do in terms of infrastructure support in the region to help make the Australian bid more competitive.

I was at Regents Park recently—at Thomas Global Systems—and Minister Christopher Pyne was there. I pointed out to him how important the JSF regional sustainment hub was and that the New South Wales Government was willing to work with the Commonwealth Government to make that a success. He will be going to the United States again soon to talk to the US about that. That is another example where the New South Wales Government can look at regional development funds to do infrastructure work to make the Australian bid—

The Hon. JOHN GRAHAM: What sort of infrastructure? Give us a picture of what—

Mr HARVEY: Potentially, roads and internet types of things, and even sewerage to activate new land. Potentially things such as buildings, if they are for a shared user approach.

The Hon. PAUL GREEN: I want to ask a question about my favourite part of the State.

The Hon. MICK VEITCH: Here we go—the North Coast, Broken Hill?

The Hon. PAUL GREEN: Come on—team New South Wales!

Mr HAWES: It is all the North Coast compared to Victoria.

The Hon. PAUL GREEN: That is right. Mr Koster, I note in your submission that you talk about the Shoalhaven and the industry group down there. You say that you need to evaluate ways to enhance the presence of naval weapons ranges in Jervis Bay. Do you want to comment on what you mean by that?

Mr KOSTER: Within the Defence white paper there is a call for the Australian Defence Force to have an anti ship missile capability. Beecroft weapons range is the perfect location. I could imagine that the army may prefer it up north, where the majority of troops are, but—

The Hon. PAUL GREEN: In the north of New South Wales or does "north" mean in Queensland?

Mr KOSTER: Queensland. We could see that having it at Beecroft would be the ideal location. It is the east coast training centre. Weapons could be stored at HMAS Albatross and it could be supported by local infrastructure and local companies.

The Hon. PAUL GREEN: Do you know whether, in New South Wales, the ministry under Minister Blair is doing anything to assist in trying to secure it in that area?

Mr KOSTER: I am not aware; no. I might put that as a question on notice.

Mr HARVEY: If I could, I could add just one thing. I know there was a meeting recently in Canberra. Peter Scott went down to talk to the Australian Maritime Safety Authority—I believe that is the agency that looks after ranges et cetera. I think Ocius was the company looking at doing some work with unmanned underwater systems there, as well. I am aware there is some engagement, as a minimum, in that area.

The Hon. PAUL GREEN: I do not know whether you know about it, but one of the other submissions talks about a boxed area off the South Coast, with three different unmanned systems—above water, on water and below water. Do you have any comment on how that is progressing?

Mr HARVEY: I do not know. I was there on the day of the meeting but have not seen any of the outcomes.

The Hon. PAUL GREEN: That was another initiative I saw. You started off pretty well at ground level. Now you are global players. Can you tell us some of the challenges that you face in placing yourselves globally as an SME for a larger player?

Mr KOSTER: It is obvious, but you have to travel. We do not do any support for Defence within the Shoalhaven at all. The offices we work through are in Melbourne, Brisbane, Adelaide and Canberra, so we have to travel. It really gets down to what the customer wants. The customer, in this case, is the Department of Defence. Where does it want to see us? I enjoy living in the Shoalhaven, and we are building a business there. We can handle it.

There is a company in the Shoalhaven which does electronic warfare. The majority of its work is done in Adelaide, but it is now looking at doing some bespoke work in the Shoalhaven. There is another company which is tendering for a very large defence contract. Should that company be successful they have been told, as part of the tender requirement, to set up the facility in Queensland. It is about what the customer wants. First, you have to ask them, and that will decide how you play it. If you do not want to set up in Queensland, do not tender for the job.

Getting back to what we said in our submission about the Shoalhaven, we have to start looking at what we want to be able to do and what low-hanging fruit has not been picked by someone else. Although you can put all your eggs in the basket of a project, is that really what the customer wants? I will go into a whole new area, now, with respect to forming teams. The customer may say, "I want that from that team, that from that team and that from that team." That throws industry into a bit of a tizz, but we will get over it.

We are looking at what we can do in the Shoalhaven and where we can find things. Other companies around the world may have too much on their plates—they may want to offset something. We look at whether we can assemble it or manufacture it in the Shoalhaven and then send it out to the world. In that area we are never going to get approval to do heavy engineering. Why would you do that there if you already have a set-up in Wollongong? You would be better off going to Wollongong and doing it there. Let us look at the things that are palatable to the environment in general. I am talking about the environment and the people who live down there. The Shoalhaven is a retirement village. Someone is going to thump me for saying that, but that is what a

lot of people are doing. They do not want to see things that are going to spoil their backyard. Let us be cognisant of that fact.

If we do things in sheds—no-one really knows what we are doing in there, and it is not affecting the environment or those sort of things—that is the direction we are trying to take. On the other foot you have a customer who wants to set up a helicopter training facility at HMAS Albatross. Now we have something to aim for. Over the last few years Lockheed Martin has come in on the back of Sikorsky. They were not there before. They were not there 10 years ago. BAE Systems has been there since Adam was a boy. Some of the other companies have come in and gone. We are starting to see a hub of expertise ranging from highly qualified engineers right across to the other support networks needed to support an aircraft or a system. If we look what the customer wants to do and start to build around that we cannot go wrong.

The Hon. PAUL GREEN: I think you were talking about Sussex Inlet when you were talking about a retirement village!

Mr KOSTER: Yes, I was.

The Hon. PAUL GREEN: Can you give us a snapshot of the links? In your submission you talk about good transport connections between Shoalhaven and Canberra being critical for defence industries. In one of our other inquiries we heard about big business going south of the border, to Victoria, because there were certain initiatives there—so New South Wales loses all these job opportunities. That connection between Canberra and Shoalhaven keeps the jobs in New South Wales, does it not?

Mr KOSTER: It does. There is the road. Main Road 92 has been great—time flies—over at least the last 10 years. The road has been upgraded. Now it has got to the stage where it is so popular that it is overused for what it is capable of delivering. So the speed limit has been reduced. That is fine, but a lot of work needs to go into making it a real route.

When you bring overseas people into the Shoalhaven and you say, "We are going to Canberra tomorrow and we are leaving at 6.00 a.m.," they are—"shocked" is the wrong word—quite taken aback at where we are going. They keep looking at me as if to say, "Where are you taking me?" because we are going through nothing, and they are not used to it. I have had people say, "We don't want to come and see you in Nowra because it is too far away." I said to one guy, "Okay, we are delivering this equipment to Moorebank. Where would you prefer that we manufactured this gear?" He said, "In Sydney." I said, "Okay, let's go to the western suburbs." We went out to St Marys. I said, "Put your stop clock on. We'll go to Moorebank." It took us 2½ hours to get to Moorebank. I said, "We'll go down to Nowra, where we are building. Put your stop clock on." We were there in 90 minutes. And he went, "Oh". It is all relative, and that is the thing we have got to get over, that people think that, okay, they are coming into Sydney and they will stay in Sydney because it is easier—the airport is there, the accommodation is there, everything is nice and easy for them. You go to Nowra or you go to Newcastle, they think that is the backblocks and they say, "How are we going to get there? It is just too far". It is relative and it is up to us to sell that to the companies who want to invest. I do not know whether or not I have answered your question.

The Hon. PAUL GREEN: I think it is important. We talk about Sydney-centric and we know that it has all the services, it has the infrastructure, it has the planes flying in and there is rail and all sorts of things. But when you are in a regional area we do not have the train; you have your road structure and they are important connectivity points for us to keep the jobs in the regional areas. In your submission at 3.3 you say, "larger team and inter-agency planning and activity is more complex and variable. Task Group, whole-of-ADF and broader 'Coalition' response to HADR". Can you maybe talk about that? You talk about Shoalhaven being ideally placed to host this opportunity. What is the reality of this? Does this sit somewhere in New South Wales now?

Mr KOSTER: No. We used to do it. The navy had a facility at Jervis Bay airfield which they built after Cyclone Tracy. There was a village that had been wrecked, so there was an area where we could fly people in, bring them in—you have air, land and sea access to the spot—to then coordinate and teach people how to respond in a disaster area. That, to the best of my knowledge, is not being done anywhere in Australia. We have an air warfare centre up in the Hunter; let us have a humanitarian and disaster relief centre of excellence in the Shoalhaven port in New South Wales. We are perfectly located to do that and it would be something that I believe defence would be interested in. We could then fly into Albatross the C-17s with cargo loads of equipment; they could then be trucked into Jervis Bay. You have relatively remote locations and you could certainly have any type of exercise area you wanted and build a village there that has been wrecked and has casualties. We do not train for it.

The Hon. MICK VEITCH: The previous panel explored for a little while the need for system integrators, the fact that we probably do not have them in Australia or, if there are, there are not many of them.

What are your views about the need for system integrators, maybe Mr Koster and Mr Hawes? How has that impacted on the regions either positively or negatively?

Mr HAWES: In "system integrators" you mean people that can assist that collaboration?

The Hon. MICK VEITCH: Yes.

Mr HAWES: I think it is a fair point. I think that one of the things we have recognised in the excellent work that was done to set up Defence NSW was that for the first time we got documented what we have got across the State and within each of the regions in that defence ecosystem. But, to me, if I was using a cycling analogy: the bike is not broken but it is not race-tuned. We have got these individual parts that I think everyone here knows that the sum of the parts, the whole, could perform far greater than each of these bits by themselves. To some extent we have got industries that do collaborate across areas—as I said, they are borderless; they do not care whether somebody else is based in South Australia or Victoria. Where there is a buck, and Australian defence is throwing that money in it, the resourceful ones will follow it; they will not say, "Oh no, I can't go there because I am crossing a State boundary".

But that knowledge within that ecosystem could be vastly improved, from what we observe. It is almost like we do our own study. I am learning stuff here listening to what Mr Koster has got to say about the South Coast, and I am sure if I started talking about bits he would start learning about the Hunter. Then, all of a sudden, all that knowledge becomes a much more powerful brokering or leveraging opportunity than what we currently have. I do not know where it could end, but I just know the feeling around is that it can be improved. As I said, it is not busted and we have got some good seeds, particularly now at a government level, with what John and Peter can do, which we did not have before and for which we have been crying out for ages. But now how do we make that system absolutely better? I think there are a number of ways we can do that. It would be a great opportunity to explore.

Mr KOSTER: I think some of the most striking examples have been the trade shows where we have been on a stand and the amount of business that is done amongst the exhibitors themselves on the stands probably surpasses what happened with the people that are walking the floor. Companies are starting to find out about other companies and they are starting to do some good work together. You will always have the problem where "If I just tell him that bit then he might pinch the idea and run off and do it." That is always going to happen.

The Hon. MICK VEITCH: Competitive tension is always good.

Mr KOSTER: Yes. But the more that the New South Wales Government is acting as a focal point the better it is for everyone because, as Mr Hawes said, it is the sum of the parts and how we can start going, "We really can do that." At the Nowra show a couple of weeks ago—I have been looking for a company that can do 3D printing, a particular type of 3D printing, all around the place, and in Nowra it is one street away. I had no idea that they were there and it was only from being at the show. So it is that sort of thing where you do not know what you do not know. The more we can start working together and getting it together the better off we will be.

The Hon. MICK VEITCH: Mr Goodsell?

Mr GOODSSELL: We know when we have examined other big market opportunities, like the mining boom, that Australia has been traditionally a land of the rugged individualist and we have tended to not integrate the systems that lie around us very well. The Government has played its part in some jurisdictions by being very hands-off or feeling it was not appropriate, but also business itself has culturally not been sort of a strong self-integrator. I chair the New South Wales Industry Capability Network [ICN], which for nearly 30 years the State Government has funded to play a small part in that integration, and regularly I have to remind the relevant Minister that it exists, and it does exactly this thing: its potential is to tell companies that there is a company up the road that has the capability to do exactly what they are looking for.

I think at a policy level we struggle with how you formalise that kind of what is often just serendipitous connection, but it does not mean it is not worth trying. So I think the thing for the State Government is to understand the existing mechanisms it has got, the existing mapping and the existing points of leverage it has already got into industry, whether it is through the ICN or it is through other government programs, through the big purchasing agencies outside the fence who already buy things off some of these companies, and try to collate that information. It is something the country does not do well, and New South Wales—and perhaps New South Wales, because of the robustness of our mixed economy, the cost of us not doing it has been lower than, say, South Australia not doing it. But if our industrial future depends over the next 20 years on the major contribution from something like defence I think we cannot afford to be too hands-off in that regard.

The Hon. MICK VEITCH: Air Marshal, what are your views about the need for these integrators?

Mr HARVEY: I will start off by saying that systems integration happens at a couple of levels. At the very top level you have got somebody to integrate the Joint Strike Fighter, the Air Warfare Destroyer, the Wedgetail aircraft; that is sort of a whole-of-defence attitude so you need some smarts to do that. That is one level, but I think what we are talking about here is like a platform. Who integrates the bits on a particular platform?

While the general view is that Australia has a large number of SMEs and a few international primes that do the integration task, it is not clear cut because at the international prime level it often involves an Australian element of the prime in this country. For example, BAE Systems recently won the Jindalee Operational Radar Network [JORN] project. BAE Systems Australia won the job and almost everyone doing that work will be Australian. Is BAE Systems Australian or not? It is definitely a systems integrator and its employees are Australians and it pays Australian taxes. Another example is Saab, which develops a combat system in Australia involving Australian intellectual property [IP] and Australian workers. Thales produces the Bushmaster and the Hawkei. Again, it is an international company, but the work is done here in Australia.

It is a bit more nuanced than saying Australia does not have any integrators. Certainly, the Defence view now is that it would like to deal with a smaller number of integrators while ensuring that work flows down to SMEs. Chris Jenkins from Thales said that he wants to expand his business, but he does not want to employ any more people. He wants to make sure that work flows out to SMEs. We need to understand the nature of the work environment as we go ahead. It is slightly different from what is sometimes characterised.

The Hon. MICK VEITCH: What public policy levers should the Government pull to facilitate that sort of connection between the SMEs and primes?

Mr HARVEY: It is largely up to the Commonwealth Government, and the vehicles would be the Defence Industry Capability Plan and sovereign industry capabilities. One I am always keen on is the integration of the top-level system. That should be done on a sovereign basis because no-one else has our system. Beyond that, it is okay for primes or representatives of primes from other countries to do the work here while maximising Australian workers as much as possible and retaining the IP. We must also ensure that we can sustain the system after that because that is a key part of that activity.

Mr GOODSSELL: Clearly the skills scene is a domestic lever. As Mr Harvey said, sometimes the work might be done by an offshore entity, but it is effectively an Australian effort. That is a function of the skills that can be found. It is probably not sufficient, particularly at the State level, but it is absolutely necessary that the skilling is done correctly, and that starts at high school. We are talking about 20 years hence and the people who will be working at the end of this kind of program. They are in high school or primary school now, so it is a long-term thing. This is not limited to the Defence sector; there are opportunities outside the sector that can flow from that same effort. However, the defence sector is a good focal point at the moment for that kind of function.

There are two dimensions. If we are talking about the manufacturing supply chain into the defence sector, manufacturing is going quite well in Australia, but no-one believes it. That is one of its problems; the future workforce is not as enthusiastic as we would like it to be about the opportunities in manufacturing. When we talk about skilling activity and focus starting at the school level, it has the secondary effect of enthusing people about a broader range of careers that include defence industries and the broader manufacturing sector.

Because of technological waves, Australia has opportunities to be dealt back into the game if we take them. The theory that everything will be made in a mega-factory in China has been proven not to be true. There is no guarantee that Australia will get its fair share, but if we get the settings right we can. The primary setting is the thinking and the learning that happens in the teenage years and in families about what career options are available and what good, long-term and fulfilling jobs look like. It is about both skilling and industry attraction.

The Hon. MICK VEITCH: Mr Koster, what policy levers should the Committee recommend to the Government?

Mr KOSTER: Definitely skilling. It is again about what the customer wants. The customer will buy a Joint Strike Fighter from a proven manufacturer. However, it is very unlikely that we will design and build one indigenously. They will look for something elsewhere. They are the big jobs that make the headlines, but there are many smaller projects in the \$10 million to \$15 million area that the Government is very keen for small- to medium-sized enterprises to take on. If we have the kids coming through with the interest, the desire and the ability to go into those companies, we are home and hosed.

The problem we are finding at the moment is that we have a lot of kids in the Shoalhaven who have given up; they do not see an opportunity. They believe they have to go to Wollongong or Sydney; they cannot

stay local. Part of our group push this year is to get to schools to show kids what we are doing and to give them some hope. I think we covered the skilling level in our last open session. The range of courses that used to be available in the Shoalhaven has diminished, and the courses we are looking for have gone. That is the problem.

Mr HAWES: I made the point earlier about skills. From a Hunter perspective, Regional Development Australia [RDA] Hunter lodged an excellent submission showing the potential level of return from that investment if we focus on it. I refer the inquiry to that submission. I find it intriguing that the whole structure is so complicated and elaborate. If there were one single answer, it would have been implemented. Some significant steps have been taken in the past 12 months to two years by both State and Federal governments to make it easier and also more of a challenge. If it were a corporation, the people at the top of the tree who are talking to the national defence guys all the time cannot know about the little SME making the special stainless steel widget that goes into the back end of a plane, how much it will charge and so on. That sifting-down process has deliberate and discrete steps to get it right.

At the moment with the way Defence Australia is busting up things compared to how it used to do it, there is an opportunity for the big primes to engage with a lot of subcontractors or contractors that can do the job. Speaking from our perspective, the way that was set up is a good way to leverage from that bottom-up approach as opposed to waiting for the big drops to fall out of sky from the Commonwealth, like a desire to build tanks in New South Wales. The issue is the capability of the people coming up from the bottom. We have a platform that engages well with SMEs and primes to be able to understand their business and how they do it. I am sure we are not the only ones with those programs, but they are not being utilised enough. The Government could better engage with us to make more of that as we grow this system.

Peter Scott and John Harvey cannot do everything because there are limited resources in the department. However, we can help that process through funding or working out programs. For example, HunterNet Group Training Company runs an icluster collaboration platform that all the primes use to understand where they will get products and services. It is not licensed well across Australia and they might be the only users in New South Wales. They want to develop that more and to share it. It would be great to be able to share it with the South Coast and the rest of New South Wales. We are going to need support to do that. Those are the things that come down to the corporate level. I understand all the guys on the board and they do not need to know and cannot possibly know it all, but the integration and the steps that come down are important. Maybe we need our own trade day where we will get together and work out how to do that better.

The CHAIR: AI Group ran a Greater Hunter Makers Festival. Could you outline some of the benefits from that? We heard earlier of the "hidden gems" throughout New South Wales in the Defence manufacturing space. It is fascinating to work out how they can they can be uncovered.

Mr GOODSSELL: The idea came from a series of overseas trips that some of our local Hunter members made to Germany and Pittsburgh, North America. In Germany they looked at what the future of manufacturing looked like and in Pittsburgh they looked at the reconstruction of traditional manufacturing areas. One of the ideas that came back was to celebrate the making of things in an environment where the general perception was, "The car industry is going and we do not make anything here anymore." We have run it only once and we intend to run it again this year. It had strong support from the State Government and there was a really good engagement with schools and the youth of the region. It reinforced a reality—I do not think I have to tell members of Parliament—about the differences in regions and cultures.

The Hunter is very much a trade town. People understand what an apprenticeship is and they understand what manufacturing is even if there was a sense of anxiety about the future. It was building on what was there and had great engagement with uncovering the hidden gems. The most frequent comment that was made by visitors to the makers fair was, "I did not know we made that here." It also excited school kids about what you could do if you stayed awake in maths class. When we talk about science, technology, engineering and mathematics [STEM], it is as much about the teaching of it as careers in it. It is about putting it in context. It was a successful program which we intend to continue. It is a product of the Hunter and may not translate to other regions in that form. One of the things we have learnt with many of the programs is that regions have to reinvent their own solutions. You cannot always translate them to other regions. Even if the issues appear the same the culture is different and there needs to be a sense of local ownership.

The CHAIR: Mr Hawes, would you like to expand? We heard earlier about the "hidden gems". Are there any projects or businesses in the Hunter that have world-class projects that are not advertised or known about? As Mr Goodsell said, we did not know it was made there. You spoke earlier about the integrative clustering method [icluster] collaboration.

Mr HAWES: It is an information sharing network.

The CHAIR: Are there any specific stories to come out of that?

Mr HAWES: Every region has a story. Mr Koster just gave an example of not knowing his 3D printer guy lived around the corner. There are interesting stories coming out, particularly now, about some of the work towards the Joint Strike Fighter [JSF] and the sustainment program there and the capability of some of the companies we do have. We have a history of people who melt, bend and make things and it is a matter of how they turn their hand and their skills to newer technologies. It is almost like when the Committee went and did field days and looked at the Hunter. We, as industry groups and different organisations, need to do that ourselves within the State to properly understand what goes on behind the scenes and what these guys are doing.

I missed the Sydney Aerospace and Defence Interest Group guys this morning. I am sure you would have heard plenty of stories of people who are breaking their necks to get into this area, particularly with the JSF and other programs being rolled out by the Commonwealth. Thales now have a foot in the port of Newcastle. Civmec are doing stuff in all sorts of areas. Varleys are well known. Nothing holds Jeff back. He knows he has to get out there and do it. He knows if he waited for the light at the end of the tunnel to come to him he would still be waiting, so he charges down the tunnel to get it. There are lots of good industry examples like that. What keeps coming back to me and what I keep hearing is that we can do better. Some of the comments that we have heard today reinforce that and suggest there are ways we can improve.

The CHAIR: How would you see the Hunter Defence and the Hunter Defence Strategy program expanding? Am I right in saying it has been in operation for five years? What specific recommendations would you like to come out of this Committee for the Hunter Defence Support Network?

Mr HAWES: It is probably in a hiatus at the moment in the change that has been happening in defence. Hunter Defence got to a point where it was an advocate for the full range of those industries based in the region and how we could help them project their voice but also share knowledge and understand what their issues were to advocate for change on their behalf. I look at it as a bottom-up and a top-down approach. What has changed a lot in the New South Wales Government and the Federal sphere is the top-down stuff. It is a lot clearer and there is a lot more transparency. There is a lot more understanding and determination, and a will to be involved.

The bottom-up stuff is where you have the range of industries in this space that can vary from someone at Williamtown who is very highly specialised in what they do and they are only employing four or five people, but they are critical to a supply chain within a particular area, right through to the Varleys and the Civmecs and Talis and those guys who are employing hundreds of people and play a completely different role. Getting the understanding of that bottom up of what is there is where HunterNet has played a very important role.

At the moment we are struggling, because of funding issues, to keep resources going. I do not know whether long-term the model we have is necessarily what we need. For the next three to five years, to get that level of understanding and that knowledge to keep coming up from the bottom as well as coming down from the top, it is a vital piece of the ecosystem. If I was to be asked by the Government as to how to support it we would be happy to talk as to how to collaborate to make sure it kept going and that would involve funding to keep the resources going that make it work.

The CHAIR: Williamtown is important to the Hunter region. Do you see the aerotropolis at Badgerys Creek complementing the strengths of the aircraft industry in New South Wales or is it a threat to Williamtown and the Hunter region?

Mr HAWES: That is a good question. In our submission we did point out that we were not accusing anybody but certainly it does not make sense to us to be putting up things which compete with areas that have a strong comparative advantage. There is an enormous investment inertia that has been developed in the Hunter region around the aerospace. I have no doubt that RAAF Williamtown is not going anywhere in a hurry. You are not about to pick up the whole thing and dump it out to Badgerys Creek. The companies that wish to make decisions about locating there to service that industry, that is fine. We would be concerned about where Government has made decisions that tilted the balance or that level playing field or took something away that is already there. To us that does not make sense. From the sounds we are hearing from Mr Harvey's and Commodore Scott's areas, no.

There is a distinct idea or a distinct philosophy about the roles those different areas can play. Certainly the Hunter is about the guys that manufacture, make and produce, whereas what Grumman is doing—and what we understand it is intending to do around other places that are already happening—might be around data and other areas. Mr Harvey might have some comment on that. Where we can do that, where we have that specialisation, that is fantastic. But it would not make sense for duplication or where we are deliberately having things that instead of complementing each other are competing with each other and that do not realise the real

effort or the real opportunity that exists in the region where we have labour, we have firms that are already based there and all those other things compared to, say, Western Sydney.

The CHAIR: I would like to hear a bit more about the ME program run by RDA Hunter. How was it developed? Was it a success to the extent that it should be replicated throughout New South Wales?

Mr HAWES: I would probably have to take that on notice and get some details. I know that they speak highly of the outcomes they got from the program. I suggest that we take it on notice or refer directly to RDA. I think they would welcome the opportunity to provide further comment.

The Hon. JOHN GRAHAM: I go back to the previous direction you were running to perhaps get a view from Air Marshall Harvey about how we are to differentiate between those two areas?

Mr HARVEY: Certainly the aim is not to be in competition at all with Williamtown. The aim is to bring in additional work whilst there would be an element, we think, of bringing some defence-aerospace work. I think the focus will be different so it is looking at work that is otherwise done overseas that we can bring into Australia. It is certainly not looking to compete with Williamtown at all.

The Hon. JOHN GRAHAM: Do you agree with the description that one might focus on manufacturing and one might focus on data? Is that a good broad characterisation or is it too early to say?

Mr HARVEY: Potentially I think Williamtown, certainly at the top end, would be focused on RAAF activities. I think there is more scope for civilian type aviation work at the aerotropolis which I think is the correct term now. There is scope there for a lot more newer type industries—maybe the heavy manufacturing will be out of that area, maybe some of the smarts. The cyber activities might be more appropriate in a newly developed area. One of the things we are looking at is how do you establish the area there so it is attractive with the levels of security needed to work in the cyber area. It is very much to try to bring in new work there to leverage off the development of the airport and the city's deal as well—the money that is coming in. I think from memory the numbers are saying that we are looking at jobs for about 300,000 people in Western Sydney City over the next decade or so. A lot of work is there for skilled workers with that opportunity. We are looking for that growth.

The Hon. JOHN GRAHAM: Mr Hawes, I accept your point that we need to make sure both of these areas go ahead, given the focus, the attention and the investment in the Badgerys Creek area. Does that not really mean that that will not stop but we need to have another look at the Williamtown area and at what investment, support and focus could be brought up there. This is really an opportunity to do that, is it not?

Mr HAWES: Yes, there is. I think Mr Goodsell or Mr Harvey alluded to the issue around what could happen in areas where we could assist with infrastructure and other stuff. There is a case in point at Williamtown right now. The civil side of the airport is owned half by Port Stephens council and half by Newcastle council, as you know. They have their foot on quite a large piece of land that for a long time has been earmarked potentially for a defence and aero support industry zone. But it is not a silk purse by any means; it is a bit of a sow's ear when it comes to a block of land with drainage issues and the PFAS things that are around. Government support and assistance around some of the measures that they are trying to do there would make great gains for them to be able to achieve just that. I appreciate there is an enormous investment focus on Western Sydney and it would not take anything like the money that is being committed out there in some of the infrastructure constraints they have up there to get that project going and to kick some goals.

The Hon. JOHN GRAHAM: When you combine the RAAF base and the civilian side of the airport, there is no bigger infrastructure lever to shape the future of the Hunter Valley than what happens there over the next couple of decades. It is crucial for the development of the area.

Mr HAWES: Yes, I would agree with that.

The Hon. NATASHA MACLAREN-JONES: I notice in the Hunter submission reference to the industry action plan relating to aero space and in particular workshops. I am interested to know what you think should be in that plan. Air Vice Marshall Harvey might be able to update the Committee as to where it is up to in releasing the draft.

Mr HAWES: Some of the stuff we were referring to in there was very broad but once again it comes back to that detailed capability of what industry organisations can do to try to engage with the SMEs and the industry that wants to participate.

Mr HARVEY: I think we covered one of the major activities this morning which was supporting this JSF regional sustainment hub—again, not in competition with any other States. We are in competition with Japan and South Korea for that. We are looking at working with the Federal Government and industry up in the

Hunter region to support that activity. Apart from that there are a number of activities there with aerospace defence precincts up there working with those companies and Newcastle airport—again, to see what we can do to enhance industry development in the region. So it is one of our focuses. But we are trying to work as best we can with the regional development personnel who are based in the region but also agencies such as HunterNet because they are the people on the ground and they know what is best locally. We will work with them to implement what they see as the local priorities.

The Hon. PAUL GREEN: Mr Koster, in your submission you refer to the establishment of a credit agency. You talk about the need for an independent body that understands Defence is able to review and vouch for the capability of the company and to assist the company in obtaining credit. The Committee found that young SMEs do not really know how to get this idea up and running and then sell it to a bank. You state in your submission that banks understand farming but they do not necessarily understand the defence industry. What would be your recommendation to this Committee?

Mr KOSTER: The example that was used was a company that had won a defence contract, that had taken the bank on the journey through the run-up to the tender being released, and everything was okay. It submitted the tender, won it and two weeks into the start of the contract the bank withdrew all its funding because it did not understand the requirement. The frustration for the company was that the gear being produced was to a defence specification. The bank said, "What if Defence does not like the product?" They said, "If they do not like the product it is their problem because they designed it. It is their specification." With SMEs they have these wonderful widgets. The customer, Defence, wants it. They need a cash flow and they need ongoing money to operate. The problem is that with the banks a Commonwealth contract is not worth anything. They do not see it as a requirement to pay. The example used from the bank was that if the contract was to provide a number of trucks and they happened to be painted green but Defence then turned around and said, "Well, we don't want the trucks", the bank could then respray the trucks white, pink, purple and sell them on the market, but because it is a defence piece of equipment that is usually structured for just one purpose or a restricted purpose, then there is no other avenue for sale, which is bonkers, because if you have got the contract, the customer obviously wants it.

This is holding back a number of SMEs because they just cannot get the support to go ahead and do the work. The idea from the members of Shoalhaven Defence Industry Group was: Is there a learned body that could sit around and go, "No, the contract is correct. The plans and everything being done are in accordance with the specification so there should be no problem at the end", just to give the banks that little bit of a push to go, "Lend them the money". That is really holding back SMEs because this particular company and other companies which are doing it per job—it is a \$10 million job but the owner's house, facility, bank balance do not come anywhere near \$10 million. They may have \$3.5 million or \$4 million but it is not good enough for the banks so they just go, "No", and the work goes to the next crowd or goes overseas. That is the problem.

Mr HARVEY: I would like to add to that. Given that situation, the Centre for Defence Industry Capability has been set up to address those sorts of things and we will certainly work with Mr Koster on that through them. Related to that—this is focused on the export area though—the Export Finance and Insurance Corporation [EFIC] was set up to assist companies trying to export their equipment overseas. Defence often had a problem back in the old days of the Joint Strike Fighter because banks did not understand the Joint Strike Fighter. It was not actually proved yet that it was going there; they had trouble getting finance. The recent Defence Export Strategy announced \$3.6 billion in support for potential export into the defence area under the Government support. This does not directly address what Mr Koster was saying but part of the problem identified, particularly with export, is to try to support them but certainly Defence NSW can work with the Centre for Defence Industry Capability to raise the issue and see what can be done about it.

The Hon. NATASHA MACLAREN-JONES: There was discussion this morning about advisory councils and ministerial councils. I am interested to hear the opinion of members here as to whether it would or would not work or whether it is more a question of wait and see and that it be revisited in a few years time?

Mr HARVEY: We do not have a specific advisory council as such in New South Wales but the Minister and the previous Minister in developing the strategy brought together industry representatives to consult and advise on that strategy as we went forward. As mentioned this morning, there is the Parliamentary Friends of Defence group and in future, now that we are just over a year into the strategy, I believe there is a plan to get a group together again to look at what that was. It is a question really of what is the best way. Do you have a dedicated group or do you form groups as required? I expect the Minister will make decisions once he sees the results of this inquiry as to what is the best way to go ahead.

Mr HAWES: At the moment I see this as an exercise and a pathway where we are a year into that strategy but it would be interesting to do that exercise to see what gaps are still there. We do a lot of

comparisons with the other States to see if someone has done it better so rather than just put in another level of governance by way of having a structure, do some sort of an analysis to understand where we are now, where we are trying to get to, what is the gap and whether that sort of structure is the right thing to put in place, whether it be industry based, government based or a combination of both. As to when, I agree with Mr Harvey. I think the review he mentioned would be a good opportunity to properly assess that and if it adds horsepower to what we are all trying to do, then by all means do it.

Mr KOSTER: Are you talking about whether it would be a New South Wales Minister or defence matters?

The Hon. NATASHA MACLAREN-JONES: No, the discussion was about whether there would be an advisory board comprising stakeholders making recommendations, or whether there would be a ministerial council comprising key Ministers and industry making planning suggestions to the Premier, which is similar to what South Australia has but it has the advisory board, which is stakeholders as opposed to a ministerial council.

Mr KOSTER: I think stakeholders—I have to be careful what I say. I have been in a presentation where another State Minister was introduced as the Minister for Defence. It was an overseas location and it caused no end of problems because no-one knew what was going on. The Australians who were there had a bit of a snicker and went, "Oh, this is going to really go down well", but it just caused mass confusion. I would stay away from that. I would really go for an advisory board where you sat around and you went there and it was led by the Minister for Industry or something like that.

The CHAIR: I thank everyone for their time today. Any questions taken on notice should be returned to the secretariat within 21 days. Thank you again.

(The witnesses withdrew)

(Luncheon adjournment)

CHRIS ARMSTRONG, Acting New South Wales Chief Scientist and Engineer, affirmed and examined

BRADLEY WILLIAMS, Professor of Chemistry, University of Technology, Sydney, and Director, Defence Innovation Network, affirmed and examined

IVER CAIRNS, Professor in Space Physics, University of Sydney, Director, SpaceNET and Director of the ARC Training Centre for CubeSats, Unmanned Aerial Vehicles and Their Applications, affirmed and examined

ANDREW DEMPSTER, Professor, University of New South Wales School of Electrical Engineering and Telecommunications, and Director of the Australian Centre for Space Engineering Research, University of New South Wales, affirmed and examined

GREGOR FERGUSON, Chair, Innovation Subcommittee, Sydney Aerospace and Defence Interest Group, sworn and examined

THERESE O'DWYER, Acting Executive Officer, Regional Development Australia, on former oath

PETER SCOTT, Director, Defence NSW, on former oath

JOHN HARVEY, New South Wales Defence Advocate, on former affirmation

The CHAIR: The third session today will focus on research and innovation, including space capability. Would any of you like to make a short opening statement?

Professor WILLIAMS: Thank you for the opportunity to be present as a witness today. The Defence Innovation Network [DIN] is a New South Wales State-funded initiative that brings together seven leading New South Wales universities. It has a close tie with the Defence Science Technology Group [DST] via an embedded DST staff member as associate director. The intentions of the DIN are to assist research and innovation in the State in the first instance and more widely in the second, with the distinct focus on defence. Our seven member - universities bring a depth and scope of skills, core competencies and facilities to bear for the defence industry in a way that is unprecedented in New South Wales. The simple act of providing a single portal to seven universities is a major step forward and is seen by defence companies, especially small- to medium-sized enterprises as a boon. We believe in the intentions and objectives of the DIN and are working hard to ensure its success. Each of the member universities has made noteworthy commitments to the DIN, which cover the next few years in the form of doctoral stipends and in-kind logistical and other support.

My discussions with a wide range of academics have been met with enthusiasm to participate. More importantly, there is a lot of support and interest from the defence companies themselves. We are strong supporters of the development of skills and talent—after all, that is our core business as universities—and I have some comments to make at the appropriate time relating to the support of science, technology, engineering and mathematics [STEM] skills and future talent for the defence industry relating to industry doctorates, postgraduate internships and undergraduate internships, which I will be happy to expand on during this session. We believe in an integrated approach to providing solutions technology and capability needs. Integrated in the sense of the best teams being drawn from across our member universities. Integrated in the sense of those teams complementing and working in collaboration with high-end but sometimes focused expertise in companies, and working alongside the depth the DST group brings. To this end we are fostering relationships with, for example, the emerging New South Wales Cybersecurity Network, which is also in its first year of existence, as well as between the States—with Victoria's Defence Science Institute and South Australia's Defence Innovation Partnership.

The three defence networks have had a couple of meetings this year, with a third is being hosted here in Sydney in June, in an attempt to identify common approaches where relevant and collaborative efforts towards, for example, outreach and representation at defence-facing events and hosting international defence delegations. In closing, I would like to say that the DIN is an investment by the New South Wales State Government and a specific statement of support for the defence industry in New South Wales. What would make that statement stronger and allow the DIN to function more deliberately would be if that statement carried secure funding with it for a medium-term period. Right now we have secure funding for only a 12-month period. I will also raise this point in more detail later in this session, if appropriate. Thank you.

Dr ARMSTRONG: I begin by acknowledging the traditional owners of the land, the Gadigal people of the Eora nation, and pay my respects to elders past, present and future. I would also like to thank the Chair and the members of the Standing Committee on State Development for the invitation to participate in today's roundtable discussion. The Chief Scientist and Engineer's role has two primary responsibilities: to foster and

encourage a lively State innovation system, particularly by promoting productive links between business, the professions, universities and government; and to provide independent advice on how to address difficult policy problems that involve engineering or science and that advice can be provided by reviews, inquiries or participation on committees. The Office of the New South Wales Chief Scientist and Engineer consults widely with academia, industry and government to ensure scientific knowledge and research can be adapted and used to the benefit of New South Wales.

New South Wales universities, and the research sector more broadly, have strength in a wide range of research and development fields with applications in the defence industry—examples would be in material science, sensor technology, data analytics, quantum physics, autonomous systems or robotics. New South Wales also has capabilities in space-related technologies, which includes the previous categories I have mentioned as well as imaging, astronomy and satellite technologies. New South Wales universities are great problem solvers. We can use their expertise and innovation at the cutting edge of science and technology to solve future problems in the defence arena.

The mechanism through which our office works include the following. We identify opportunities for collaboration and partnerships between members of the research and development sector, and people working in innovation and entrepreneurship in industry. Our office manages the Government's Research Attraction and Acceleration Program [RAAP], which is used to cofund a range of collaborative research entities such as Australian Research Council centres of excellence, Cooperative Research Centres, and research infrastructure facilities, as part of the National Collaborative Research Infrastructure Strategy [NCRIS]. We support the three research networks, of which the Defence Innovation Network is one. We also support programs that relate to science and outreach, such as events through National Science Week, the Premier's prizes for science and engineering, and conference sponsorship and support.

Professor CAIRNS: Thank you for the opportunity to participate in this public roundtable and to provide the written statement, which I believe I can consider tabled.

The CHAIR: Yes.

Professor CAIRNS: I am the Director of Sydney SpaceNET, which links the University of Sydney's interest in space research and industry, focusing primarily on earth observations from space. The ARC Training Centre for CubeSats, UAVs and their Applications, links the University of Sydney and the University of New South Wales with four corporations, four Government units interested in space and two American universities. Our primary aim is to develop human capital for a real Australian space industry to solve specific research problems and then to create commercial value.

My remarks mostly relate to your question 11. My first point is that the time for the State of New South Wales to take action in relation to space is now; it is not after all the other states have declared themselves. We need to act now, while it is possible to have selected areas of first-mover advantage. We should not be bashful; we should, instead, emphasise that, based on the expertise we have in space engineering, industry and science, New South Wales has the dominant space sector of any of Australia's States. That dominance is across academic space research and space industry. We should be trying to lead—not follow. Arguably, the space city state of Australia is not Adelaide, South Australia or Canberra, the Australian Capital Territory; it is Sydney, New South Wales. We have the space researchers. We have the new and growing Indigenous based space industry firms and we have accelerators. We have arguably what we need to have a dominant position.

One question is what the Australian space agency and the New South Wales space effort should look like. Should it be focused entirely on the space industry or should it be broad based? I argue that it should be broad based and not focused only on industry. We should develop a space sector which has indigenous and sovereign capability in most broad areas, but not in all things. The focus should be on areas where we have clear strategic needs or competitive advantages. It should not be based on the international aerospace primes. We cannot rely upon them to satisfy our strategic long-term interests, as a nation or as a State. I turn now to suggested approaches. Uncrewed aerial vehicles [UAVs] are arguably a great thing to be looking at. That would link defence and space in defence related and civilian needs. For instance, we can apply to same sensors to UAVs or spacecraft and get complementary benefits. I will go into that in more detail.

People worry about the economic barriers to entry into space. Arguably the launch last year, on 26 May, of the INSPIRE-2 CubeSat and, prior to that, the UNSW-ECO satellite from the International Space Station demonstrated that we have broken that economic barrier if we use CubeSats and small satellites, and we have the human capital to do it. I have suggested a number of detailed proposals, which I will not go into in detail. One of them is a space sector academics program, where, essentially, we follow the same sort of route that ARC centres of excellence use, in which New South Wales would fund a number of academics across the

space sector—business as well as, for instance, physics—for three years. Then they would go onto university funding, which would mean Federal funding in this particular case.

A space launch subsidy scheme would be a very cost effective and enabling way to get a lot of people interested in space and proceeding with it. We would be able to do it after the spacecraft had been tested professionally, therefore removing the risk for the Government and for the State. I will argue for a space and UAV education scheme, and a State project, which ties to unify the various constituencies and is across industry needs and scientific goals across, for instance, earth observations, Global Navigation Satellite System [GNSS] and Global Positioning System [GPS] work, space weather and situational awareness, ionospheric physics and other sorts of areas. A natural project along those lines would be a constellation of small satellites. That would link in with learned academy plans and would have a lot of scientific, but also industry and other support.

Professor DEMPSTER: I do not have a written response, which is quite good because I would probably be duplicating some of what Professor Cairns has said. I will give you a little bit of information about my centre. We set up in 2010. We did a large project under the Australian Space Research Program on synthetic aperture radar in space and how you could map Australia at 10-metre resolution every three days for soil moisture, for instance. Subsequent to that we have done a number of space related things. Last year we were involved with the launch of two satellites—our own one that Professor Cairns mentioned, and the other was the INSPIRE-2 satellite, which was a collaboration between us, University of Sydney and the Australian National University. We also launched four of our own GPS receivers into space last year. Two of those are on defence satellites so they are DST projects. One is called Biarri; that was a Five Eyes project. Australia's involvement was relatively minor. In other words, our entire contribution was our GPS receiver, but recently they released data to show that that receiver is working well.

There is another receiver, which we also believe is working well, on the Buccaneer satellite, which is a fully Australian project. So the DST program to develop a space capability within Defence is what I have proposed in the past as being a model for what we could do on the civilian side. We need to have a very strong civilian space sector in order to support the defence space sector.

GPS or GNSS satellite navigation has been the core of the research done by my group over the years. We have done a number of projects with Defence, including being able to identify jammers of GPS to within one or two metres so that you can remove them. Personally, I have probably been one of the more prominent advocates for a space agency. I have outlined my opinions on that over the years on "The Conversation", most recently this week, putting the case for New South Wales. The New South Wales submission to the Expert Review Panel listed a whole bunch of things, but once you itemise these things you find that there are 17 different reasons why New South Wales should be the dominant State in space. If you are talking about a single State deserving to host a space agency, see that submission and also note my "The Conversation" article of last Thursday.

I disagreed with Professor Cairns when he said that the time to act is now for New South Wales. I think the time for New South Wales to act would have been about two years ago. We have been jumped on by some of the other states. The message that New South Wales is dominant is not out there. The common perception would be that South Australia and the Australian Capital Territory are the places to do all your space work, which is basically not true. That is one of the things that the space sector would be looking to the Government for just a bit of noise so that we can establish our rightful place. I might stop there. I have got a number of things I will say later but that is enough for now.

The CHAIR: Mr Ferguson?

Mr FERGUSON: I am speaking as chairman of Sydney Aerospace and Defence Interest Group [SADIG] Innovation Sub Committee. My own innovation background is based on a doctorate that I did in defence industry innovation at the University of Adelaide and more than 35 years as a member of or a journalist writing about the defence industry, particularly at the innovative end. SADIG has some of the attributes and functions of an industry association, so I will be talking in general terms, not about the detail of my colleagues here who have quite specialist and very deep knowledge. The State Government has got very limited powers to influence directly defence research and development [R&D] of acquisition programs. State governments do not fund Commonwealth defence R&D, they do not acquire defence equipment, they do not sustain defence equipment and they cannot enter into export agreements with foreign countries, foreign governments. However, State governments have a very important role to play in creating an ecosystem in which industry, academia and research institutions can thrive.

The things that a State government can control, change and enhance are addressed in the three questions this inquiry has asked. I would like to point out that SADIG is a defence and non-defence organisation, and that reflects fundamental reality that you cannot look at the defence industry in isolation.

Anything good you do for the defence industry, particularly at the high end, particularly when you are talking about linkages with research institutions and universities, is good for the rest of the manufacturing and the high-tech services sector in general and vice versa; you cannot separate the defence industry from the rest of the industry marketplace. I do have points to address all of the questions you have asked and I will wait until those come up.

The CHAIR: Ms O'Dwyer?

Ms O'DWYER: I have no more to add.

Mr SCOTT: I do not have any opening remarks other than to point to Mr Challen's comments regarding the Defence Innovation Network in his opening remarks this morning.

The CHAIR: We will begin with questioning from Committee members starting with the Hon. John Graham.

The Hon. JOHN GRAHAM: I thank the Chair and the Committee for really focusing in on this issue because I think it is one of the things that has emerged as we have been talking about these defence issues more broadly. The parallel opportunity driven by much of the same dynamics that might open up for New South Wales into this space area is starting to come into focus. I might put a question firstly to the two professors, Professor Cairns and Professor Dempster. On the views you have just put before the Committee, the space city and State is not Adelaide or Canberra but Sydney and the fact that New South Wales is the dominant State in this industry, these are pretty shocking views. It certainly would not have been the view of the Committee setting out on this defence inquiry. That really is breaking news at this end.

Professor DEMPSTER: Do you want me to read into *Hansard* the 17 reasons?

The Hon. JOHN GRAHAM: If you are able to table it I think that would help because that would certainly be useful for the Committee's considerations. How is it the case that we have been so dominant but news has not got out about that? What do we need to do to get the word out?

Professor DEMPSTER: I think one of the problems is that New South Wales is not desperate. South Australia and the ACT are desperate. The ACT probably identified space as an opportunity a long time ago—10 years ago or something—and it is only recently, with the advent of the agency, that they have started to be vocal about it. In response to the 2003 fires which went through Mount Stromlo, they built quite a fancy test facility up there, the Advanced Instrumentation Technology Centre [AITC]. That was only opened fully five years ago, or something like that, but it is a bit of a white elephant. It is a big facility for building big satellites and so on, which Australia does not do. It is not fully thought through. The way that the industry is going and I think the way that the expert review panel will report, and I am guessing, is that they will be looking at the sort of Space 2.0, which is the smaller satellites, relatively low-cost commercial components, things like this—the type of satellites that we built last year.

The Hon. JOHN GRAHAM: I just want to get you to explain that point, because it is pretty crucial. The idea that Australia would have a space industry, or New South Wales might have a space industry, really was not in focus since the fifties, but it is now because of the change in the sorts of satellites you are working on. Just talk us through why it is a fundamentally different era that we are entering into.

The CHAIR: Just before you respond, Professor Dempster, would you mind providing those 17 points you mentioned earlier on notice and then they can come back after today's hearing?

Professor DEMPSTER: On notice?

The CHAIR: Yes.

Professor CAIRNS: I am sorry, I have lost my train of thought.

Professor DEMPSTER: Talk about Space 2.0.

The Hon. JOHN GRAHAM: We are now really in the era of micro and nano satellites that is fundamentally different. It is no surprise we are here today talking about a potential space industry rather than in the 1980s. We are now in a different era, are we not?

Professor CAIRNS: Yes. I guess the real point is the advent of CubeSats where you have prescribed sizes and standard sizing, which allows you to get commercial, off-the-shelf parts, which therefore you get these economies of scale which are substantial. Instead of having to build your own solar cells you can buy them for, let us say, \$3,000 and you can have an entire CubeSat like our two, which cost less than \$A150,000 in cash. So it is the cost of a Boost Juice franchise; it is within the reach of even poor academics, without Federal or government funding for it; it is within reach of small companies. That is, I think, the big difference that has

started to roll through space research in general and space industry over the last five years. Before that it was perhaps a curiosity, but then you got these commercial, off-the-shelf parts that you could do things. So the focus now is on what you do with the tool, as in the CubeSat, rather than on just making toys for the girls and boys.

The Hon. JOHN GRAHAM: So the size has collapsed, the costs have collapsed; all of a sudden this is technology that is within the reach of Australia and New South Wales?

Professor CAIRNS: That is correct.

The Hon. JOHN GRAHAM: Over what period? How long ago? You say maybe five years.

Professor CAIRNS: I would say five years—that is approximately the right time frame. At the same time, scientific instruments have become smaller and they have smaller power requirements, et cetera, and you can do more interesting, more fundamental science with a small satellite in space now. I think those are the primary changes.

Professor DEMPSTER: What it allows us to do is to skip over that big, clunky agency, big satellite stage and go straight to what is really a classic disruptive technology. It is a disruptive technology in the two classic ways that technologies can be disruptive; one is it does what the other ones do cheaper and the other is that it does stuff that the other ones cannot do. An example would be you have got the big, expensive satellite coming over every two weeks and taking those beautiful space images, but if you have got a constellation of 50 satellites and it cost you the same amount to launch, you can get your imagery every hour. It may not be as good imagery but you have got a completely different set of projects that you can do, and the applications will follow. Then that imagery can disrupt the big one and the big one goes out of business.

The Hon. JOHN GRAHAM: Just to talk about the opportunity here—this might be a question for the Defence NSW team on notice—when I did the back-of-the-envelope maths on this it looked like an opportunity, compared to the defence opportunity, about a sixth of the size; so smaller than defence. This should not be the focus but an important opportunity, but the key thing about it was it was growing rapidly; it has grown over the last couple of decades 10 per cent a year, and this is looking to double at least over the next decade. Can you give us any information about the potential of this opportunity?

Professor CAIRNS: I would have to pull proper numbers from other publications. The prediction is that the number of CubeSats will increase by at least a factor of four over the next five years. The associated economic benefits would be in the billions of dollars. The growth rate is not "just" 10 per cent per year but 25 per cent or more. This is expected to increase faster than that simply because we are starting to get even more economies of scale as smaller companies, such as two in South Australia—Fleet Space Technologies and Myriota—are talking about building constellations with hundreds of satellites. Google and others are talking about the same sorts of numbers. They are going into the communications field as in the Internet of Space and the Internet of Things, plus Earth observations, positioning navigation and timing things. We are talking about real commercial applications.

The Hon. JOHN GRAHAM: What are Australia's and New South Wales's strengths in this area? You have referred to some of them already in the information provided to the Committee. Our research institutions have one of those key advantages, but we have others. What are New South Wales's strengths that lead you to say that this is probably the leading jurisdiction to start?

Professor CAIRNS: The primary advantage is that we have the experts in these various fields. For example, there is a number of groups at the University of Sydney involved in Earth observations and instrumentation, and there were similar groups at the University of New South Wales. The University of Technology, Sydney has similar expertise in applying and using data from observation satellites. Andrew Dempster and his group are the experts in GPS instruments in Australia. I could go down the list to include space weather and space situational awareness; that is, looking at events coming from the Sun and how they will affect human technology and our environment. I am one of the world experts in the area. We also have the Bureau of Meteorology Space Weather Services group here, and CubeSats and UAV hardware. We have partners in our training centre, including a company involved in a hyperspectral imaging instrument and use of data. AeroWave Communications, a communications satellite company, and a number of other companies are here in town.

The Hon. JOHN GRAHAM: But it is not just the experts; it is also some of the infrastructure.

Professor DEMPSTER: The New South Wales Government stated that this State has the most employees working in the space industry, the most space lawyers, the most start-up companies, and the most VCs. All of that stuff is being driven out of New South Wales. Optus and NBN are also here.

The Hon. JOHN GRAHAM: Some of the commercial ground stations are important pieces of infrastructure. Optus is at Belrose and Oxford Falls, Lockheed Martin is at Uralla, and NBN is at Wolumla and Bourke. Those ground stations are crucial infrastructure in this area.

Professor DEMPSTER: Yes. Typically that is what Australia has contributed to space in the past. We have the lowest flying space industry in the world; it is all in the ground. There are various stages. Professor Cairns was talking about downstream processing, and Australia has always been relatively strong in that area. We are now talking about the upstream side, and Australia has been absent in that area. It is where the real opportunities are starting to appear now. It is a critical time for this space 2.0 thing.

The Hon. JOHN GRAHAM: One of our advantages is the fact that we are in the Southern Hemisphere. Given the amount of air traffic, space traffic and congestion generally, particularly in terms of space observations, that is a remarkable advantage.

Professor DEMPSTER: Geography is an advantage for a number of reasons, including what you said. In addition, if we are sharing missions with other countries, as we are with some of the QB50 satellites, having a ground station that is a long way from everyone else's ground station means that as the satellite goes over we can dump all the data. That is, we can empty the satellite so that it can fill up again before it reaches the next one in the Northern Hemisphere, and that is a good thing. Having a relatively stable democracy close to the Equator also gives us real advantages when it comes to launches. We have never really exploited that, but companies are now coming in. A company has just set up at Nhulunbuy and Gilmour Aerospace Technology is setting up in Queensland. In the past there have been a lot of flaky operators in the launch area, but there are some real players now, and that is relatively new. It is partly down to geography but also to the opportunities arising in the area.

Professor CAIRNS: Mention was made of the infrastructure. The Optus communication antennas and so on are relevant to old space, but they are not so relevant to space 2.0, which needs much smaller dishes.

Mr HARVEY: In terms of the overlap, we have a memorandum of understanding in place with the Australian Capital Territory Government to work collaboratively on defence-related issues. There are also some overlaps in terms of the University of New South Wales, Canberra, which has recently opened a facility with some design capability in relation to CubeSats. I believe EOS Creative Technology Systems is based in Queanbeyan, but most of its instruments are used at Mount Stromlo. It is not a completely separate Australian Capital Territory and New South Wales thing.

The Hon. JOHN GRAHAM: That is a really good point.

Professor CAIRNS: The combination of New South Wales and the Australian Capital Territory is definitely powerful.

Professor DEMPSTER: One of our advantages is that we have two of the big universities working in space. If you add the Australian Capital Territory then we have three G8s doing space work.

Mr FERGUSON: Opportunity awareness is something that we need to get our heads around. Whatever we do in this country in the space sector, many of the opportunities and the money behind them are overseas. We need to be able to map the environment we are in on an ongoing basis and ensure that, whatever the conversation is about space, New South Wales is always a part of it and that the opportunities are always visible and accessible to players in this State. Whether they are pursuing a customer in Australia or overseas, opportunity awareness is vitally important.

The Hon. PAUL GREEN: A comment was made about developing the defence ecosystem so that it thrives. What key research and innovation priority areas should the New South Wales Government pursue?

Mr FERGUSON: I have a couple of dot points. I will go through them very quickly. I am happy to table this once I have cleaned it up. In no particular order, I believe priorities for the State Government, bearing in mind what I said earlier, should be the following: getting the defence innovation network properly established and fully staffed. I think that is really important. Supporting the efforts of the Defence Innovation Network [DIN], Defence NSW, the Office of NSW Chief Scientist and Engineer to encourage genuine networking, information sharing and collaboration between New South Wales universities that are part of the DIN and between them, industry and the Defence Science and Technology [DST] Group.

Promoting to the defence and related industries in New South Wales the supreme importance to them of collaborating with DIN, and its partner universities, with each other and with DST; working with industry associations such as the Australian Industry and Defence Network New South Wales, Sydney Aerospace and Defence Interest Group [SADIG], HunterNet and their equivalents in the Illawarra and Shoalhaven districts, to promote those links. It is very basic stuff, person to person almost, organisation to organisation. Encouraging

participation by both industry and DIN member universities in things like innovation awards programs, DST grand challenges and the Emerging and Disruptive Technology Symposium [EDTS] that DST runs every year.

Encouraging and supporting research and development commercialisation and innovation through New South Wales's portfolio of start-up, emerging, SADIC assistance programs. You have things like the TechVouchers, Minimum Viable Product grants, Building Partnerships grants, the Accelerating Growth Loan, Regional Growth Loan and Strategic Growth Loan. These are all really important. I have seen the publication from the New South Wales Government that shows a road map of how these fit in with equivalents from the Federal Government. It is really important knowing that at every stage through the innovation process you have access to a grant, a loan, some sort of support from the State as well as the Federal Government from end to end.

International links, as I mentioned earlier. That is, encouraging and nurturing government and business relationships with friendly overseas countries. In the defence market you are going to be limited, especially if you are dealing with high end stuff. You have to pick and choose who you talk to and listen to. Against this background, promoting science, technology, engineering and mathematics [STEM] education along with STEM aware careers advisers and teachers right through the school and the tertiary systems—right up to post graduate, doctoral and beyond. That is fundamental and is an ongoing challenge for the State.

The Hon. PAUL GREEN: Skill set is a worry for us. The more we want to move into deep servicing and other things we need the manpower to do it. What is your benchmark for your first comments regarding resourcing and staffing correctly? What are you measuring that against?

Mr FERGUSON: The defence innovation network is still in the stand-up phase. I have been busy with a couple of other things, but the equivalent organisations in Australia are the Defence Science Institute in Melbourne, which was stood up about 10 years ago, and the Defence Innovation Partnership in Adelaide which was stood up about two years ago, early last year. All three of them are backed by the Defence Science and Technology Group. They all have an associate director that is appointed by DST and Professor Williams is the academic co-chair of the DIN. The DSI has two directors, an engagement manager, and a couple of other staffers who have been working now for 10 years. They have quite a well honed routine of outreach, of communication, of ensuring that members are kept aware of opportunities and of sharing opportunities with members as they come up.

They recently secured, they think, something they can crow about, which is the establishment of the Lockheed Martin laboratory in Melbourne, the Science Technology Engineering Leadership and Research Laboratory [STELaRLab]. It was established last year and they head hunted the lab director from DST to run it. That is going to be doing quite a lot of fundamental research in Australia as part of a principally Victorian, but also a wider Australian, defence research and development ecosystem. Those are the benchmarks. We need to be as good as the others and better.

Professor DEMPSTER: Can I make a comment on ecosystem? We probably five years ago now set up an organisation called Delta-V New Space Alliance in Sydney, which is really to try to accelerate space start-ups. It has never had any money. What it has done is it has created a little community and that has been a really positive thing in that there are a relatively large number of space start-up companies who are collaborating with each other and helping each other and so on. But, at the moment it is almost like a social thing. If there was a way that we could turn Delta-V into something real—in other words we are asking for money—then I think that would turbo charge that effort.

The Hon. PAUL GREEN: Tell us what that would look like. If you had a grant how much would you need, what would you see happening with the grant and how would it help Delta-V take off and be far greater than it is?

Professor DEMPSTER: The role of Delta-V would be to get start-ups to the first round of funding. That is basically the idea. The start-ups in this area that we have seen do that so far, Myriota did it last week with a \$15 million first round, which is very large. Also, Gilmour Space Technologies and Fleet both did that. Myriota and Fleet are both in South Australia and Gilmour is in Queensland. What South Australia has been doing is they have been actively trying to poach promising start-ups from elsewhere. One we did lose to them was Neumann Space, which makes a particular type of thruster. It is quite a clever idea. You can more or less get any material and use it for thrusting in space and part of the idea might be to grab space junk and use it for fuel.

The Hon. PAUL GREEN: Energy from waste; I am into that.

Professor DEMPSTER: Two birds with one stone. South Australia pinched them and they are now in Adelaide. Part of what I see is to keep those people here—that group came out of Sydney University—and foster that ecosystem. The opportunities here are quite significant. I have not got a number for you. The million

dollars over two or three years was what we were thinking of. Enough to employ one or one and a half people and get on with it.

Professor CAIRNS: Part of the idea there was that Delta-V would provide the CubeSat that companies would come to with their little device that they wanted to put into space and Delta-V would handle the logistics of getting it into space and getting the data down. In some sense, what would be good to have is a subsidised launch and people who would help to build the satellites. The costs for getting into orbit are \$20,000 to \$60,000 a kilo. But, if you are only looking at a three or a six unit CubeSat that is a maximum \$360,000, which is not a lot of money. That could carry 10 little corporations' first devices to see whether they are commercially viable.

Professor DEMPSTER: It de-risks their development.

The Hon. PAUL GREEN: I understand that. If such an opportunity exists and these people come together mainly because of relationships at this point in time, because there is no funding, but if you were to bring it together with funding, would it be fair that from their future success they could give a section of their funding back into that cause to generate further opportunity through Delta-V? In that way it becomes self-generating.

Professor CAIRNS: That is right. That was one of the ideas for how to structure a Delta-V—that it should be as an accelerator. Where it got to I do not know.

The Hon. PAUL GREEN: So you give back.

Professor CAIRNS: I presented the shares, et cetera.

Dr ARMSTRONG: I want to mention a couple of areas that we have been looking at. We have been investing in a number of different capabilities that in some ways reflect some of the things that Mr Ferguson mentioned around developing enabling capabilities. We have supported the development of the Defence Innovation Network with one year of funding, as mentioned. We are about to start discussions with them about what the milestones are for the upcoming year. There is a research showcase happening in the next couple of days and my office will be attending that. It will be really good to see what things are in planning.

The other things that we have put a lot of time, effort and funding into over the years is enabling research infrastructure—research infrastructure that can support a range of different capabilities whether they are in material science or material characterisation, ICT and biomedical capabilities as well for funding through the Research Attraction Acceleration Program [RAAP]. What we do there is co-fund with other entities into this research infrastructure which is openly accessible by companies and universities across the State. That is under a national program called the National Collaborative Research Infrastructure Strategy. One area that we have been involved with is research infrastructure.

We have also developed two other networks in parallel. The first one that we started was the NSW Smart Sensing Network and then there has also been the Defence Innovation Network and the Cyber Security Network. For me those three networks sit together really well. I can see many opportunities for the three of them to collaborate together but all of them have the same philosophy of putting some money in to act as a carrot, to bring together researchers from the public sector, the private sector, companies and government agencies to help solve problems, to help collaborate and to help identify some of those opportunities that might be open. They might be interstate, they might overseas, they might be through Federal Government funding opportunities as well. So I see that as another area.

We also fund particular areas of research such as the Cooperative Research Centres in Australia but also some Australian Research Council Centres of Excellence which are very high level and very prestigious centres funded in large part by the Federal Government but around which you do collect a lot of very high skilled people and they work in areas that also can contribute to defence space. Examples could be the engineered quantum systems at Macquarie University. The robotics group at the University of Sydney used to be a Centre of Excellence as well. You can see that they really draw together like a magnet, if you will, good researchers and then industry as well. We have also funded industry transformation hubs, including Professor Cairns' hub at the University of Sydney and other ones like that as well. Again we look at both fundamental enabling solutions, as well as some direct investments, as well as innovation awards and things also that Mr Ferguson mentioned, and opportunities for young people to attend conferences and things like that. I just wanted bring that up.

Professor DEMPSTER: That is much appreciated. The support you have given, for instance, to our events and whatever, we think that money is well targeted.

Professor CAIRNS: Certainly the training centre is very happy. I might mischievously say that the fourth network you might consider funding would be the Space Innovation Network.

Professor WILLIAMS: May I make some comments relating to the same question? As I mentioned in opening, and which Dr Armstrong mentioned again now, the Defence Innovation Network stable medium-term funding is not year-to-year funding because that does not enable proper planning. Also from an operational point of view it makes things quite difficult for us. We have seen that in a recruitment drive and Mr Ferguson mentioned that in his comments. We struggle to get a large pool of applicants for what is actually quite a good position in our network and that is because you are restricted to a 12-month contract.

The Hon. MICK VEITCH: By "medium term" you mean two to five years?

Professor WILLIAMS: Yes. That is the first comment I would like to make. Some of these dovetail with what Mr Ferguson was saying a little earlier. We need a deeper recognition that defence capability, industry capability and academic capability can form part of the same machinery. There is a growing awareness that we can and should be collaborating together. But I think there is a lot more that we can do and which the DIN is perfectly set up to do, but it will need assistance from Duncan Challen's office in the form of Peter Scott and John Harvey for example, from Dr Armstrong's office and from others. From the academic side we are recognising the importance of these collaborative efforts. The carrot, of course, helps to bring academics on board with it. But then also to bring that message through to defence and the Defence Science Technology Group [DSTG] in particular. We are growing our relationship with DSTG but it takes time, and in particular with industries.

SADIG has been a very strong supporter and a lobbyist for the establishment of the Defence Innovation Network. We are now starting to get the message out to the industries but we will not have that reach by ourselves. That is why I mentioned earlier this is an integrated approach. We have to have that collaboration between the various parts of the machinery so that we have the status and the recognition that we need in order to do the job that we can to help the defence industry.

Possibly a more difficult one, which I really think is important, is developing an understanding of the capabilities that SMEs in particular can bring, and that is not the product. For example, Chris Shaw from Advanced Navigation appeared before this Committee some time ago. They produce devices that help with navigation but what is the underlying capability that they bring and how can other organisations tap into that capability? What we see from the outside is the product and we do not see that capability. Having a deeper understanding of that capability I think would be really important from the point of view of networking industries together—and we are trying to do that with the universities into the industries—because they do not necessarily see each other as collaborators and this might help them to do that. It will also help us as universities to tap into those capabilities. So it is a mutual recognition that we both bring something to the table. I think that is something that will be very useful to understand and quite difficult to execute I think.

Further, we have clear strengths in New South Wales. One is the aerospace and there is a clear focus on supporting aerospace but there are other areas of strength which include around the computing world such as artificial intelligence, machine learning and quantum computing. In addition, there is also very good sensors and sensing so we do have the Smart Sensing Network which supports that. I think around the computing side there is a distinct strength within this State. Once again the Defence Innovation Network is poised to support that because there are many defence applications.

This brings me to another point in relation to STEM education. Once again, as Mr Ferguson mentioned, this relates to question 4 which I think the Committee covered in two morning sessions—what can be done to help secure a sustainable workforce. I would say one of those is State-based internships similar to the Commonwealth. It is called Australian Postgraduate Research Internship [APRI].

How that internship works is that the Commonwealth foots 50 per cent of the bill and the enterprise then foots the other 50 per cent of the bill and that gains access to a PhD level intern for a period of three to five or three to six months. Sometimes those SMEs need a person with those grunty skills to come on board for a short period of time to give the innovation push that they need and an internship like that can really help. As Defence Innovation Network [DIN] we have taken that on board; we have an internship scheme and we will link into the APR internship. Cashflow for SMEs is a big issue so we will be assisting them to gain access to those APR internships because the hurdle is too high for many of them. We have heard about the issues that some of the start-ups have and a granting scheme could help them. We have seen good success with APR internships and a State-based scheme would certainly help those internships, in particular, with science, technology, engineering and mathematics [STEM] in New South Wales.

Another could be targeted industry doctorates. It has a similar intention but a different focus. The industry doctorate is where the company—or possibly the Defence Science and Technology Group that has different focus on the economic side of things—would come to us with a project that has the scope and depth that is appropriate for a doctoral study. Many of the universities are recognising that this is an important second string to doctoral studies. One is the fundamental type of scientific research and another is the more applied research that is industry focused. Enabling those industry doctorates in the State would be another really encouraging way to get SMEs involved in deeper innovation and in riskier, over-the-horizon type of speculative research which they cannot do by themselves and which is more suited to a PhD study.

Linking in with internships would be undergraduate internships. With engineering, for example, before graduate engineers can register there is a requirement that they have undergone a certain number of internships or a certain period of internships. So it is supporting the SMEs to get paid internships so that they can draw the very best interns into their particular company. We are supporting this high-tech sector and I agree that it is not just defence but the high-tech sector because they all feed into each other. It is drawing the very best of those engineering students into those particular companies. Within all of that I think there should be a sub-emphasis on drawing more female students into these STEM areas. It is problematic across the board. All of the universities will tell you that this is a problem. The companies will tell you that it is a problem. It is difficult when recruiting academic staff; it is difficult when recruiting higher education students and it is difficult when the companies are recruiting staff. To get that equity and diversity that we are trying to achieve will be one of the ways in which we can really support that.

Dr ARMSTRONG: I mention two things. One is to respond to something that Professor Williams mentioned. I have actually had approval for a couple more years for the DIN but the approach that we have been taking is to look at the milestones, see where the innovation network is up to, and then plan out milestones on a year-by-year basis because it is such a dynamic environment at the moment. It is moving technology as well as the sector. We have been taking that approach but I do take your point that understanding longer term issues would be helpful as well, so it is a bit of a balance there. Another thing I wanted to mention quickly is that the Government has also established the Quantum Computing Fund, acknowledging the strength that Sydney and New South Wales have in quantum computing, so we are looking after that fund as well in our office.

The Hon. MICK VEITCH: During the opening statements a couple of you said that there were other things you would like to discuss or raise during this session. The clock is now ticking and I would hate to see us finish without you having had the opportunity to provide us with that information. Mr Ferguson, I think you had some items. If there is anything we have not touched on that you think is really important and you wanted to raise, now is your chance?

Mr FERGUSON: One of my colleague said earlier that South Australia basically usurped New South Wales' position in the space sector. There is a question of perception. I think ensuring that there is a strong New South Wales brand of presence at major events and trade expos is very important. It is about having a shopfront; it is about being visible. More importantly, it is about making sure that any time there is a conversation at the Federal Government level or anywhere else about industry capability and industry development, research and development [R and D] commercialisation, New South Wales and the players in New South Wales are part of it and they are not excluded by default. That is really important. We have to be seen to be a player.

The second is maintaining strong links with bodies such as the Defence Science and Technology [DST] group, which I think we have thanks to the Defence Innovation Network, the Centre for Defence Industry Capability—and I know there is a representative in the room—and the Defence Innovation Hub in the Department of Defence, who are talking purely defence industry or defence department opportunities and investment. Those relationships are absolutely critical, both at a working level, official to official, and at a very senior level—so State Minister, State Premier to Federal Minister, Federal Prime Minister. That is something that the South Australians have nailed. By the way, I lived there for 16 years so I saw a lot of this happening close up and personal and it was very impressive to watch.

I go back to my two earlier points. We need to maintain research and development commercialisation and innovation, and also opportunity awareness, making sure that the communications links between all the various players—industry, academia, the Government, Defence NSW, the industry associations—work horizontally as well as vertically, up and down those various chains. There really should not be any hidden knowledge and people should not be hiding stuff for themselves. We do need transparency and we need collaboration. I do not want to steal anybody else's thunder.

The Hon. MICK VEITCH: This is your last chance as we are in the dying stages.

The Hon. JOHN GRAHAM: It is not quite the last chance; I have a couple of questions.

Professor WILLIAMS: I have some additional comments to make and the first mirrors what Mr Ferguson just said about opportunity awareness. Often there is a lack of awareness within academia as to what the opportunities are in the defence industry and with the defence industry not necessarily understanding the opportunity in defence. There is not an obvious transparency. I understand that there might be security issues around some of these and clearance issues but there is not an obvious transparency as to what those opportunities are, as identified by Defence and as identified by the industry itself.

Relating to the Next Generation Technologies Fund and the Defence Innovation Hub, I think enabling some sort of connection to the "owners" of these funds is really important because the calls and the areas of the calls are often high and vague and that means that the proposals and the successes look a bit more from the outside like a level packet; maybe from the inside there is some machinery and workings that we do not understand but from the outside it certainly looks a bit like a lucky dip. I think if we have a greater link and level of transparency to those funds, what they intend with specific parts and the calls of those funds, we will have a much better success rate from the State, from the industry, from the academics and from the community of those links into those particular funds. I do not know how to do that because it is Commonwealth and State so there are some problems there. Finally, what might add strength to the proposals we have put from this State into the Next Generation Technologies Fund, for example, would be matching funds from the State into those funds, or some ratio of matching funds as a mark of investment from the State into the proposals that are going into the Commonwealth. It would make the case much stronger.

In all of these proposals what we see is in-kind support and sometimes cash support from the proposing institutions. That sends a very strong, clear message to any of the granting bodies—be they the Australian Research Council [ARC], the National Health and Medical Research Council [NHMRC] or whoever. If there is extra skin in the game it makes the case stronger. Obviously they are judged also on their technical merits but it makes the case much stronger. It would make the case even stronger yet if there is State support for proposals that are going into those national bodies.

The Hon. MICK VEITCH: Is there anything else that you would hate to walk away from here and think to yourself that you should have said?

Professor DEMPSTER: I have a couple of things. From What Professor Williams was just saying, something that you could do almost immediately would be to organise some sort of event so that the defence people and the researchers in the institutions could actually get to know what everyone is doing. That might be helpful. In terms of what Mr Ferguson was saying about visibility, the visibility at events could be provided by something like Delta-V or a space innovation network, if such a thing existed. I think the main things that I wanted to say were covered. The two key points that I wanted to make were that we really want to be thinking about Space 2.0 or the context of space is this new paradigm.

We are the Africa of space. We can jump over the landlines, forget landlines and go straight to mobile. We can go straight to this new paradigm of doing things in space without worrying about the big space thing. The other thing I wanted to stress was the whole start-up community. Australia has the second highest rate of creation of space start-ups of any country in the world despite not having a space agency. I cannot back that up. I have not got a reliable source for those numbers but I could probably find that. That was from the Delta-V community, they have come up with these numbers. That is where we need to be thinking. It is an exciting place for us to be working because those new companies always have nice research problems for us academics to investigate so everyone is happy.

The CHAIR: Would you take that question on notice?

Professor DEMPSTER: Yes. I have emailed you the seventeen points.

Professor WILLIAMS: I would like to respond, if I may, to one of the points that Professor Dempster made—that is, events to get to know each other. We do that. We have a roving event amongst the different universities. We have hosted at the University of Sydney and the next one that Dr Armstrong referred to is at the University of Wollongong. We invite companies in on a tour. We have lead researchers from that organisation accompany them on the tour and then we have tech talks from researchers across our network from the different universities talking as well to get that visibility. These are small-scale events. We plan to have a larger one when we have the formal launch of the Defence Innovation Network. That goes some way to helping Professor Dempster's question.

The CHAIR: Which body coordinates that?

Professor WILLIAMS: The Defence Innovation Network.

Professor CAIRNS: I was going to come back to the disconnect between reality and the view that—

The Hon. MICK VEITCH: I am sorry. I missed the first part of your answer.

Professor CAIRNS: The disconnect between the perception that Adelaide, South Australia are the space city and State and why that is. Part of it is that New South Wales has not had a shopfront or a declared presence or interest in space research, whereas Adelaide, South Australia have been, as Professor Dempster said, more desperate. They have needed to have reasons to be out in the public view so they have identified something that is exciting, that is relevant to the economy, especially for modern nations, and they have said, "We are going to go for that." But if you look at, for instance, the people who attended the Australian Space Research Conference over the last number of years—I do not have those statistics in front of me—the vast majority of those people come from New South Wales, they do not come from South Australia or Victoria. You can very easily see where the actual researchers are in these areas. Similarly with the industrial groups, you can see where they are as well.

I think the real need here is for New South Wales to say, "This is something that we are interested in. We want to have a position in space. We have various reasons for that." The strict economic ones could be, for instance, Australia spending roughly \$5 billion a year on space data and services. If we return 10 per cent of that to Australia, to bring it on shore, then we are talking about \$500 million and with the associated direct, indirect multiplier of five you get up to a \$2½ billion improvement to the gross domestic product [GDP]. So the economic case for getting involved is inescapable. That is what has driven the Federal Government to change its mind. The same sort of thing applies to New South Wales, of course. We have got those reasons and it does connect to defence as well. There probably should be some sort of space innovation network across the country that links in with defence, that links with smart sensors, for instance, and relates to autonomous systems and information technology as well. All of these things are connected and relevant. It would profit the State and us to behave that way.

The points about education are well taken. In part that is why the training centre program does have internships at industry groups, so as to realise that only 10 per cent of our PhD people are going to go on into academia. The rest are going to go into industry and government et cetera. We need to focus on them. Rather than viewing them as the unwanted ones we perhaps should be looking at them as being the ones we actually want. Then the same sort of statement could be made about the undergraduates as well. I think those folk are really important. I think there are multiple ways that would be very cost-effective in New South Wales to participate. Some of those would be the equivalent of science fairs. We have seen those in the news before and in the movies. That sort of thing works. It is relatively easy to do so we should do it. To launch subsidies is very cost-effective and I think that is something we should definitely be trying to do. Industry matching and Federal space agency matching funds is another area we might want to think about in the future.

At one level New South Wales should want to lead but the question is: How much do you want to lead before the Federal budget in May? I think there are a number of areas there. One thing that could bring the industry and also the academic and government groups together would be some sort of unifying project. There are various ones, for instance, in the Decadal Plan for Australian Space Science, one of which is a small constellation of CubeSats. It is very cost-effective. You would be looking at less than \$10 million for five or 10 years for 10 CubeSats. It could link in with Federal programs and with international programs. It is the sort of thing that gives us a lot of visibility and a lot of options. I would suggest that some of those things would be very cost-effective and powerful ways to do a lot of what we have been talking about here.

Mr FERGUSON: Could I just add very quickly to what Professor Cairns was saying? In this country we buy a hell of a lot of kits from overseas. It comes from companies in the main part and a few governments that have nailed the business of building relationships between industry, academia and the research institutions and bringing products and services to market. We look at it and we say, "How the hell do they do it?" I think we need a communications program that explains how they do it because it is not rocket science, and why and how we ought to be doing it as well. It is a fundamental communications challenge.

Professor DEMPSTER: I have done it. I was going to use that as an example. The product that we developed with a company in Melbourne identifies where the GPS jammers are. That is a perfect example of what Mr Ferguson said earlier about how defence and civilian applications benefit from each other. We developed that product to protect airports and ports. Once Defence saw what we were doing they jumped in; it was a no-brainer for them.

Mr FERGUSON: You are probably in the minority. We need more examples—both domestically and from overseas—about why it works, how it works and how and why we ought to be doing the same thing, and better. "Monkey see, monkey do" is a very simple philosophy but I think it works in this case.

Mr HARVEY: I know time is short so I will try to be quick. We have talked today a lot about collaboration with other states, but there are areas where there is explicit competition between states. There were

two examples recently—the LAND 400 project and the recently announced Cooperative Research Centre on Trusted Autonomous Systems. On LAND 400, New South Wales put forward a proposal that was built on a business case of how we thought that would work best for New South Wales. We were not successful. Ultimately, Queensland won, partnering with Rheinmetall. But there were a significant amount of dollars involved in that proposal.

The recent example was the Cooperative Research Centre on Trusted Autonomous Systems. On technical grounds I think you could argue that New South Wales would have been the logical home for that. Again, Queensland was chosen as the headquarters for that, with a large amount of dollars on the table. We might argue the merits of such an approach—is that the State subsidising the Federal Government?—but it gets back to what Professor Williams was saying before. Things such as Cooperative Research Centres put skin in the game, and contributing towards that certainly helps you to win those types of projects. I just put those two examples forward as the environment that New South Wales and the other states are operating in, where cash can be important.

The Hon. JOHN GRAHAM: I have a couple of questions that are rocket science! I want to pick up on the launch question that was raised earlier. We talked a bit about the potential for some of these launches to happen in Australia. Where have the satellites you have launched been launched from, to date?

Professor CAIRNS: They have been launched from the United States—Cape Canaveral.

Professor DEMPSTER: The same—all the eggs were in one basket. Four Australian satellites went up in one rocket. So if that blew up we were in real trouble. There were three on the QB50, and the Biarri was on there as well.

The Hon. JOHN GRAHAM: Earlier this year, New Zealand launched its first satellite—a commercial provider—off the North Island.

Professor DEMPSTER: It is down to that company that New Zealand has a space agency. The company forced the issue.

The Hon. JOHN GRAHAM: From the evidence you were giving earlier, one of our advantages is that we are closer to the equator. So the closer you are to the equator the bigger the payload advantage. You can send up—

Professor DEMPSTER: Centrifugal force—the spinning.

The Hon. JOHN GRAHAM: Yes. It is cheaper to send up the same sized payload—you need to spend less fuel to get there. How are the New Zealanders getting the jump on us, given how far south they are? What is going on?

Professor CAIRNS: It is not the only thing. Being near the equator is not the only thing that is relevant. Many people would prefer a relatively highly inclined orbit that goes to high latitudes in both the Northern Hemisphere and the Southern Hemispheres, rather than remaining near the equator. It really depends on what orbit you want; it is not a huge advantage.

Professor DEMPSTER: By that he means that there is a lot of water around New Zealand that it can fall into and not kill people.

The Hon. JOHN GRAHAM: Thanks for that clarification!

Professor DEMPSTER: You can point in lots of directions from New Zealand and not hit anything.

Professor CAIRNS: There is a question as to how important the launch is. For some people it is a commodity. I might argue that mostly it is a commodity. I can launch something from at least one company in the United States—United Launch Alliance. There is India and there is the European Space Agency [ESA] et cetera. The question is whether you can do it more cheaply from other groups. That is what Gilmour Space Technologies and perhaps Rocket Lab—although that is extremely expensive at the moment—can potentially provide: much cheaper access to low earth orbit.

The Hon. JOHN GRAHAM: Given the scale of increases in launches that you are talking about—I think you said it may be growing at 25 per cent per year—where does an Australian launch capacity fit in the list of priorities? Is it important at all or very important? Where does it—

Professor DEMPSTER: From a Government point of view?

The Hon. JOHN GRAHAM: From an industry development point of view.

Professor DEMPSTER: You would almost need to come back to Defence on that. There could be a sovereignty issue here.

The Hon. JOHN GRAHAM: Sure.

Professor DEMPSTER: If companies like Gilmour Space Technologies and Equatorial Launch Australia can make their business cases and launch their rockets, then they should just do it. I see that the opportunity is there and they are going to take it. No matter how you prioritise it, from the Government point of view, if it happens it happens. It is there. It is a capability that you can use.

Professor CAIRNS: I guess the way I would put it is that sovereignty is one important issue, but otherwise, if you can hire it from five different overseas groups, and get into space with the same timing and the same cost, then you do not have to do it in Australia. It is more about resource usage.

Mr HARVEY: I guess the question of sovereignty is: is it the launch pad, which fires a missile brought in from somebody else, or do you want to go all the way down the supply chain and be able to develop the booster from first principles? Which is the sovereign bit that you want in all of that?

Professor DEMPSTER: Both of those things have been developed. Equatorial Launch is doing the space port, and Gilmour is doing the rockets. So different people are doing different parts of that.

Professor CAIRNS: In some sense, getting too far into the launch game, unless you have totally new angles—hypersonic launch, for instance—it is not Space 2.0. You are going back to hundreds of billions of dollars worth of infrastructure.

The Hon. JOHN GRAHAM: I have a question for the Acting Chief Scientist. If the Committee was to recommend that, given the evidence we have had today that New South Wales really is the leading jurisdiction, we might, in a systematic way, ask for some advice about the opportunities—looking at New South Wales research institutions and our existing capabilities. Is that the sort of thing that you have provided advice on in the past, or might be able to provide?

Dr ARMSTRONG: That is something that we can provide advice on. We have looked across a number of related fields that I mentioned before.

Professor DEMPSTER: Before asking for that, I would read the submission from the NSW Department of Industry to the expert panel, because it has covered off a lot of this.

The Hon. JOHN GRAHAM: Yes, good.

Dr ARMSTRONG: In terms of an innovation ecosystem around defence and space, another element that I did not mention before, which is also an enabler, is the Sydney School of Entrepreneurship. We have talked a lot about science and research, and we have talked about industry, but a critical path is the link between research, the researchers, commercialisation and industry. So I think the Sydney School of Entrepreneurship, which is a partnership of all the State's universities and New South Wales TAFE, could be an opportunity in that, as well.

The Hon. JOHN GRAHAM: Just to pick up your point, Professor Dempster, do you think we would be better asking for advice on what the next steps might be, rather than the opportunities that might have—

Professor DEMPSTER: I think those sorts of questions on capability—

The Hon. JOHN GRAHAM: They might have been covered off?

Professor DEMPSTER: Yes.

The Hon. JOHN GRAHAM: And it is really about what the next steps are. That is the sort of thing we might ask for.

Professor DEMPSTER: Yes, where are the future opportunities? I think that is the right sort of question.

The Hon. JOHN GRAHAM: Thank you for that guidance. While we have the two teams in the room, I was interested in asking this. If the view of the Committee was that this is an opportunity sitting alongside the defence opportunity—smaller but growing very rapidly; in fact growing more rapidly than in the past and certainly more rapidly than I had realised—where is the capability in the Government to take those next steps? Is that something that you see as sitting alongside the defence work that you are doing, or would it be more appropriately led—given that it is largely a research strength—in the Chief Scientist's area?

Mr SCOTT: Departmentally there is work within the Department of Industry on developing a number of sector strategies, so we have the defence and industry strategy. One of those others is an aerospace and space strategy. For example, the Defence NSW team has been contributing to that; it has been developed in consultation with industry and academia and we expect that it will be released towards the middle of the year—it is at draft stage now. We would see that elements of the Department of Industry would have the lead for the execution of that strategy as Defence NSW has the lead in the defence and industry strategy. So that work is underway now.

Professor DEMPSTER: And one piece of advice I would give is if you could treat aerospace and space separately in that strategy it would be very useful, so that space does not get lost. Also, I think the precinct which has been proposed at the airport probably would not be that helpful to the space grouping, which is more, unfortunately, eastern suburbs in a more expensive real estate area. But that is where all the action is at the moment and all the start-ups are in sort of Chippendale and in that district as well.

Dr ARMSTRONG: Can I just mention two things? Some of the other universities in the State also have space, but I will not argue with the professor—Western Sydney University, for instance, and Macquarie University. I mentioned the two sets of work that the office of the Chief Scientist rolled out. Part of our function sits within the same department as Defence NSW, within the industry department. I might not have made that clear when I started.

Professor CAIRNS: Can I add just one tiny thing there? I would argue that space research goes across New South Wales; it is not just an eastern suburbs affectation. But, instead, you have got people at the University of Newcastle and Wollongong as well as Macquarie and UTS and so on. It really is something that is richer.

Mr SCOTT: Chair, I have some advice in relation to one of the questions from this morning which I can offer the Committee. The question on notice was in regards to the relevant strengths of the departmental organisations in various States. Just by way of comparison, and because it relates to some of the commentary, if I could offer the structure of the South Australian organisation? Defence SA has an executive team of three: a chief executive and two executive directors. They are supported by four directors. Interestingly, they have an aerospace, a maritime, a land and a space director and underneath those seven executives they have 20 staff. At a government level, the Premier, Steven Marshall, is the South Australian Minister for Defence Industries; their Defence Advocate is Vice Admiral Russ Crane, who is a former Chief of Navy; they have a board which is headed by Air Chief Marshal Houston and eight distinguished persons. That is the construct of Defence SA, which is the largest of the constructs across the State. A point I would make is that each of the organisations has grown up in different environments at different times and will have different charters, roles and responsibilities.

Professor DEMPSTER: Do you know if the new South Australian Government has a space Minister?

Mr SCOTT: I do not.

Professor DEMPSTER: Because the old one did.

Mr SCOTT: I am not sure. I hope that satisfies the Committee's question.

The CHAIR: Thank you, Commodore. I thank you all for making yourselves available today and participating. The Committee has resolved that answers to questions taken on notice will be returned within 21 days. The secretariat are more than happy to contact you and liaise with you to provide those to Committee members.

(The witnesses withdrew)

(The Committee adjourned at 15:19)