ECONOMICS AND INDUSTRY STANDING COMMITTEE

INQUIRY INTO TECHNOLOGICAL AND SERVICE INNOVATION IN WESTERN AUSTRALIA

TRANSCRIPT OF EVIDENCE
TAKEN AT PERTH
TUESDAY, 19 APRIL 2016

SESSION TWO

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 10.15 am

Dr ALEXANDER WONHAS
Executive Director, Energy, Environment and Resources, Commonwealth Scientific and Industrial Research Organisation, examined:

The CHAIR: Good morning and welcome. On behalf of the Economics and Industry Standing Committee, I would like to thank you for your appearance before us here today. The purpose of this hearing is to assist the committee in gathering 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 point, I would like to introduce myself and the other members of the committee here today. I am the chair, Ian Blayney. With me is the deputy chair, Hon Fran Logan, and committee members Hon Terry Waldron and Peter Tinley. 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 the Parliament and therefore commands the same respect as 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 you understand that any deliberate misleading of the committee may be regarded as a contempt of Parliament. This is a public hearing and Hansard is making a transcript of the proceedings for the public record. If you refer to any documents during your evidence, it would assist Hansard if you would provide the full title for the record.

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

Dr Wonhas: I have.

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

Dr Wonhas: I do.

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

Dr Wonhas: I have.

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

Dr Wonhas: Not at this moment, chair, thank you.

The CHAIR: Can you please explain the capacity in which you appear before the committee today?

Dr Wonhas: I am the executive director for environment, energy and resources at CSIRO. I also have responsibility for Western Australia within CSIRO.

The CHAIR: Thank you. Before we ask any questions, do you have an opening statement?

Dr Wonhas: I do not.

Mr F.M. LOGAN: Can you provide us with an overview of the functions and the work of the National Resource Sciences Precinct that you referred to in your submission?

Dr Wonhas: Yes, I would be delighted to. Maybe as a quick starting point, the precinct is actually a key element of CSIRO's strategy. What we are trying to do is really bring together key research activities not only within CSIRO, which is obviously only one part of the whole innovation system,

but also work with key partners in the university sector together with industry partners. For us in Western Australia, that has actually built upon a very strong collaborative relationship with both the university sector and the industry sector that probably started with the Western Australian Energy Research Alliance—WA:ERA—which has been very successful in operation. That really led to the formation of the National Resource Sciences Precinct that effectively extended the scope of WA:ERA from energy to more broadly the resources sector. It has also given us a vehicle amongst the players within the innovation system to coordinate their capability investment both in terms of people but also in terms of infrastructure, which is, we believe, one of the key ingredients for a successful innovation system.

[10.20 am]

Mr F.M. LOGAN: Thanks for that answer. Can you answer me this, Alex: looking at that type of project from the outside, how could a taxpayer then differentiate between the work of the CSIRO and those universities that is no more than assisting current industry players, and subsidised current industry players, to become more efficient at what they do, as opposed to contributing to genuine breakthroughs and innovative breakthroughs that might lead to new companies establishing and diversification in the economy? How could you explain that to an ordinary mortal?

Dr Wonhas: I think we are all mere mortals! I think we actually need both. We need incremental innovation, but we also need breakthrough innovation. Incremental innovation is, I think, critical for a number of reasons. For example, in the resources sector, especially in the current environment, achieving productivity improvement and cost reductions is critical for its survival, and that is often in incremental steps. What it actually does when you are doing incremental work is that a couple of things happen. One is that, as a research organisation, you establish credibility with industry that you can add genuine value, and when you get into the higher risk, but also higher reward breakthrough innovation space, you actually need that credibility. It also helps researchers much better understand the needs of industry, and that is absolutely vital when we are talking about innovation because researchers generally are very good at solving problems, but we also need to help them identify what are the best and most important problems to solve. We are actually doing both. We are doing small incremental innovation—and I think we can go into more details—but we are also looking at some big breakthrough innovations that could, frankly, change the game also here in the state. Shall I give you an example of what something like this could look like?

Mr F.M. LOGAN: Yes.

Dr Wonhas: One area you have probably heard about is that there is a big electrification going on around the globe very much driven by and based on batteries. Those batteries need a lot of lithium, and Australia is very fortunate that it has some very large lithium resources, but it is actually spodumene, so it is a hard rock resource, which is not as easy to turn into lithium metal as maybe some of the deposits that you find, for example, in Chile in those salt lakes. So, here is a real opportunity for making a breakthrough in technology innovation, which is actually one of the things that we are working on. We are working on a mineral processing approach that is sufficiently low cost and sufficiently low energy that it actually makes that resource accessible and therefore puts really the resources that we have here in WA on the map. But it is a big step change for an industry that is probably a quite conventional and traditional mining industry, and it knows that very well but is probably nervous about going into processing and nervous about going into processing with a possibly unproven process.

Mr P.C. TINLEY: The precinct model: CSIRO by its nature has to have some sort of hierarchal structure and you are part of that, obviously, with your responsibility for Western Australia. We see this intention to create headquarters in different places, like manufacturing in Victoria and places like that. Do you think that is helpful, considering that, say, in any one particular sector there would be businesses throughout Australia that would be participants in it? How do we give them access? Are we cutting off our nose to spite our face?

Dr Wonhas: Look, it is a very good question and it is a difficult question to answer. I think you are right in saying that in the end we need an organisational structure and. as human beings, location matters. So what we have tried to do in our structure is try to identify where are the biggest concentrations of specific capabilities, where it then also makes sense for us to co-locate. When we are looking at WA, there is obviously a very strong focus on the energy and resources sector, so that is why we have a very strong focal point of our capability here. There is also a very strong focus on agriculture, given the exposure of the state to that. I think, given the length of the coastline, there is a lot of oceans opportunity, which is also why we are focusing here on oceans and maybe even aquaculture at some point in time. Certainly, we see a big opportunity in the future in the whole data space, also driven by the Square Kilometre Array, which is, I think, also quite a unique aspect of WA. You mentioned manufacturing. I think traditional manufacturing is probably not as strong in WA and that is why, for instance, our manufacturing activities are probably more focused over on the east coast. That said, that is also an area that we can go into. There are probably niche aspects of manufacturing that would be very relevant to those sectors where I think WA —

Mr P.C. TINLEY: So here is my question. Whilst we acknowledge that we do need these structures—they create silos of tribes—and the challenge for something like the CSIRO, which is a very old and established organisation, is to make sure that any decent idea in Victoria is translated and transmitted to the appropriate—so, for example, and this is about collaboration across different government programs, the five industry growth centres, which puts METS' headquarters in Queensland. Do you integrate with them, and where there is a good idea or an opportunity, how do we pollinate that and propagate it?

Dr Wonhas: I think you are absolutely right that that creation of silos, especially when we talk about innovation, is a barrier. We are working very hard in trying to overcome that barrier. As an organisation, I suspect that we are not doing too badly, so when we do work in WA, we typically do not worry too much where those capabilities are coming from across the nation, as long as it is the right set of capabilities, and we have a lot of internal mechanisms that help bring that deployment. You referred to the industry growth centres. We are actually involved in all of them and the role that we are trying to play is of a connector across the different growth centres. We have a lot of people who travel the Nullarbor divide frequently, and through exchange of people, basically provide that linkage.

Mr P.C. TINLEY: Is that formal or informal?

Dr Wonhas: I would have to check whether it is a very formal role that we have been given, but I can certainly tell you that internally within CSIRO we see this as a strong informal role that we should play, and obviously the growth centres are also attached to the federal department that we are working to.

Mr P.C. TINLEY: Formal or informal, what is your measurement of success?

Dr Wonhas: Of the growth centres?

Mr P.C. TINLEY: Of your business.

Dr Wonhas: Okay! It is a really good question and one that is very hotly debated. I think in the end we are measuring ourselves through the impact that we are generating, and that actually needs some careful collaboration for each of the areas we that are working in, what that impact actually is. Impact can be that we develop a new technology that leads to a cost reduction in industry and therefore underpins the long-term growth of that industry. Impact in maybe new industry areas can be that we have actually created a new business that previously did not exist and that business is successful.

Mr P.C. TINLEY: So, jobs growth?

Dr Wonhas: Yes, absolutely. I think at the highest level we are really looking for triple-bottom-line impact, which is jobs and economic growth, improved environmental performance and enhanced social outcomes.

Mr P.C. TINLEY: Are they stated, though, as success criteria?

[10.30 am]

Dr Wonhas: Yes.

Mr P.C. TINLEY: Are they binary? Is there a number to them?

Dr Wonhas: We are trying to quantify them often in economic terms, which I think is quite useful, but it is an imperfect science, especially when we are talking about environmental and social outcomes, which are much harder to quantify, but it is doable to do that.

One example I have just recently reviewed is the work that we have done for the Great Barrier Reef. You can obviously associate a healthier reef with increased tourism numbers and so there is a way to quantify that, but it relies on a lot of assumption. I still think it is important to do that because in the end we have a difficult job to do, as probably you have, looking at all the different things we can do. We need to identify what are the things that can deliver the biggest impact and benefit for the country, and having some form of quantification helps.

Mr F.M. LOGAN: Alex, can I just add on one of the issues that Peter has raised and that is the issue of location of resources by CSIRO, in our visits around the country as a committee to various states looking at what they are doing in the area of innovation, diversification of the economy, visiting Victoria and visiting the CSIRO and its co-location with Monash, we were invited in by the CSIRO to the centre of advanced manufacturing and the work they are doing with 3D printing there. Particularly the day we were there, they were doing 3D printing with titanium. Then we talked to the people behind the titanium project and they talked about titanium powder and we pointed out to them that a significant source of titanium is Western Australia.

Dr Wonhas: Just up the road here. I have actually worked there.

Mr F.M. LOGAN: Exactly. They said, "That is where we get our titanium powder from." I said, "Why isn't this work being done in Western Australia?" They said, "That is interesting because one of the companies from Western Australia will be here tomorrow"—which was Coogee Chemicals—"to talk about the very issue of the production of titanium powder and, by the way, the rear part of that bicycle frame that is over there that is made out of titanium was done for a Fremantle company." So it appears that a lot of the clients in the centre for advanced manufacturing in the area of 3D printing in titanium are from Western Australia. That then begs the question: Why are we not doing that here, particularly in the area of titanium powder and lithium battery manufacturing? Why have not we said to the CSIRO—sorry, Alex, why have you not said to your colleagues in the CSIRO—"We think that is an appropriate project for you to transfer over to Western Australia, given we are the centre for minerals research et cetera, and this is a cutting-edge area of minerals research and the possibility of advanced manufacturing as opposed to traditional manufacturing here in Western Australia?"

Dr Wonhas: This is actually a classic example of the approach that I have just tried to describe where we at the moment focus less on where the resources are at this point in time but for each particular project we are trying to bring in the most appropriate resources that we have available. Now, why is 3D printing in an additive manufacturing based in Melbourne? That is frankly a historic reason because there has been a very strong manufacturing industry that has struggled for a long time and we over the years have tried to identify new approaches that we can provide to the industry to underpin their long-term economic growth, and additive manufacturing is obviously one. The production of inks for 3D printing is a key component. Obviously, the resource largely comes from WA in Australia and I believe there is real opportunity, if we have the right backing, to make that work and build a new industry around it. But it actually then also relies on all of the other skills

which we happen to have in Melbourne, which actually then understand how to utilise those things and, frankly, how to then work with the local manufacturing industry to do something useful with those things.

Mr F.M. LOGAN: I just did not get to the point of what I put to you, Alex, and that was given titanium as one of the inks is such a critical and breakthrough form of manufacturing, why that study is still in Monash and the Australian centre for advanced manufacturing rather than the proposition that could be put to CSIRO of why not transfer that to Western Australia because your clients are here. At the moment, as you say, you have people travelling across the Nullarbor to talk to them.

Dr Wonhas: I think what typically happens if there is long-term sustained demand from our customers that we work with—I mean, typically we actually build up capability here to service that demand. But I think there is a risk at extracting that from maybe a subset out of the manufacturing space and putting it here because then it starts to lose all of the connections to that local ecosystem. I think what we need to do if there is really strong demand from the local industry that they want this product, that it actually is available for use here in WA and then industry can build a new business out of it. So, that would probably concern me more.

Mr P.C. TINLEY: Alex, there is a wider issue here in that what would be the benefit to Australia if there was a capability here in Western Australia? It is not about the domestic market of only three million people in Western Australia; it is about the connection to Asia and expanded opportunities. My question is: how much does CSIRO move down that sort of business model where it looks at where the markets might be and our connection to those potential markets?

Dr Wonhas: That is what we are really trying to do and that was, I think, also in my introduction. We look very hard at where are the strong local markets where we can create new opportunities and I think that is in the areas we have identified. What we then often find with new areas such as advanced manufacturing, it is often at the boundary line between maybe those two existing markets and then we need bring those capabilities together to ultimately develop a solution. In the end, I do not think it matters that much where exactly that solution gets developed as long as it is available to the user and as long as you ultimately create a new business around it because, frankly, that is where you get the real economic benefit. It is where the business will be generated. The research is often a small component.

Mr P.C. TINLEY: There is a certain clustering component here. Skilled manufacturing, where do I go? Advanced manufacturing, does Perth come to mind? If I am sitting there in Asia with an Asian business, or an Australian business that is looking to do work into an expanding market like China or Indonesia, if I think of advanced manufacturing, do I naturally come to Perth or do I naturally bias towards Melbourne?

Dr Wonhas: At the moment, I do not see the critical mass for advanced manufacturing in general in Perth. I think it is probably stronger in Victoria, but what we are trying to do is provide an entry point. However, there might be actually niche aspects of advanced manufacturing where maybe we can build a node that connects to the hub. So, we have talked about inks for 3D printing; that is one. Another one that I see quite strongly is again in the resources industry—advanced manufacturing of spare parts for the industry. It is a big issue, a big inventory holding cost, delays associated with actually getting those parts, so if we can help develop that kind of industry here, then again I think we have a strong local market here.

Mr T.K. WALDRON: Alex, from the Prime Minister down it seems that Australia is trying to develop a strong culture of innovation. How important do you think it is for the science industry to engage with school students, both primary and secondary? Is there a role for CSIRO there or are you already doing that?

Dr Wonhas: Firstly, culture is probably the most important aspect we have to solve if we want to become more innovative. I think, yes, it starts probably at school-age children but then it continues right through culture within the research sector but also culture within industry that I think we need to shift to become more innovative. We have selected programs of engagement with schools, where we have scientists who we send to schools. It is probably at the moment historically more focused on pure science than the enjoyment of science, but actually under our new chief executive, Larry Marshall, we are starting to shift this program to not only look at pure science outcomes, but also actually start to talk about innovation and how science in its application can lead to innovation that obviously creates benefits for the nation.

[10.40 am]

Mr T.K. WALDRON: Is there an advocacy role from the state government? With the Prime Minister putting emphasis on it, it gets people thinking, "Should we be doing it at the state level as well?"

Dr Wonhas: The state obviously has control over the education system. I would think it is a very sensible idea, and if that is something that you would like to discuss, there is certainly a more detailed discussion that we can have. We can also actually connect this to what we call our ON program, which is really our innovation vehicle, which has an incubator and accelerator and various engagement tools, and that is also in the innovation statement by the Prime Minister. That has actually been one of the key initiatives that have been highlighted.

The CHAIR: From your perspective, what might the state government do to enhance and further develop the Technology Park precinct?

Dr Wonhas: Which technology park are you specifically referring to?

The CHAIR: Bentley.

Dr Wonhas: We think there is a really strong opportunity by building on the SKA, which will attract a lot of top-class data scientists to WA and create, frankly, a critical mass of this resource that we can then apply in the traditional strengths industries in Western Australia. There are obviously many, many great applications of complex data science in that sector that can help us dramatically improve productivity in that sector. I think working on a really thought-through plan for that precinct, or Technology Park, that has the key capability providers as the central component and then looking strategically where and in which sectors those might be applied and then putting the right incentives in place for both the researchers to deploy into those sectors and the industry players to draw on those resources, because the push and the pull from both sides needs to be absolutely balanced —

Mr F.M. LOGAN: Just on that, do you think we are maximising the benefits we can get out of the Pawsey supercomputer? The reason why I ask you that—if you feel that is a bit too sensitive to answer in a public forum, there is no problem—is the committee went and spoke to DownUnder GeoSolutions, which is just up the road and has built its own six-petaflop supercomputer in Subiaco to crunch their data on oil and gas predictive analysis. They have done very well by doing it all themselves and probably could have made a major contribution to the Technology Park had they been over there and possibly expanded the Pawsey supercomputer. Do you think it has been used to its maximum benefit; and, if not, how would you improve it?

Dr Wonhas: I have not been aware that there are specific concerns that it has not been used to its full potential.

Mr F.M. LOGAN: Commercial potential?

Dr Wonhas: It is interesting. It is a research computer and so the allocation of CPU time is based on research criteria. If there was a desire to have more industry outcomes, changing those criteria probably then shifts the mix. The example that you have given is one of, I think, a number of

different examples where industry is actually investing in its own high-performance computing capacity. Certainly, from our experience, once you get into the really commercially sensitive part of computing, actually industry does not want to outsource that part because that is really the core of their business—understanding their resource, they really want to keep very tight for obvious reasons. I think if there are concerns, that is certainly a discussion that can be had on how we can make more time available for industries. But I think generally, from our point of view, we are certainly trying very hard to engage with industry on what applications they would use that computer for. I have not really heard of someone who has said, "I would love to have done that but I didn't get the computer time for it", as long as it is a sensible idea.

Mr P.C. TINLEY: I think this fact is right. The latest OECD ranking had us 37 out of 37 in PhDs working in industry. We seem to have an aversion to or we are frightened of PhDs and people with them. You got your PhD from Cambridge, I think.

Dr Wonhas: Yes.

Mr P.C. TINLEY: So you would have a different perspective perhaps about it. Why does it seem like only our PhDs want to go into academia? Is there something we are missing here?

Dr Wonhas: That is an interesting topic. I have to tell you a funny story. When I first arrived in Australia—I am originally German—and actually came just from Cambridge, people started asking me, "What did you do that PhD for? Don't you want to do a real job?"

Mr P.C. TINLEY: "What are you going to do when you grow up?"

Dr Wonhas: Yes. I think comparing Australia with Germany, for example, where I grew up, there is a real cultural difference in the perception within society and within industry—I am generalising here—of how important is science and technology for economic growth. In Germany, innovation is really seen as the key competitive advantage of industry and is really seen as the key driver. In Australia, in general, I do not think that is the case. When you look at, for example, the resources sector, I think that makes sense because innovation in itself is probably not the most important thing that makes a resource company successful. It can help as a secondary effect. But if we are really serious about innovation, I think we need to go on a journey where we start addressing that culture. Let us not lose some of the strengths that we are having in some of the sectors, but let us actually bring innovation thinking to those sectors and turn it to our advantage. That probably starts at schools, but then it continues throughout. One vision that I have, for instance, where WA will be fantastically positioned is not only being the home of great mining companies, but also actually becoming the home of great service companies helping the industry and really helping to provide the technologies, the approaches and the know-how anywhere in the world to help provide the world with resources. Because we have a very strong home market here, I think we have all the fundamentals in place, but we probably need to further shift our mindset.

Mr P.C. TINLEY: But going back to the point about PhDs in industry, the US, for example, has 60 per cent of its PhDs in industry. If you thought that was one of the major answers to the question of innovative societies and innovative economies, how do we put more PhDs into business?

Dr Wonhas: I think we need to have industry invest more into research, because when you have a PhD working in industry, you basically need to provide them with a platform for a three-year project where they can do work. But, actually, a lot of work for industry that we are doing is often shorter term. The industry prefers six-monthly reviews and it is actually very difficult to put a PhD student in such an environment. So, we need to basically have mechanisms where industry is maybe taking longer term horizon research on and then we can put PhDs in industry. Maybe just expanding on that, I think PhDs are probably one solution—I think a good one—but there are other mechanisms as well. One mechanism that we have used quite successfully we call researchers in business where we second, for a period of time, a researcher in an existing business to understand

what are the key issues that the business is facing and then to help apply maybe the latest thinking from the research base to develop a new product.

[10.50 am]

Mr P.C. TINLEY: A plug-and-play model.

Dr Wonhas: Yes, it is a bit of a plug-and-play model. You just have to make sure that you plug the right person for the right industry so that they actually play. We have had some terrific successes. One was with Textor, which is a manufacturing company. We seconded a researcher in business. They actually helped to develop a new, super-absorbent polymer, which then was so successful that they are now becoming a global supplier for Huggies worldwide. I think there are many more of those types of opportunities that we can unlock.

Mr P.C. TINLEY: We have not asked the MOF question.

Dr Wonhas: Yes, it is not the same as MOF, but it is related.

Mr P.C. TINLEY: We always have to ask the MOF question. We went to CSIRO and the chemistry building there. This young woman showed us the metal–organic framework and we were just gobsmacked. She said we could absorb gas molecules with it, so we have just spent $79 billion on three trains in Gorgon when we could have used MOFs!

Dr Wonhas: Well, yes, and I think that is true but that is actually an interesting one. MOF is an amazing material but to get it to a maturity stage where people make a whatever, $50 billion Gorgon investment into it —

Mr F.M. LOGAN: Hopefully, a lot less than that.

Dr Wonhas: Is it? That is good!

Mr F.M. LOGAN: No, for the new one!

Dr Wonhas: For the new one; okay.

Mr F.M. LOGAN: For the new one, it will only be $5 million.

Mr P.C. TINLEY: For the MOF train.

Dr Wonhas: Exactly, that is the breakthrough innovation. That actually takes a lot of time, investment and constancy of purpose. It is actually quite hard to make those types of breakthroughs happen because that is a 10 to 20-year time horizon and it is often very hard in our short-term world to get that constancy of purpose. But if you do, it can really change the world. I mean, we all talk about the shale gas revolution and that has probably had some negative impacts, actually, on our LNG industry here. But when you think about how long it has taken to develop this industry, it is quite phenomenal. The first shale gas well was drilled in 1824. The technology has been around since the 1980s and constantly and gradually improved until it came to the tipping point where that technology was more cost-effective in the US market environment than the alternative. Then you suddenly get a very significant —

Mr P.C. TINLEY: Yes, like PV and so on.

Dr Wonhas: Yes, it is the same example.

Mr F.M. LOGAN: Alex, can I just come back to your comparative analysis on culture between, for example, Germany and Australia and dig down just a little bit further. There is an awful lot of debate at the moment about STEM and how you roll STEM out through our education structures, whether from primary through to technical colleges. But is it more than just STEM? Is it a cultural thing? Is it, for example, in Germany where there may well be a drive for inquiry at a very young age and investigation at a very young age, which we just do not have? That could be a learnt thing in our own education system—that push for children to inquire.

Dr Wonhas: I think, and I have said this before, culture is probably the key. I mean, when you look at successful innovation overall, you need great capabilities and the right capabilities, so that is where pure STEM education comes in. We spoke a lot about having the right local markets where you can actually build, for instance, new businesses, but then connecting those too, it is where culture comes in. As we all know, cultural change is a very difficult one. It is a long-term one. From my experience, it often works best having examples and role models. What we often see in our work with industry, the rate of repeat business is actually very high. Once people have actually seen with a new innovation that they genuinely can drive and improve business outcomes, that is actually typically when they come back and say, "Okay, so what's the next thing that you have available?" I think equally with children fostering that, exposing them to examples, creating real role models for them—I mean, in the digital space, I think in the US, there have been a lot of role models of 20-something-year-olds who really have done amazingly well and have fulfilled some big dreams that they had.

Mr F.M. LOGAN: Which has encouraged others to follow.

Dr Wonhas: Exactly.

Mr F.M. LOGAN: Hence, Silicon Valley.

Dr Wonhas: Yes. So I think celebrating that is key.

The CHAIR: One of CSIRO's key responsibilities is to encourage or facilitate the application or use of scientific research. Some people would probably say that CSIRO has traditionally tended more towards the academic end of scientific research. Do you see a role for yourselves in overcoming the valley of death; and, if so, how, especially in WA?

Dr Wonhas: Firstly, I think we, probably as an organisation, focus more on the applied than on the academic work. The valley of death that you have mentioned, I think, is a key barrier to any technologies, in particular many technologies that apply in the energy and resources sector because it is typically long-lived assets, very capital intensive and require often large-scale up-front costs. That makes the valley of death even worse. We have historically not done a lot of work to help overcome the valley of death. We typically just stop before it and I have seen quite a few things —

Mr P.C. TINLEY: Watch them descend into the valley, yes.

Dr Wonhas: See into the valley—none of my business! But that is something that we are changing. We are in the process of establishing a venture fund that has also been announced by the Prime Minister in his innovation statement. We have put in $30 million of our wi-fi money and the government has given us $70 million and we are now actually looking for matching contributions from industry to that to build a fund. The differentiator for that fund will be to focus on in particular what we call deep tech; that is, the technologies that are actually difficult to bring through the valley of death by basically changing the risk hurdles and therefore have finally a vehicle that can bring some of those technologies across. That is something that we are very actively working on and that we believe is an important contribution we can make.

There was a second part to your question: how does this apply to WA? Obviously, we would be only too glad to actually invest in WA from that fund.

Mr F.M. LOGAN: Titanium powder?

Dr Wonhas: Good.

The CHAIR: Thank you for your evidence before the committee today. A transcript of this hearing will be forwarded to you for the 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 via 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 for the committee's consideration when you return your corrected transcript of evidence.

There is a chance that when we have a look back through it, there might be some other questions that occur to us. Is it okay if we send them to you?

Dr Wonhas: We would be only too glad to assist.

The CHAIR: Thank you for your trouble today.

Dr Wonhas: No, thank you very much. Good luck.

Hearing concluded at 11.00 am

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