

# **ECONOMICS AND INDUSTRY STANDING COMMITTEE**

## **INQUIRY INTO THE ECONOMIC IMPLICATIONS OF FLOATING LIQUEFIED NATURAL GAS OPERATIONS**

**Please note:** this transcript of evidence has been made available by the Committee for the purpose of assisting those who might be in the process of preparing a submission in aid of the Committee's inquiry into the economic implications of floating liquefied natural gas operations.

**TRANSCRIPT OF EVIDENCE  
TAKEN AT PERTH  
WEDNESDAY, 26 JUNE 2013**

**SESSION THREE  
CLOSED SESSION**

**Members**

**Mr I.C. Blayney(Chair)  
Mr F.M. Logan (Deputy Chair)  
Mr P.C. Tinley  
Mr J. Norberger  
Mr V.A. Catania**

---



**Hearing commenced at 11.03 am**

**PHIMISTER, MR STEVEN ROBERT**  
**General Manager, Shell Australia, examined:**

**GROSE, MR IAN**  
**Commercial Manager—East Browse, Shell Australia, examined:**

**KAUFFMAN, MR STEVEN**  
**Engineering Manager, Shell Australia, examined:**

**The CHAIR:** If I may, I will just go ahead with the opening statement. On behalf of the Economics and Industry Standing Committee, I would like to thank you for your attendance this morning. The purpose of today's session is for the committee to receive a briefing in aid of its inquiry into the economic implications of floating liquefied natural gas operations from the representatives of Shell Australia. I will take this opportunity to introduce myself and the other committee members present today. I am Ian Blayney and I am the member for Geraldton; Jan Norberger, who is the member for Joondalup; Peter Tinley, who is the member for Willagee; and Vince Catania, who is the member for North West Central.

The Economics and Industry Standing Committee is a committee of the Parliament of Western Australia. This hearing is a formal procedure of the Parliament and therefore commands the same respect given to proceedings in the houses themselves. This is a closed briefing and Hansard will be making a transcript of the proceedings. If you refer to any documents during your evidence, it would assist Hansard if you could provide the full title for the record.

Before we begin, I need to ask you a series of preliminary questions. Have you completed the "Details of Witness" form?

**The Witnesses:** Yes.

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

**The Witnesses:** Yes.

**The CHAIR:** Did you receive and read the information for witnesses briefing sheet provided in advance of today's hearing?

**The Witnesses:** Yes.

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

**The Witnesses:** No.

**The CHAIR:** Would you please state the capacity in which you appear before the committee today?

**Mr Phimister:** I appear here on behalf of Shell Australia as the general manager in our upstream business.

**Mr Grose:** I appear here as the commercial manager for Prelude.

**Mr Kauffman:** I appear here as the engineering manager for Shell Australia.

---

**The CHAIR:** I would just like to point out that the house starts to sit today at midday, so that means that we will have to be out of here by about 11.50 am, because it is a grievous offence not to be in the Parliament when it starts sitting. If we do not get the minimum required numbers, we have to go home for the day.

**Mr Phimister:** Okay.

**The CHAIR:** With that, I would like to invite you to begin your briefing.

**Mr Phimister:** Thank you, Mr Chairman, and members of the committee, and thank you for the opportunity to appear here today and the invitation to be with the Economics and Industry Standing Committee. Our CEO and country chair, Ann Pickard, asked that I attend this session here today. I have about eight or nine years in our Australian business and various assets, including new business development and some of our development assets. Our two colleagues with me today who have introduced themselves: Mr Kauffman is our engineering manager in Shell Australia in our upstream business and Mr Grose is the commercial manager. Both of these gentlemen have a longstanding history in Shell Australia and they have also worked elsewhere in the world in the Shell group. Together they have strong collective knowledge on floating LNG—the technology and the project, Prelude, itself.

Mr Chairman, as you know, Shell is the operator of the Prelude floating LNG project in offshore Australia, and that is the only FLNG project at the moment in execution phase in Australia. We noted from the committee's invitation today that you are in an information-gathering phase, so, with your agreement, what we thought we might do is run a presentation based upon Prelude and use that as a means by which to bring information to you to help you and assist you in visualising what floating LNG is and how floating LNG will impact upon Australia and Western Australia. We hope that that might be a means to assist the committee. With your support, we will try, if we have enough time at the end of the presentation, to take any questions you may have for clarification. The presentation has three parts. We talk very briefly about LNG in Australia and our part in it, and then floating LNG and Prelude, and then the impact that may have upon Australia and Western Australia.

To kick that off, we actually have a very short video which we would like to run—it is around two minutes only—which we hope may help to visualise the actual technology and the actual equipment. It is designed for a broader audience, not specifically for today or the committee, but we hope it will be helpful in visualisation, and then we will go on into the presentation, if that is okay.

**The CHAIR:** The floor is yours.

**Mr Phimister:** Great.

[Video played.]

**Mr Phimister:** Mr Chairman and members of the committee, I would like to first briefly talk about Shell's involvement in Australian gas. Shell has been in Australia now for over 100 years and we are a significant investor in both upstream and downstream businesses. We employ something like two and a half thousand people, of which around about 500 are employed currently in the upstream business, and that is growing. Over the next couple of years we anticipate we will reach 750 to 800 people in the upstream business here in Perth mainly. We have a long and deep history in Australian gas, and we have been a long-term investor, starting with our investment in the North West Shelf, along with our five partners. Shell was a foundation investor and, indeed, the technology provider for North West Shelf, which is shown on this map here. Today we retain our one-sixth interest, obviously operated by Woodside. But, in addition, we are also an investor in most of the other major LNG and gas projects shown on the map. That includes the greater Gorgon area, where we have a 25 per cent interest, obviously operated by Chevron, and just along the road a smaller interest in the Wheatstone Chevron-operated project.

---

Moving along the coastline there, we have now close to a 30 per cent ownership in the Browse project. We have a 67 and a half per cent interest in our own operated Prelude floating LNG project. There we are the operator, as I mentioned, and we have partners there in the form of major gas customers and Asian utilities: KOGAS from Korea, CPC from Taiwan, and Inpex from Japan, who collectively own 32 and a half per cent. We also have an interest close to 30 per cent in the Sunrise project further north, and we are operator and a 32 per cent owner in the Evans Shoal project. Also in recent years we have added to our portfolio assets in the east, in Queensland, where we are a 50 per cent owner with our partner, PetroChina, in the Arrow Energy coal bed methane to LNG project.

In addition, we have a range of exploration activities around the Australian coastline, both operated by us and operated by others. I mentioned we are a significant investor in Australian gas. Over the coming five years Shell will invest over \$30 billion in this business, at over \$6 billion per year, which will continue the longstanding investment profile we have had in Australian gas. We are fortunate enough to be a fairly significant player globally in the LNG and gas business, and Australia is incredibly important to Shell; it is a significant part of our global business, and particularly in serving the Asia-Pacific markets.

If I may, I would like to go to the Asia-Pacific markets and talk for a moment about those. I am sure the committee will have heard or will hear also from others about how that marketplace is changing. We have seen quite staggering growth in the LNG business globally and quite a change in its nature. Over the past 10 years we have seen a doubling in the number of regasification terminals. We are now at something like 90 terminals worldwide in 25 countries, so it is a significant increase in the customer base, and, looking forward, a number of commentators in the market have said that by 2030 we would expect another 200 million tonnes a year of global LNG growth, and that is on a base today of around about 250 million tonnes, so almost a doubling. Several commentators suggest that a half of that 200 million growth will come in the Asia-Pacific region. So, Australia, which has been a very major producer into that market, also has another opportunity on its doorstep with significant growth, and that remains key.

But if I may just turn to what is going on in the market currently in our traditional markets in Asia-Pacific: this map depicts what we think and what commentators believe will happen in 2020. What we are actually seeing is the previous hemispherical markets between the Atlantic basin and the Pacific basin are starting to experience some cross-flow product coming from supply into those traditional markets, and that is indeed what people are expecting to happen in Asia-Pacific going forward. The main supply competition is expected from North America, Canada and the US, where it is quite well documented, the growth they have had in relatively cheap shale gas production, and we would anticipate in the coming years, with export licences now being granted by the authorities, that LNG is coming our way into our traditional markets. The same we believe will be true of East Africa, where tens and tens and tens of trillions of cubic feet of gas have been discovered in recent years, and we also have the traditional Middle Eastern market, which is a strong competitor for us.

[11.15 am]

This move is actually driven by customers. The customers in our traditional Asian markets are actively seeking for supply diversification and they are actively seeking to lower the cost of their gas that they import. These customers are participating in LNG projects in supply and they are driving for new sources of supply and lower cost sources of supply and that includes pipeline gas. There has been some recent news on deals done in China to bring in Russian and Middle Eastern gas, so that also fits into the picture of supply competition in our markets.

We have in Australia gone through a fabulous period recently in growth in the LNG business. It has been well documented and I will come to that in a moment. We hope that that can continue. What we believe will happen, and a number of commentators recently have started to talk about, is the next wave of projects from Australia, and how much competition it is going to face. That is

competition coming from those new suppliers, which are relatively low cost. I think McKinsey recently published a report suggesting a 20 to 30 per cent advantage over Australian LNG and very large volumes of gas that are now approaching investment decision. So, these projects would be expected to be sanctioned in the near future. That does not mean we cannot win the business; it just means it is getting awfully tough and we have to do something to remain competitive in that landscape. Speed will be critical and competitiveness on the cost front will be critical.

If I may, I will just talk very briefly about what has been going on in Australian LNG, which is a well-documented growth, a fabulous growth, in our LNG business in Australia. It has been a bit of a golden era, frankly. Currently in production we have three projects—the North West Shelf, of course, Pluto in the Burrup and then also Darwin. They account for something in the order of 24 million tonnes a year of production capacity. But of course in the last five, six, seven years, a considerable number of projects have been sanctioned, so where we had three producing projects with seven trains, we now have another seven projects constructing another 14 trains, accounting for probably another 60 or more million tonnes a year, taking Australia's total supply capacity to something like 85 million tonnes a year of LNG—quite a staggering growth. Those projects, of course, are projects such as Gorgon and Wheatstone, Ichthys and Prelude and three coal bed methane projects on the east coast that have been sanctioned—Queensland Gas, Asia-Pacific LNG and Gladstone LNG. What is very interesting is the number of future opportunities we may have, which is shown by the purple bar to the far right. There is possibly another 40 million tonnes of projects that Australia could get away in the coming period. That includes the likes of Scarborough and Browse and expansions maybe to Gorgon and Pluto and Sunrise and Bonaparte and Arrow Energy, so a whole range of projects that will be competing for that. One of the interesting facts I maybe should have mentioned in the last slide is that competing for that 200 million tonnes a year of global LNG growth, Australia is not the only country that has projects that could meet that. In total, I have seen commentary in industry papers of 350 million tonnes of potential supply that could be sanctioned to meet that 200 million, so there is a lot of volume that we will be competing with. So, for these projects to get away into that environment, we are going to have to do something quite special. I think the Australian LNG industry is already well engaged in this subject and looking at how it can compete in that market. It is looking to adapt to remain competitive. We have had a fabulous run and we wish to continue it. The existing model and the traditional model is being looked at and potentially reviewed. Innovation is underway, cost savings are underway in construction-led design, modularisation, simplification, standardisation—these are all things that the LNG industry is already doing. Indeed, some of it is appearing in the existing projects that are being constructed.

One of those aspects and one of those things is floating LNG. Floating LNG is another response to that environment and to remain competitive. It has evolved in recent years to a solution to smaller gas resources or more remote and is now being considered by people in Australia and in other countries as a solution for cost competitiveness and to be competitive in that market we have been talking about. It does simplify a number of matters and it does allow you to phase in and control spend in the capital phase. So, it is a potential solution and it is one of a range of things that the Australian industry and the global LNG industry is already actively considering. That creates an opportunity for us, I think, in Australia. I know there are a number of projects also considering floating as an option against other more traditional land-based projects. If we were to capture that business in Australia as an industry, I think it offers us an opportunity to build some kind of hub and the technology and services around that new design and innovation. That is an opportunity we would need to reach out and create as an industry and government together.

If I may, I would just like to quickly introduce the Prelude project and then we will go into more detail on the actual project. Prelude itself is situated around about 475 kilometres north-north-east of Broome—shown on the map in the bottom right—200 or so kilometres from the nearest land. It was discovered in 2007 and then, subsequently, the Concerto gas field in the same licence nearby in

2009. Altogether there is approximately three trillion cubic feet of gas, so on the scale of Australian LNG, a relatively small resource. But that will support a production capacity of 25 years of 3.6 million tonnes of LNG a year and then together another 1.7 of LPG and condensate. That is quite an important fact around Prelude; it is quite a liquid-rich gas and therefore there are other liquid products that will be produced and exported. It will remain there on location for around about 25 years once it is towed to location. It is a sizeable facility, which my colleagues will talk about in a moment, close to 500 metres long and 75 metres wide, and fully ballasted it is something in the order of 600 000 tonnes all up weight. Approximately 130 people are on board in steady state operation for normal operations and offloading, and supported by a number of supply and tug vessels, both for emergency response and supply to the FLNG but also tugs for the berthing of the LNG carriers when they come on the site. So, we do operate this project as mentioned with our partners from Korea, Taiwan and Japan. With that, what I would like to do is ask Mr Kauffman to take over and talk a bit more about the technology.

**Mr Kauffman:** Thanks, Steve. Good morning Mr Chairman and members of the committee. If I might first just briefly introduce my background: I started working in floating LNG in 1999. That was about two years after Shell started looking into the technology in detail. I have lived in Perth since about 2003. I also worked in our Geelong refinery for 12 years and also in Shell's technical centre in the Netherlands for nine years. I appreciate with floating LNG that there is a broad array of topics to cover, but I have taken the liberty for today to focus particularly on safety and reliability.

When this technology effort first started, it was recognised that as the easier to develop onshore gas or near-to-shore gas became depleted, there would be an increasing proportion of offshore gas regarded as stranded. So, our objective was to try to make what might otherwise be considered uneconomic to develop, economic. As Steve said, floating LNG was one approach taken. As depicted in the centre part of this picture, floating LNG encompasses the offshore structures and processing, the pipelines, the gas treatment and liquefaction facilities and the storage and loading facilities. It integrates these into a single facility. The facility is large, but if we compare its quantity of steel to all the construction material needed in a pipe-to-shore LNG project, it actually reduces and simplifies the construction quite substantially. As our resources become increasingly stranded, the total quantities of steel and concrete and rock, if I add all of that up for a traditional LNG scheme, it can add up to in the order of 10 million tonnes or greater. By contrast, floating LNG requires 0.3 million tonnes of construction material to achieve the same thing. This degree of simplification is recognised by other operators as it does translate into both cost and schedule improvements, particularly for complex LNG developments. So, while FLNG is new to the industry, its innovation lies mainly in the way that it integrates practices, processes and equipment that are already well known to the oil and gas industry. It draws significantly on existing offshore production experience. It actually uses the same technology to treat and liquefy natural gas as you do onshore. It uses the same technology to store and offload products as found in the LNG shipping industry, and it uses the same robust steam equipment that is well proven in the marine industry.

The design objectives that Shell set at the outset of its development of floating LNG were to be safe, standardised—meaning design one, build many—robust, cost efficient and with a high availability to enable continuous and stable LNG supply. These objectives are reflected in some of the key characteristics of the design, which I will just run through quickly. If we look firstly just at the general layout, you will see that the accommodation is at the back of the facility and you have the flare at the front of the facility. This arrangement provided the lowest overall risk after factoring in the safety of the product carriers and the crew, helicopter movements, supply logistics, as well as the safe operation of the FLNG. We have carried out quantitative risk assessments repeatedly at successive stages of the engineering to validate that arrangement. The second feature is that the type of equipment chosen and where we place processes within the train are also effective measures to increase the safety of the facility. I will just draw your attention to a couple of features. With the

power generation or the utilities module, which you see towards the back, it actually creates 100 metres of separation between accommodation and the first of the hydrocarbon-containing processes.

[11.30 am]

So in the same way as you would in an onshore LNG plant, we still use distance to help with the management of safety. A second feature—if you can see where “gas treatment” is pointed to—typically gas treatment on an onshore plant is located right at the very front of the train. So here we do not place processes by their processing order, we place them by their contribution to risk. Gas treatment is a very low contributor to risk and it is located closer towards accommodation, and those processes that are higher risk are located closer towards the front of the facility. You will also notice gaps between the modules. These are 20-metre wide safety gaps. Collectively, all these types of features have been able to demonstrate, through the quantitative risk assessment work done, that the safety of the facility is as good as modern offshore production facilities.

I also wanted to touch a bit on motion and loading. The effect of motion, both of the LNG carrier and the FLNG, has similarly been tested through all the successive design phases we go through—from concept engineering to basis-of-design engineering and then into detailed engineering. The testing has used actual metocean conditions. The photo in the bottom right corner of the slide is at the MARIN basib facilities. We have used actual metocean conditions there to model the responses of the facility to the metocean conditions. With the term “metocean” I am talking about both wind and sea, so both prevailing ocean and weather conditions. The picture I show in the top right is actually a full-scale model of the actual loading arms that will be needed on floating LNG. It was tested through a joint-industry project led by FMC and was able to test the full-scale and actual equipment with the amount of motion expected between the carrier and FLNG.

Shell Australia initiated a series of concept safety design consultations with NOPSA—now NOPSEMA of course—in 2008. This was to discuss operational safety, process integrity and inherent safety and design for floating LNG. The early engagement allowed the regulator to understand the FLNG technology innovation and therefore carry out its own safety assessments in a timely manner and seek assurance and verification on the final safety assessment studies that we had done.

Lastly, I just wanted to run through a couple of other important features. The facility is designed to a one-in-10 000-year weather event. This ensures integrity beyond the conditions of cyclones. The substructure—the hull section of the facility—is designed for 50 years, and it is the expectation that dry dock maintenance and also a rejuvenation of topsides—rejuvenation is the same sort of activity we do with onshore plants for life extension—the facility can be used after Prelude. The facility remains on station and manned during a cyclone. Its size, which Steve referred to earlier, is actually an important safety feature in this regard. By remaining on station, it improves its overall availability substantially in comparison to FPSOs. This is mainly because it does not have to disconnect and reconnect. It does not lose that production time; it has that time available to continue producing.

Finally, I will refer to the total system availability. When I talk about “total system availability” I mean recognising all of the equipment that is on the seabed, that runs up through the risers, recognising all of the equipment on the topsides and accounting for the occasions that LNG carriers cannot come in and berth because of prevailing weather conditions. So, when you take all that into consideration, the overall system availability is still very similar to onshore LNG schemes. That was just a bit of a rundown of the development of FLNG over a decade or more. At this point, I would like to hand over to my colleague Mr Ian Grose to discuss Prelude more specifically.

**Mr Grose:** Thanks, Steve. Mr Chairman and members of the committee, a bit of background on myself just to start with. I joined Shell also at Geelong refinery as a process engineer over 30 years ago and I have worked in refineries and LNG plants in various capacities over that time. I first came



to Perth in 1983 when I was seconded to Woodside for the North West Shelf project. I have to say I am very proud of being on the Prelude floating LNG project, which has recently passed 11 million man hours without a lost-time injury, and I feel privileged to be a part of yet another first for Australia and the world, having also been in the operations team for the first gas-turbine driven air-cooled LNG plant in the world when we started that up in Karratha at train 1 in July 1989. To be on another first is a great privilege for me. I have been part of the Prelude project since 2007, engaging with many of the key stakeholders for the project trying to ensure that we obtain all our required approvals and get the commercial agreements in place in a timely manner, and also trying to make sure that we contribute positively to the communities in which we work.

With this slide I would like to explain a bit more about how logistics play a key role for the remote location that the FLNG facility is in and to explain each of the different locations. Of course, Perth is our corporate headquarters for Shell in Australia, and operations will be managed from our new building that will be built at Kings Square by about 2015. We will have our supporting technical expertise located in Perth. They will be able to monitor in real time the FLNG facility through a fibre-optic link, which reduces the number of people we need to have working offshore; we can do a lot of work in and obtain expert advice from our facilities in Perth.

In Broome we will have the support for the aviation base. The helicopters will take the crew changes out to the facility once a day, which is about a two-and-half-hour trip and requires a call into the Lombadina strip for a refuel on the end of the Dampier Peninsula there. Also in Broome we have a marine port capability for supporting the tugs that are out on the FLNG facility during the operations phase. We will always have two tugs out there to help with product carrier berthing and also to act as emergency response vessels. We will have three of them, in fact, because we always want to have two out there and the other one can be coming back into Broome for crew change, refuelling and so forth. Broome will have an important function for them. Right now, Broome is our drilling supply base. We expect to commence drilling the development wells for Prelude in the next quarter, and that will take the next couple years. So there is quite a lot of work happening in Broome now for that.

In Darwin we are building an onshore supply base. That will provide the equipment and spare parts warehouse and forwarding facilities for sending maintenance out for local industry to do maintenance work on our equipment. It will also act as the marine port for a supply boat that goes up once a week between Darwin and the facility.

On the FLNG facility itself, as Steve said, there are about 130 people on board, but we actually have beds to cope with 340. That is to allow for maintenance events when we have a schedule shutdown or some such thing.

If I can turn then to what value we see Prelude floating LNG giving to Australia. We see that development of the Prelude gas resource by this project has considerable value. Our project philosophy is to provide full, fair, and reasonable opportunity for Australian companies to participate and to recruit Australians as first priority and for them to be based in Western Australia. We also look to create opportunities for Indigenous peoples by implementing our reconciliation action plan. Our Australian industry participation plan was approved by AusIndustry and the Industry Capability Network of Western Australia back in 2009. We set off with this early enough to try to make sure that we could get local companies onto the prequalification bid lists. If we do not get them on early, it makes it hard later on when the tendering starts happening. In 2010 we used ProjectConnect to seek expressions of interest from Australian companies and ICN WA was able to support us by shortlisting capable companies to put forward to the contract. With the construction of the FLNG facility scope happening mostly overseas, I have to say we do not expect a high degree of local content for the FLNG scope, but we did get a number of companies onto the bid lists and we have had a few wins. The FLNG cranes are being done by Favco and the pressure hydraulic unit is from Pressure Dynamics based in Welshpool. So, we have had a few successes. We are at the point

---

now where we are starting to ramp up on drilling, and subsea installation will come after that. At this stage local content on drilling is at 37 per cent, and 20 per cent on subsea, but we expect that to increase as the work starts to take shape. For onshore scope, obviously we expect a very high Australian content. We are continuing to use the ProjectConnect website with ICN WA to advertise all the opportunities on the project going forward.

[11.40 am]

A couple of years ago we had ACIL Tasman do a study for us on the national economic benefit over 25-year project life and there are some numbers you can see up there on that slide. In real terms, correcting for inflation, it can be seen that the employment of 350 direct and 650 indirect people on the project, plus the production of a significant export stream creates substantial economic benefit such as an improvement on the balance of trade by about \$18 billion and payment of \$12 billion in taxes over the project life. In addition, the project operating costs and later capital expenditure required for gas backfill tie-ins will amount to a further \$12 billion into the Australian economy.

During the operations phase we have a number of contracts we need to award. Our experience has shown that in operations phase developing local support and relationships is key to getting improved equipment availability in the long term, and that ultimately delivers more cost-effective and efficient outcomes. That means that, having established that we have safety and quality as givens, after that Australian content is a key driver, ahead of cost. As part of getting ready to operate we will put in place some 200 contracts between now and 2017. We are expecting that that will produce around \$200 million of benefit to the local community if we get about 70 per cent local content. One of the differentiators of FLNG is that the maintenance work profile is steadier than for an onshore plant. Because we have a restriction on the number of people you can have out on the FLNG facility, we restrict the scope of our maintenance turnaround to as small as possible. Because of that, we have a lot more routine maintenance during normal operation and that gives a steady flow of work to the industries that support us in doing maintenance work for our equipment. That helps them with long-term employment, apprenticeships and cash flow. On employment, we will have around 350 staff working on Prelude by 2017, but with so many LNG projects under construction at the moment, we can see that it is a very tight market and we are working hard to recruit our operations and technical staff. We have a strategy of recruitment waves and of recruiting the experienced staff first and then following up with the less experienced in the later waves. That way we bring on people. Most recently, we had over 1 100 applications from Australians and attracted a very high calibre of people who are most excited to work on floating LNG. We have made offers to 32 so far and that is building on about 60 Australians working in the operations section so far. There will be more recruitment waves over the next few years.

On opportunities for Western Australia, we are partnering with local institutions, government and industry to capture value from Prelude operations and future LNG growth in Western Australia. One of the things we are doing is we are proposing, together with other oil companies, service providers and universities, to create an oil and gas industry innovation precinct. That will foster innovation for the development of oil and gas in WA. Also, we have worked with Curtin University and Challenger Institute of Technology to develop an FLNG training consortium. We see this as very important because with the hot labour market, we cannot be expecting all the experienced staff we need, so we need to have the capability to train them to address any competency gaps that could be there. This consortium is going to offer that, particularly using the ACEPT facilities in Henderson. We will then supplement that by sending these recruits around after the technical training to get actual on-the-job experience in Shell locations around the world. Then they will turn up and go to either help with the final commissioning and that of the facility, so that by the time this thing is towed to site we have a really fully experienced capable operating staff.

---

We are also sponsoring the Shell EMI chair under Winthrop Professor David White—you can see a picture of him there. This chair of offshore engineering is going to continue to build the knowledge that will widely benefit Australia's offshore industry. We have had a long collaboration with UWA and they have, indeed, more recently been working with us on offshore foundation systems for the design of the Prelude mooring system. As part of our environmental licence conditions we had a requirement to produce an oil spill scientific monitoring program and get that approved by SEWPaC and NOPSEMA. We have successfully done that and we have engaged the Western Australian Marine Science Institution along with the Australian Institute of Marine Science and the CSIRO to undertake environmental baseline studies and develop an oil spill monitoring capability in the event that we have an oil spill. We also look at social investment in the Kimberley region, particularly focusing on education. This is to drive early-stage capability and skills and workforce development, particularly for disadvantaged and Indigenous peoples. The next steps are that we will engage with state and federal government in a local-content round table and work together on building industry capability for the Prelude operations phase. We hope to use our network and share analogues around the world. Thank you very much.

**Mr Phimister:** Just very briefly, if I may, Mr Chairman, to wrap it up. I hope we have provided useful information to the members this morning. Just briefly, we have presented the company Shell in Australia and how we are deeply invested and deeply involved in the gas and LNG business. The floating LNG technology itself is a response, alongside other responses, to keep Australian energy competitive in the face of an increasingly competitive and difficult market in the region. We believe that our technology has the same safety and reliability of similar Australian oil and gas facilities and has been designed to be so over a number of years. We believe that the projects will bring something in the order of 1 000 full-time jobs and benefits to the Australian nation, as Mr Grose has spoken to. We are currently in the contracting phase and at the moment we believe that around about 70 per cent of our operating contracts for operations and maintenance's core services will be worth over \$200 million a year to the Australian community. As Mr Grose spoke of, we are recruiting on an Australian-first principle, working with local institutions and skills development and going forward to working with industry and partners now also to try to find other ways in platforms for supporting Prelude FLNG and FLNG in Australia. As I said, I hope that has been helpful to the committee, Mr Chairman, and I would like to thank you again for the opportunity today.

**The CHAIR:** Thanks a lot. We have got time for just a couple of questions.

**Mr P.C. TINLEY:** Steven, thanks for that, it was a really detailed and helpful actually. FLNG is obviously a place where Shell is going globally and we have all identified that. You have got 10 on the go, is that right?

**Mr Phimister:** No; at the moment the only floating LNG project we have in execution is Prelude in Australia. There are other projects worldwide and here in Australia that are considering floating LNG technology, but Prelude is the only one that we have going currently.

**Mr P.C. TINLEY:** I just note that Samsung Heavy Industries has a lot in construction or pipeline construction.

**Mr Phimister:** I think maybe the member is referring to the agreement we have with the Technip–Samsung Consortium. We have in place a master agreement or framework, if you will and the principle, as Mr Kaufmann explained, is of this concept of designing FLNG for replication—standardisation.

**Mr P.C. TINLEY:** Yes, that is where I picked it up from.

**Mr Phimister:** We have actually a framework agreement in place and that will facilitate the production of multiple FLNGs if that is required. That is a global arrangement.

**Mr J. NORBERGER:** That was very thorough.

---

**Mr P.C. TINLEY:** Just one last one from me. To go into the safety issues around these things, and we will obviously unpack a lot of these things as we go into the inquiry, what was the most significant incident that has happened to an FPSO in your global study of the risk matrix? Where has been the most significant incident that you are aware of?

**Mr Phimister:** I cannot think of any off the top of my head right now.

**Mr Kauffman:** No; the only one, not as a major incident—the main safety-related incidents during operation tend to come from the disconnect and reconnect activity, so avoiding that activity is helpful. But by and large they are safe; they have had good offshore safety record and performance.

**Mr Phimister:** Just to follow up on that, of course as presented, that is for one of the key design safety reliability criteria we have used in floating LNG; how not to uncouple and move off location is critical.

**Mr J. NORBERGER:** This is not so much question but a very quick statement. I was particularly interested in some of the initiatives you are doing in regard to higher learning and the PhD scholarships and the like. When you do your submission it would be really great to get a bit more information on that. Obviously this is something that I take a personal interest in because I know it develops a centre of technological excellence and whatnot and it sounds like you have a few things bubbling away there. I would be really interested to find it a bit more about the PhD program at UWA.

**Mr Phimister:** Absolutely, we would be delighted to put more information for the member in our submission.

**The CHAIR:** In closing I would like to thank you for your attendance before the committee today. A transcript of this briefing 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 for the committee's consideration when you return your corrected transcript of evidence. I would just like to wish your boss, Ann Pickard, all the best with her next position. And with that thank you for your time.

**Hearing concluded at 11.52 am**

---