

**ECONOMICS AND INDUSTRY
STANDING COMMITTEE**

**INQUIRY INTO TECHNOLOGICAL AND SERVICE INNOVATION
IN WESTERN AUSTRALIA**

**TRANSCRIPT OF EVIDENCE
TAKEN AT PERTH
THURSDAY, 11 FEBRUARY 2016**

SESSION ONE

Members

**Mr I.C. Blayney(Chair)
Mr F.M. Logan (Deputy Chair)
Mr P.C. Tinley
Mr J. Norberger
Mr T.K. Waldron**

Hearing commenced at 9.31 am**Professor SVEND PETER KLINKEN****Chief Scientist, Office of Science, Department of the Premier and Cabinet, examined:**

The CHAIR: Good morning, and thank you, Professor Klinken, for coming along. On behalf of the Economics and Industry Standing Committee, I would like to thank you for your appearance before us here today. This meeting is being convened to enable the committee to gather evidence for its inquiry into technological and service innovation in Western Australia. You have been provided with a copy of the committee's terms of reference. At this stage I would like to introduce myself and the other members of the committee present today. I am the chairman, Ian Blayney, the member for Geraldton. With us is Hon Terry Waldron, the member for Wagin, and Peter Tinley, the member for Willagee. The Economics and Industry Standing Committee is a committee of the Legislative Assembly of the Parliament of Western Australia. This hearing is a formal procedure of Parliament and therefore commands the same respect given to proceedings in the house itself. Even though the committee is not asking witnesses to provide evidence on oath or affirmation, it is important that you understand that any deliberate misleading of the committee may be regarded as contempt of Parliament. This is a public hearing. Hansard will make a transcript of proceedings for the public record. If you refer to any documents during your evidence, it would assist Hansard if you could provide the full title for the record. I just welcome the deputy chair, Hon Fran Logan.

Before we proceed to the specific questions we have for you today, I would like to ask you the following. Have you completed the "Details of Witness" form?

Prof. Klinken: Yes, I have.

The CHAIR: Do you understand the notes at the bottom of the form about giving evidence to a parliamentary committee?

Prof. Klinken: Yes.

The CHAIR: Did you receive and read the information for witnesses briefing sheet provided with the "Details of Witness" form?

Prof. Klinken: Yes, I did.

The CHAIR: Do you have any questions in relation to being a witness at today's hearing?

Prof. Klinken: None at all.

The CHAIR: We have some questions for you, but before we get to them, would you like to make an opening statement?

Prof. Klinken: Thank you, chairman. In all of my public presentations, I acknowledge the traditional owners of the land in their language and I request your permission to do so, noting that you have spoken in Wajarri to the Parliament of Western Australia, which I think is terrific.

The CHAIR: Nhurra barndi, or good morning. Please, go ahead.

Prof. Klinken: Kaya mooditch briddia marmum. Nyun djurapin nidja yeti. Nidja Wadjak Noongar boodja, Derbal Yerrigan. Nyun katitj Noongar briddia marmun briddia yorga kura kura wer yeyi.

Good morning, important men. I am very happy to be here. This is the land of the Noongar people, particularly the Wadjak people who live around this area they call the Derbal Yerrigan. I acknowledge the elders, past and present.

The CHAIR: Thank you. Very good.

Prof. Klinken: I hope Hansard was able to get that—unusual translation!

The CHAIR: Perhaps if you provide it in writing.

Prof. Klinken: We can do that later.

Thank you very much for this opportunity to be here before this very important committee. I would like to draw the committee's attention to a couple of documents. The first one is the UK Treasury's "Our plan for growth: science and innovation". It is a 10-year plan that provides a very, very clear direction as to where the UK is going in this area. I think there is a lot we can learn from that. Another one is Singapore's "STEP 2015: Science, Technology & Enterprise Plan 2015"—another really worthwhile document. I would remind the committee of some information that has been provided by the Western Australian Parliament. This is a document from the Select Committee on Science and Technology entitled "Final Report", dated November 1994.

The CHAIR: We are still getting around to that one!

Prof. Klinken: Signed off by none other than Kim Hames and Eric Ripper—famous names. Had we implemented half of the recommendations that were in here, we would not be meeting today. I would strongly recommend we go back and have a squiz at it because 21 years ago there was a committee that reported on precisely the topics that we are discussing today. I think it was actually a visionary document, looking back on it now.

If I could then move to a couple of points that I would like to make, first of all by comparing Perth to a couple of cities that I visited recently, primarily Oxford and Cambridge, and San Diego. Oxford and Cambridge are small cities of about 150 000 people. Twenty-five years ago they were described as market cities with very large universities next door. They are now considered high-tech hubs where, in each of those cities, there are between 50 000 and 60 000 high-tech jobs and 1 500 high-tech companies. In the space of a single generation, they have gone from a market village with a big university to centres of massive high-tech industries. San Diego, similarly, a generation ago, was a place where wealthy Americans went to retire and was the home of the 7th Fleet. It is now the third biggest biotechnology hub in the world. I have explored these places to see what lessons we can get for WA. Is it okay if I provide you with some of those salient points that I have picked up?

First of all, in each of those cases, science parks and technology clusters around universities were created around these centres of excellence. Universities were encouraged to develop an entrepreneurial attitude. There was a mix of top-down ideas and a bottom-up approach from bright people who actually were entrepreneurial. There was a mix of what they called hard infrastructure, which is physical things like accelerators, incubators, science parks, but also what they called a soft infrastructure, which is valuing entrepreneurship and providing support services like IT, legal, accounting and so on. They felt those soft infrastructure were equally important as the hard, physical infrastructure. Finance was critical. It is what they call smart money where you had angel investors—venture capital people who understood the new technologies and were prepared to take a punt and then became what they call serial entrepreneurs. They were successful and they reinvested in the area, which spawned these new industries. One of the key elements in all of these was to have a large anchor tenant—to bring in a large corporation, if you can, that provides credibility and status, and then you start seeing smaller groups developing around them. But incentives were essential to attract these large corporations. Importantly, in all three areas, quality of life was really important for the ability to recruit talented people. Pleasant surroundings, affordable housing, transport, tolerance and education were key elements in this. They then actively went out and celebrated and publicised successful companies and highlighted successful entrepreneurs. For example, in Cambridge, Hermann Hauser has become a household name because he was the first entrepreneur who was successful, reinvested, and it just became part of the culture

for the city. Developing networks was really important, exchanging information at functions, and they engaged facilitators—people to work between industry and academia; people who understood industry but also understood academia and moved backwards and forwards between the two to enable greater information flow. They also ask industry to identify their needs and then they would use these facilitators to identify the academics who could assist industry in addressing their real world needs.

I think Western Australia is really well positioned. We have got the fundamentals in place. We need to put a few of these building blocks into place in a better way. My thoughts are that in WA we have bright people who come up with bright ideas—as simple as that. How do you recruit them? You have to have an environment that recruits bright people and we also have to make sure we retain them because talented people will go to an environment where they are going to be successful. If we do not provide an environment, we will lose them. The physical environment is crucial—the buildings, equipment and facilities. What I call the emotional environment is really critical where we encourage risk-taking support people, provide supportive commentary that says this is an area that we value. It is amazing the uplift that has happened in the last few months when there has been a change of Prime Minister. The whole word “innovation” now is a buzzword. You cannot go anywhere without hearing it. I have just sensed a positive lift that I cannot recall for many, many decades.

The financial environment has to be improved. Local investors in Western Australia are very comfortable understanding risk when it pertains to resources, minerals, oil and gas; they have a real problem understanding the risk associated with other areas—IT, life sciences and so on. There is an education process that needs to happen in that regard. It is not like our venture capitalists and angel investors here are not risk-takers; it is just they do not understand those new areas, in my view. I think there is a real opportunity in Western Australia to improve our coordination between various sectors, and that includes government with industry, government with academia, and industry and academia. We are all in this together. We all need to work together as well. I believe there needs to be a common science and innovation narrative for Western Australia. Instead of every man and his dog going off and saying their particular bit, we need to have a very clear narrative that explains what Western Australia is all about.

Collaboration is crucial. We are too small to spend our time fighting amongst ourselves. The competition is global, not local. We need to take a “team WA” approach. We need to provide some incentives to recruit some big corporations here, and it is not inconceivable. Have a look—we have Shell and Chevron in our backyard. We can do it. To be attractive, we have got a fantastic natural environment. Our built environment is approaching world-class, quality of life is unsurpassed, we have a very tolerant society and we have a very creative environment. I believe we have all the ingredients in place to make Perth a set of creativity and innovation. I would just love to see that happen in the next few years.

On that note, I will stop and be very happy to take any questions. Thank you, chair.

Mr F.M. LOGAN: Thank you very much, Peter, for the introductory statement. You explained everything in a nutshell!

Prof. Klinken: That is very kind of you.

Mr P.C. TINLEY: We can shut it down right now!

Mr F.M. LOGAN: That is it; we are done!

I will not go through the details of what you just explained in the first instance, but I do want to come back to the issue of incentives for those tech parks. It is funny that you related back to that report. You could go back even earlier and look at the Bentley Technology Park, which was really one of the very first technology parks in the world, established here in Western Australia, with very innovative legislation around it. It is fantastic. It has only partially worked. WAIT has become

a university. There are a number of companies out there. There are buildings around a hub. CSIRO has now invested into it, which is good, but it has not taken off as other tech parks around the world have taken off. That is probably a classic case for examination as to why, but I think one of the reasons is different policies from different governments, but also incentives.

[9.45 am]

We never really did get a major organisation to locate there, apart from maybe CSIRO, but it is a government body. We never got a major corporate to locate there, and there has always been this push-pull between Treasury and whoever is the minister at the time as to whether incentives be offered for that purpose. Did you get any indication of what those incentives were?

Prof. Klinken: I got a very strong indication, particularly in Cambridge, where they built a science park and it was dormant for a very long time. It was seen as a white elephant, to be honest, until they managed to get a serious anchor tenant, and that required—in that case the government was not involved because it was a private deal. It was one of the colleges at Cambridge—I think it was either St John's or Trinity College—that built this park, and they went out and negotiated directly with a big company to relocate to Cambridge. Since then I have discovered that this is a fairly standard approach: that if you bring a big anchor tenant in, the smaller ones tend to feel very comfortable coming in around them. The question of incentives can be any number of factors. It could be just getting land cheap. You go back to what I call the WIIFM principle—what's in it for me? How do you get someone to relocate to the most isolated city in the world here in Perth? There has got to be an incentive for them; there has got to be something in it for them. That has to be thought through very carefully. It can be financial; it can be space. There are any number of things, Fran. I think it needs to be done almost on a case-by-case basis, but you need to target the corporation that you are planning to go to, really do your homework on them, and work out what is in it for them and then make them an offer. I am going to Singapore next week. If you look at Singapore, they have been incredibly successful in attracting a whole bunch of big pharmaceutical companies to Singapore, and I cannot wait to find out what they actually offered those companies to relocate to Singapore—at least partially relocate to Singapore.

Mr F.M. LOGAN: Thanks.

Prof. Klinken: Does that answer your question?

Mr F.M. LOGAN: It does, and I will chat with you when you come back.

Prof. Klinken: I look forward to it.

Mr P.C. TINLEY: The key thing for me is trying to understand where government's role exists. More often than not it circles around resources and chequebooks, and that is not necessarily the answer. I will be very keen to hear your thoughts on where money makes a difference and the other sorts of support that government can give as an actor in the network of science.

Prof. Klinken: Once again, Peter, I think it depends on the circumstances. If you have a very strong financial sector that is prepared to take risks and to take a punt, you do not need to go and play in that space. Government does not need to go actively into that space. If the financial sector is not doing that stuff, then perhaps government can play a role there. It depends on the circumstances. We go back to tech park for example. I think the fundamentals are in place to have a very successful technology park there; it just needs to have a bit of revitalisation, a bit of reorganisation, and a bit of energy. Dare I say it, if it was to go to the ED department of Charlies, you would want to get out the paddles and really jolt it back into life. The body and the fundamentals are there: you have got a good university, you have got CSIRO and you have got the Pawsey supercomputer right next door, and that should be a really humming place.

Mr P.C. TINLEY: Yet it is not, and in spite of the multimillion-dollar spend at Pawsey, Curtin and DAFWA going in there now, it does not seem to have that private sector engagement.

Prof. Klinken: Going back to Cambridge once again, their first science park was fallow for a long time, and they now have three science parks. So it needs a critical mass, and I think getting a key anchor tenant out there would be really important as well. I was out there opening a small chemistry company—new facilities—on Tuesday called Epichem. I just love the story about Epichem—a little, dare I say, dinky, small-to-medium enterprise has grown out of Western Australia, with 18 employees, 13 of whom have PhDs in chemistry. They export 90 per cent of their business across the world. Those are the sort of success stories I would love to hear more about. We should be celebrating them. Nobody knows about Epichem, but if Dow Chemical were to move in there, everyone would suddenly say, “Hang on a second, what’s going on here? Epichem is next door to Dow Chemical.” That would start to develop a different conversation.

Mr P.C. TINLEY: In terms of the hard numbers, in dollar terms—and being the chief cheerleader of all that is smart in the state—do you have in your office a handle on what the total science spend is across government?

Prof. Klinken: Personally, no, I do not. The interesting thing there is that each government agency spends money on R&D and it is really hard to sometimes tease up what is R&D and what is part of operations and so on. To be honest, I do not have a handle on that. Having said that, I think government plays a critical role—a critical role—in the applied R&D space. It cannot walk away from that; otherwise, the state is at risk. I believe the universities’ research organisations play in what I call the one-to-three space the very early fundamental science that needs to move into applied science and monitoring and so on, and then it goes into industrial scale and practical outcome. If you take that central bit out, you disaggregate that chain, there is a break, and therefore you do not go from the bright ideas to final practical outcomes.

Mr P.C. TINLEY: The reason I ask is because you talked about the requirement for a central narrative, plan or strategy, whichever way you want to describe it, or if there is a vicarious spend, if you like, through the other agencies and/or a tension of those the agencies in their R&D and the applied side of it, how do you think a narrative or strategy would help them or shape them to make sure? My point is: are we getting the best bang for our buck, because nobody can measure it? If nobody knows what we spend on R&D and nobody knows what the government’s role is in this space, how can we possibly measure it and then quantify the size of it?

Prof. Klinken: Those are very important issues. If you are looking at measures that are used in the academic world, it is primarily publications. The number of publications and the quality of those publications, which then attracts grants, which then creates jobs, which then creates papers, and you have a circle there. It is easy to measure for the academic world. You cannot use those metrics in the applied world because it is not about publications; it is about taking the bright ideas and moving them towards practical or commercial outcome.

I give two examples of where it is really important for government agencies and the role they play in our society. The first one is Fisheries. If Fisheries do not conduct their monitoring of crayfish pueruli, we have a crayfish industry that is at threat. It is now our crayfish industry has been given the maritime stewardship certificate—I think that is what it is called, the MSC—because it is a sustainable industry. Had Fisheries not done that homework, I would hate to think where the crayfish industry would be now.

Similarly, I would go to the Geological Survey, which has been funded by this state for 120 years. Long-term science has mapped out Western Australia. As a consequence, we have probably the most efficient and the best resources sector in the world—all based on solid science that is been supported by the state government. Now, you take those away, and those industries then are at risk. So I totally agree with you that there has to be a mechanism that explains the work that is being done, values the work that is being done, and measures the work that is being done. So I think there is a job in government to make sure that every agency that is associated with R&D is involved in that.

Mr T.K. WALDRON: Following from that and about government's involvement, you seem pretty excited about Cambridge and Oxford and what is happening there. When we were in Queensland, they had a Smart State program. Are you aware of that Smart State program?

Prof. Klinken: Yes; absolutely.

Mr T.K. WALDRON: That seemed impressive to me. Do you think that is something that we should follow and is that a little in line with what they are doing in Cambridge and Oxford?

Prof. Klinken: Absolutely. I think when Peter Beattie, when he came in, transformed Queensland. I have had the pleasure of talking to him about it and asking him how he changed the narrative. He said to me, "I was a lawyer; I knew nothing about biotechnology, but when we were in opposition, we looked at where the industries were in Queensland and where was the future." Essentially, Queensland was a primary industry-driven economy, and they saw the future as being part of biotechnology and life sciences, so when they came into the government they made a clear decision that that was something that they were going to invest in. Two things to say: one, they came up with a narrative which said Smart State. It was a very clear, very precise statement that said, "This is where we are going." Previously Queensland was considered a bit of a redneck, primary-producing economy. They said, "No, we're now the smart state." Secondly, they put dollars in and invested heavily. I can tell you that there was an exodus of scientists from the south east of Australia into Queensland as a consequence of that.

Mr T.K. WALDRON: That is in line with what you were saying about the lifestyle being really important. They made sure they got the best people by providing that.

Prof. Klinken: Absolutely. So once again you come back to what are the incentives of what is in it for me: If I am a really bright scientist in Melbourne and I do not like the cold weather, I would rather go to Queensland, but I need to know that my job is going to be successful. I can continue to be a successful researcher where I am, so the environment has to be right, the buildings have to be there, all the equipment has to be there and it is a supportive environment. It is a complete package.

Mr T.K. WALDRON: It was pretty impressive.

Prof. Klinken: It is.

Mr T.K. WALDRON: If we were to go down that line or something like that line, at the moment we have the Premier who is also the Minister for Science as well, do you think it would be advisable to have one minister looking after all that? Does that add that focus and importance to a government and help?

Prof. Klinken: I think it would make life a lot easier, to be honest, if there was a central individual through which this was all driven.

The CHAIR: In 2015 we released a science statement for Western Australia and it set out our priorities for research: mining and energy, medicine and health, agriculture and food, biodiversity and marine science, and radioastronomy. How do these things impact on the allocation of funding for research in Western Australia? I suppose the other thing is: Do you think doing that automatically—just an observation—that when governments go picking champions, quite often they get it horribly wrong. I remember the Japanese government advised Honda not to build cars and Canon not to build cameras or something. It is obvious that both those companies do those jobs quite well. Do you think that is a good thing or do you think maybe number six has to be "anything else"?

Prof. Klinken: I would have a category X, which is something that is going to come over the horizon that we do not actually know yet, but we need to have our antennae up, dare I say it, to see what is the next big opportunity we can grab hold of. I love using the SKA as an example. We have had a long tradition in Western Australia of being very good in mining, energy, agriculture, medical research. I love the SKA because it is what I call the "VIP approach". Someone had a vision.

There was investment and there was planning, and 10 years ago there was not a radio astronomer in Western Australia. We now have 130 radio astronomers in WA. You have got there a supercomputer—a 1.5 petaFLOPS supercomputer here at the Pawsey centre which in five years is going to be a 100 petaFLOPS supercomputer, which will be double the biggest supercomputer in the world. At the moment that is 50 petaFLOPS, so ours in five years' time will 100 petaFLOPS—and at stage 2 of phase 2 at the SKA, it is thought to go to 1 000 petaFLOPS, which is—it is called “exascale”; it is just mind-boggling.

[10.00 am]

So, out of that provides opportunities in supercomputing, data analytics, data linkage that this state is just gifted. We have this wonderful facility, not just for the SKA and radio astronomy, but other people can use it, and the spin-offs will just be enormous. I do not think anyone would have predicted when SKA was being discussed 10 to 15 years ago that these would be some of the potential spin-offs but, you know, vision, investment and planning have just made a huge difference. To address your question: are there opportunities in the future? Yes. We need to be very sharp, we need to be agile and we need to be able to make decisions that will say, “We’ll take a punt and do it.” Having said that, there will be some that will go down the gurgler, and I think we need to accept that we cannot ever get to a situation where we are going to be 100 per cent perfect in making our decisions. Life is not like that. If you are getting a 100 per cent success rate, then you are not taking enough risks.

Mr F.M. LOGAN: Peter, just on that, as you know, in a previous life of mine, both of us discussed the issue of supercomputing in Western Australia and the leverage we can get off the SKA supercomputer. Whilst saying that seems fairly easy, doing it is something far more tricky and, as this committee has discovered, it comes down to the relationship between government institutions and everyone else—not just the private sector, but everyone else outside of it. For example, there is CSIRO. Of course, they now have a new CEO, who is reshaping and revamping CSIRO, and that might change things. But we went to the Centre for Advanced Materials Manufacturing in Victoria, which was a fascinating place, particularly their use of titanium 3D printing, for example. We produce a lot of titanium in WA.

Prof. Klinken: We certainly do.

Mr F.M. LOGAN: There should be a very strong link between that and what we do in terms of downstream processing. They admitted it themselves. They said to us, “Our links between this facility and CSIRO and the site and business is appalling, and it has been for a long time.” They were taking steps to overcome that—to put feelers out there to try to get people to be aware of what they have got. Do you not see that problem here? If you went out there into the voter land of WA and asked people about the Pawsey supercomputer, they would not have a clue what you are talking about. That is here in Western Australia, let alone around the rest of the world—people do not know that it is here. It is a great tool. It is a great facility. It is also in the hands of a government organisation—like the other CSIRO facilities out there, some of which have got very, very good business links and private sector links, particularly in the oil and gas sector. It is difficult to get them to change their internal culture to match the objectives of a government. If the government is going out there trying to attract businesses to co-locate around the benefits of a supercomputer, for example, and you have got an organisation that is not that willing to talk to people outside, where does the marry-up come and what benefit is there to the companies who are investing?

Prof. Klinken: To me that comes down to leadership and actually saying, “This is what we expect of you.” Who is paying for the supercomputer? Who are the investors in the supercomputer? Well, essentially it is Joe Public because it is taxpayers’ dollars. I believe that taxpayers have every right to make sure that that facility is being used for the best benefit for the community. It then requires the representatives of the public to ensure that facilities like that are being used optimally

and they cannot just go off and do their mental gymnastics and be very esoteric if it is not actually doing the stuff that can benefit the community in other ways.

The example that I would draw there, Fran, is the CRC program—the cooperative research program. I have reviewed several CRCs, and I will be honest with you—the vast majority of them were hijacked by academics; they saw that as a pot of money to go off and do academic stuff and get their papers out, instead of the real purpose being to take those ideas and translate them into industry and practical outcomes. Who was asleep at the wheel, not making sure that that happened? Obviously, the people who actually put in place the schemes were not making sure that the funds were used as the scheme was decided. It is all very well that the money was used to generate new knowledge and more papers—it is great for Australia's prestige as a knowledge nation—but it actually failed in what it set out to do, which was to create more industries and so on. I think there is a really important role in terms of making sure that the money is used appropriately, and that is an active job of work. You cannot just assume it is going to happen.

Mr T.K. WALDRON: My question follows on a bit from Fran's. One of your themes is for greater collaboration between industry and research et cetera, and most people you talk to talk about that.

Prof. Klinken: Except academics, if I can be so rude; they are very comfortable in their own little world.

Mr T.K. WALDRON: You said that we are too small to be fighting against each other. It is easy to talk about that and in a lot of our submissions everyone talks about that, but what could we really do to make that actually happen?

Prof. Klinken: There is any number of things. First of all, just make a very, very clear, loud statement: "This is what we expect." In future, we will be providing funds for various initiatives and we will consider those based on how well you guys have been playing in the sandpit up until now. If you have not been nice kids playing happily in the sandpit, you are not going to get your money. That is one thing that you could consider. Two, you could actually put in place facilitators like they do in all of northern Europe; that is, actually hire people to go between industry and academia, and even between government and academia.

Mr T.K. WALDRON: We have to get real about it.

Prof. Klinken: Absolutely. At one level it is really good having rhetoric, but at another level it is what I call, "i to i"—ideas to implementation. Ideas are cool and you can get out and talk about them, but the rubber has got to hit the road, and you have to implement them. You have to take active steps to make things happen. It is a bit like a marriage: it does not just happen; you have to work at it—sorry, scratch that one for me!

Mr T. K. WALDRON: Would you do that along with incentives as well?

Prof. Klinken: Absolutely. I think it has to be a total package. What are the various things that we need specific for our Western Australian conditions? We have got a whole bunch of things that are in place already. We need to take advantage of what we have got and fill in the gaps where we do not have stuff. For example, we do not have a life sciences incubator. There is nowhere for some bright spark at any one of the universities who works in a laboratory to take that idea and test it out in an entrepreneurial setting. It has to be done within an academic setting, which is a totally different environment, because all they want to do is publish papers; they are not interested in setting up a start-up company that becomes an SME and so on. There is a physical bit of infrastructure that is missing. So there are bits of the jigsaw puzzle that need to be put together—not that hard if we actually get our act together.

Mr P.C. TINLEY: I want to talk about employment. Those who read into this know that there is a massive shift in the nature of employment and a massive shift in the skills spectrum. The national Chief Scientist and yourself have said that as much as 40 per cent of the current jobs will not exist by 2025 or thereabouts, into the future—it does not really matter—which for any government

should get a big red flag going in front of them, because there is nothing more important, particularly for a state government, than employment and appropriate-skilled employment. That leads a lot of thinking. The Prime Minister has been an advocate of this and others are, and you have been saying that it is not about citation, but about implementation or, as they say, industry facing research and industry facing application. That will invariably lead people down the tech start-up route, but when you actually look at the numbers and look at the potential for employment, whilst it is a very important place, it seems to me the most likely people to employ more Western Australians are those currently employing Western Australians. Are you aware of or do you have a commentary around our SMEs and their capacity and fitness and willingness to undertake innovation and engage with research and development?

[10.10 am]

Prof. Klinken: Good question. My experience with the SME sector is that it is very inward focused and very comfortable working in a local environment, instead of thinking globally. So you are thinking small immediately. You are not thinking of playing on the world stage, and therefore you do not need to interact with people who can provide you with the bright ideas that give you that next edge that takes you globally. I think our SME sector—it is not just a Western Australian thing, I think it is actually across the country—really needs to become much more international in their thinking and open their minds up, and that will create new opportunities. If you look at the stats, Australia ranks last in the OECD in terms of SMEs interacting with academic institutions. That is not one we should be proud of. It is a terrible indictment on where we have got to.

In a way, I can understand where SMEs are coming from. They are small, they are trying to build a business and they feel intimidated, awkward, uncomfortable dealing with dirty great big bureaucracies like universities who talk to people who have titles called professor and who are supposed to be incredibly smart. There should be much easier ways to navigate through universities, and I think it is incumbent upon universities to actually make it easier for those interactions to take place. We need to have messages that go out to SMEs saying, “You know what? It is important that you innovate. It is really important that you find the right people, and we can provide you with facilitators, like the UK, Denmark, Holland and Germany do, to find the right academic for you. If you have a problem here, we might be able to find someone who can assist you, and then that will grow your business.” In regard to job growth, it is really interesting if you look at the Kauffman Foundation in the US—they did a couple of studies, one of them came out in 2011—they said that the biggest growth in jobs in the US over the previous two decades came from companies that were less than five years old. Interesting. That is growth—right? You have big companies, the big pharmaceutical and chemical companies, that are not actually growing. The growth is actually at a smaller level, where you are employing half a dozen people. That is where the growth was coming from, certainly in the US. So it is not a sector that we want to dismiss at all. We really want to encourage those people to be more innovative and more creative, but we need to put mechanisms in place to make it easier for them.

Mr P.C. TINLEY: So is it fair to say there is a capacity gap within industry, within the sector, and a capacity gap within research and development—so all the technology end of it?

Prof. Klinken: Correct. You know, to be honest, within the academic world, for a long, long time it has been seen as an anathema that you go and actually sully yourself to talk to industry. You are not out there publishing this fantastic new article, because you are actually talking to industry. That is just unacceptable. It is great that you publish—absolutely fantastic. Australia becomes a knowledge nation and higher education is our fourth biggest money earner, but we also do need to make sure that we are generating new jobs because 60 per cent of Australian PhD graduates go into academia. If you go to North America or Europe, 60 to 70 per cent of people with PhDs go into industry because there are jobs there, and that is where the bright people end up. Now, our academic scene in Australia is capped. We have had massive growth in the sixties, seventies, eighties, and even into

the nineties. That is not going to happen anymore. Where will all those bright people go? They cannot go to academia and they cannot see that there are jobs available in Australia.

Mr T.K. WALDRON: They go overseas.

Prof. Klinken: Absolutely; they are mobile. It is part of what they call the creative class. The creative class that Richard Florida talks about is very, very mobile, and they all go where the jobs are for them. We have to ensure that the opportunities are here in WA because, gee whiz, we have everything in place, we just have to make it take off.

The CHAIR: That is a very good point at which to, unfortunately, draw to a close, before you take off.

Thank you for your evidence before the committee today. A transcript of this hearing will be forwarded to you for correction of minor errors. Any such corrections must be made and the transcript returned within 10 days from the date of the letter attached to the transcript. If the transcript is not returned within this period, it will be deemed to be correct. New material cannot be added by these corrections and the sense of your evidence cannot be altered. Should you wish to provide additional information or elaborate on particular points, please include a supplementary submission to the committee's consideration when you return your corrected transcript of evidence.

Thank you very much for your evidence. I suspect the committee will be coming back to you with some more questions. Are you okay to answer those?

Prof. Klinken: I would be honoured to do so. I do apologise for getting up on my soapbox and being a bit passionate; I cannot help it. It is too important for this state.

Hearing concluded at 10.15 am
