TRANSCRIPTION

2018 OPERATIONAL BRIEFING

6 FEBRUARY 2018

[START OF TRANSCRIPT]

Sam Dobson: Good morning everyone. Welcome to Macquarie's 2018 Operational Briefing. For those who don't know me, I'm Sam Dobson, the Head of Investor Relations. Before we get started, can I just ask that you either switch your mobile phones off or put them to silent? In the audience today, we have with us institutional investors and analysts and on the teleconference, participants include members of the press and webcast viewers, so welcome to you all.

The purpose of our Operational Briefings, as you know, is to hear management present on various aspects of the business in more detail. This year's briefing will start with an update on the overall group for the third quarter, as per our usual practice and this will then be followed by three presentations on three themes that we view as important in the medium term for Macquarie, infrastructure, energy and technology, as you know.

The format of today's session will be as follows: a short video will precede each of the thematic presentations; Nicholas will give a short introduction which will be followed by a panel discussion with our Group heads. I'll then open the floor to Q&A on the conclusion before we move on to the next theme. In addition to today's presenters, in the front row we have some of Macquarie's senior management who are also available for questions.

On arrival this morning, you should have received the documents that we lodged with the ASX, including the presentation that we will be going through today. The aim is to finish the briefing today by 12 o'clock as we've got on the slide. So with the formalities out of the way, I would like to introduce the first section of today's briefing, which is a Group update since the interim results and I welcome Nicholas Moore, our Chief Executive and Managing Director.

Nicholas Moore: Thanks Sam and thank you all very much for coming today, you're all very, very welcome. It's great to see so many familiar faces. I know many of you have been following our story for many years. Now my first slide will be familiar to you all. This is the description of the Macquarie Group and as I always say, you can't understand Macquarie without actually paying attention to the five different businesses that we actually carry on here. Largely unchanged from when you saw it last. There has been a small change in terms of Macquarie Capital, reflecting management changes that were made towards the end of last year.

Now turning to the update for the third quarter. Overall satisfactory trading conditions for the third quarter across the Group. The annuity-style businesses, this is Macquarie Asset Management, Corporate and Asset Finance and our Banking and Financial Services businesses, net profit contribution for the quarter was slightly up on where we were this time last year. On a year-to-date basis, the net profit contribution from these groups is up. It's up due to the strong performance fees we've talked about before in MAM, the timing of transactions in CAF and of course the continued growth in Banking and Financial Services we've talked about now for a number of years.

The capital markets facing businesses for the quarter, that's Commodities and Global Markets and Macquarie Capital, their combined net profit contribution was down on where we were last year, but that's primarily as a result of income recognition associated with the transportation and storage agreements within our commodities business. Similar story year to date in terms of where we stand, the results in the Commodities and Global Markets group and Macquarie Capital is down in combination in terms of where we were this time last year as a result of that accounting issue coming out of the recognition of those transportation and storage contracts.

Some highlights from the quarter, starting with our largest group, Macquarie Asset Management. From overall assets under management you can see were up 2% on where we were in September, largely driven by market movements. When you look at the detail, strong performance coming through again for MIRA; you can see over $A7 billion of new capital being raised over the period and $A4 billion of capital actually being put to work over the period. $A3.9 billion of asset divestments came back and that actually went through to our clients. At the end of the period, we had about $A15 billion of capital to deploy.

MIM, you can see good performance in MIM. We've talked about that before, resulted in an award of $A4.6 billion of new mandates coming through there. We also note the continued growth in our infrastructure debt funds with the amount of commitments there at $A8.2 billion. As we as that, we're announcing in Europe this evening the acquisition of the real estate management company in Germany, about $A10 billion of assets under management.

Turning to Corporate and Asset Finance, largely in line with where we were in September in terms of the balances for the Asset Finance business. From a Principal Finance viewpoint, we note the number of realisations that took place during the quarter.

Banking and Financial Services, similar trends to what we've seen in the recent past, so that includes of course the stepping up in terms of our book of business, business banking being up 1% as you can see; funds under platform up 8%, largely reflecting of course good market conditions that we experienced over the quarter; the mortgage portfolio up 4% on the quarter. Deposits were flat on the quarter, we had seen them growing in recent years, but obviously with the opportunities out there, we've actually seen deposits remaining flat over the period. Also we note as well and we'll be talking a lot about it, the digital, the awards for our digital banking applications which are of course excellent.

Now turning the capital markets facing businesses. In terms of our Commodities and Global Markets business, there you'll see stronger results noted for our North American Gas and Power business. There was a lot of volatility in the other markets, in particular global oil and metals, and despite this lower volatility in foreign exchange and interest rates, we saw good client activity coming through our derivative activities, particularly in Japan and North America. In the equities market we saw increased turnover, which is actually flowing through of course to greater revenue to our securities business.

Macquarie Capital, again similar themes to what we've seen in recent years. Strong position obviously here in Australia, number one position; strong position of course in global infrastructure, we'll be talking about that of course a lot today; a number of other themes in terms of that infrastructure theme coming through that we see noted here. As well as that, you'll see the note to the DCM business in the US, that's going well. The overall activity levels, as we say there, strong levels of activity with 107 transactions being completed globally for the period.

In terms of staff numbers, our staff numbers are up on where they were. You can see they're up about 300 on where we were in September; Australia of course still our largest place of operation.

In terms of the balance sheet, you can see a bit of growth in the balance sheet taking place, and a bit of change in terms of composition of the balance sheet. So in terms of funding with those deposits being flat, you can see the increase in funding has come through on the wholesale side, so you can see short term funding and long term funding stepping up over the period. We were able to actually increase the amount of long term funding and extend the maturity of that long-term funding over the period out to about 4.5 years on average. You can see the use of those funds actually go very much into the trading assets in terms of the asset side of the balance sheet, so some growth taking place there from a balance sheet viewpoint.

In terms of our regulatory ratios, we've always had strong capital positions, strong regulatory ratios and of course no exception today. If we look at our CET1 ratio, 10.7% under the APRA measure of 13.0% on a harmonised basis, well in excess of regulatory minimums. In terms of our leverage ratio, 5.8% or 6.6%, again well in excess of the 3% regulatory minimum. Our LCR ratio of 153% versus 100%, well in excess of course and the net stable funding ratio of 109% compared with 100% being the requirement, so very strong regulatory ratios.

In terms of our overall capital position, you can see what's taken place over the quarter. We started the quarter with $A6.2 billion of surplus capital on a harmonised basis. You can see how the P&L obviously steps up, the profit for the quarter steps up, the amount of capital, lessened by of course the dividend that we paid over the quarter. As well as that, we had divestments; you will recall MQA was divested during December, which steps up the capital again and then you can see the business growth we referred to earlier actually using up $A400 million of capital together with movements in reserve. That brings us to about $A6.1 billion of harmonised surplus capital. Under an APRA basis, of course which we're regulated by, that comes down to about $A4.1 billion of surplus capital, a very comfortable capital position.

In terms of changes, in terms of capital regulation, obviously you will be aware that in December the Basel committee finalised its reform in terms of how to calculate capital under Basel III. Obviously APRA is looking at that and has said that it is going to incorporate it into its unquestionably strong requirements that it announced last year and actually will be telling us how it all works during the course of the year. That actually will be applicable to us on 1 January 2020 and of course where we sit today with the large capital position, we feel very comfortable we'll be able to accommodate any additional requirements that may arise.

As we mentioned before, we've got all the approvals necessary for a share buyback. That said, we didn't actually buy any shares over the quarter, but the approvals continue in place.

In terms of tax reform, obviously towards the end of last year we had tax reform in the United States. For the year ended 31 March 2018, we don't expect any material impact in terms of our tax expense within Macquarie. There are a few adjustments that will take place of course, but we don't expect any material impact there. On a go-forward basis, we expect our effective tax rate in the US to reduce by about 25%. In terms of the overall impact on Macquarie's effective tax rate, we see that in the 3% to 4% based upon our historic proportion of our income that has come from the US. So obviously in the future, the impact of that will depend upon how much US income we have compared with the other sources of income we have in the Group. But at the moment, looking on a historic basis, it's about 3% to 4% in terms of the change in the effective tax rate.

Now turning to the short-term outlook, as usual we've built it up from the Group viewpoint. This is the slide, you've seen very similar of course in terms of what you've seen before in terms of where all our groups see their short-term outlook. So starting with Banking and Financial Services, bottom left, you see the same sort of trends that we've been talking about over the while in terms of the growth of its books. Corporate and Asset Finance, as we mentioned before, the Asset Finance book is largely going to be flat over the quarter, as we mentioned, but the income change will come from the realisation that takes place in the Principal book. Macquarie Asset Management base fees we say will broadly be flat. Performance fees obviously will be determined in terms of the final outcome, very strong performance fees in the first half of last year, which we've said we don't - first half of this year, which we don't expect to see repeated in the second half of this year.

The capital markets facing businesses, from a Macquarie Capital viewpoint, obviously we've talked about the pipeline of principal transactions. From a Commodities and Global Markets business, obviously we're seeing an improved result in equities flowing through and we're also seeing lower impairments; we expect to see lower impairments flow through the book there and good customer activity coming through, notwithstanding the lower volatility that we mentioned earlier.

So bringing all those different group outlooks together, we expect our Group contribution, net profit contribution from the Group to be slightly up on where they were last year. In terms of the half-on-half comparison, obviously we highlighted before the very strong performance fees we received in the first half, which we don't expect to be matched in the second half and accordingly we expect our second half to be broadly in line with where we were in the second half of last year, rather than the first half. The effective tax rate we think will be broadly in line with the first half, which of course is lower than last year. Bringing that all together, we expect the Group result to be up approximately 10% on where we were last year.

Now that outlook, of course, is subject to a range of uncertainties that we can't control including market conditions, the impact of foreign exchange, potential regulatory changes and tax uncertainties, and of course a completion rate of transactions and the conduct of period end reviews.

From Macquarie's viewpoint, of course we've always talked about the medium-term and this slide is actually unchanged for many years, talking about how we see our position in the medium-term. As we say there, we feel confident we are well positioned to deliver a superior performance in the medium-term and that confidence comes out of our deep expertise in major markets and that's what our Operational Briefing today will be focused on. It will be focused on the expertise, as Sam said, in those three particular areas that we talked about before: in terms of infrastructure; in terms of energy; and technology. It's that strength of expertise that allows our business to develop and to evolve.

As well as that, that expertise is allowing us to do various cost initiatives, including in technology, of course, most importantly supported by a very strong balance sheet and as we mentioned, it's actually been enhanced over the period in terms of turning out of our debt and our strong capital position and most importantly, that the bottom line there, the proven risk management framework and culture that underpins everything that we do at Macquarie.

So the next slides I think you've seen before, there's no additional information. These are all based on the September results.

Now we're available to take questions before we turn to the in-depth view of our expertise. Sam.

Sam Dobson: All right, thank you Nicholas. So we'll open the floor to questions. We'll start with questions in the room and then go to the conference line. I would ask in the room if you can just wait for the microphone to come to you and I'd also remind you this is a briefing for investors, for the investment community, so we won't take questions from the media. If I can start at the back, Jon.

Question: (Jonathan Mott, UBS) Thanks, Jon Mott from UBS, just over here. A lot of the businesses that you've got are quite interest rate sensitive and given that you've seen bond yields back up quite a lot around the world and potentially going higher, can you just run through business by business how you expect this to drive the underlying operations? Even across the five business units and the sensitivities to interest rates that you're thinking about across the businesses?

Nicholas Moore: Look Jon, well we might actually, we have the Group heads here and they'll be presenting in terms of the Operational Briefing, so it's probably best to actually refer that question to them when we actually conduct the Operational Briefing on those various areas.

Importantly though, from an interest rate sensitivity viewpoint, the big issue of course is what's driving the step up in interest rates and if the step up in interest rates is being driven by economic growth, which obviously we've seen very strong economic growth, synchronised growth around the world, that's generally speaking a positive story from Macquarie overall, so talking about the overall story. Interest rate growth is a positive to Macquarie, economic growth has always been positive and so we're leveraged to that.

In terms of the impact of interest rate, it really is a business-by-business story and probably best to have the Group heads address that in terms of what the issues we're talking about shortly.

Sam Dobson: Brian.

Question: (Brian Johnson, CLSA) Brian Johnson, CLSA, congratulations on delivering 10% which I think not long ago was going to be broadly in line. Nicholas, when we have a look at slide 16, under Macquarie Capital and this hasn't changed from the first half, it's got solid pipeline of principal realisations expected.

Nicholas Moore: Yes.

Question: (Brian Johnson, CLSA) Macquarie's got a lot of money invested in that book in MacCap, I can't recall and even in the commentary today you've made on the division, there doesn't seem to have been anything really come through in this quarter, but it's still sitting there as guidance. Is that implying that we should expect some of these realisations before 31 March or are they essentially being deferred?

Nicholas Moore: Absolutely, Brian. I mean the realisations are taking place all the time, obviously we don't list every realisation. There's a lot of investments there, there's a lot of co-investments there, so yes, we are experiencing realisations, we will expect to see realisations between now and 31 March.

Question: (Brian Johnson, CLSA) Nicholas, the gain on those realisations, it isn't booked in one year, does it end up being booked over many years?

Nicholas Moore: No, the realisations, we don't book - we don't revalue that book, we basically only recognise the income when it's actually realised, so when it's sold or whatever happens to it, repaid.

Sam Dobson: Andrew, down the front.

Question: (Andrew Lyons, Goldman Sachs) Thanks, Andrew Lyons from Goldman Sachs. Nicholas, just a question on equity deployment opportunities within the MAM business; it's another quarter where you've raised more equity than what you've deployed. Can you perhaps just talk about trends you're seeing in markets and just the extent to which I guess elevated asset prices are making equity deployment more difficult at the moment?

Nicholas Moore: Yes, well better than me answering that, we have Shemara who will be talking shortly on infrastructure and that's probably a very good question to be putting to her. As you say, we have $A15 billion of dry powder in that infrastructure business. We've had a very strong quarter in terms of raising $A7 billion of capital and as you say, we did deploy $A4 billion, which is a very good level of activity, but $A4 billion is less than the $A7 billion, so therefore we've seen the amount step up. So it's a good position that we are in, but Shemara can address it specifically, I think, when we talk about infrastructure.

Sam Dobson: Up the back, Richard.

Question: (Richard Wiles, Morgan Stanley) Good morning. Richard Wiles, Morgan Stanley. Nicholas, why are you describing the conditions in the quarter as satisfactory? If you read the divisional commentary, sounds like Macquarie Asset Management was pretty good and Macquarie Capital was good, BFS was good, I mean what do we need to get for you describe the conditions as better than satisfactory?

Nicholas Moore: Well I think we all would agree it is satisfactory. I mean it's a use of words. Sorry about that.

Sam Dobson: Andrew.

Question: (Andrew Triggs, JP Morgan) It's Andrew Triggs from JP Morgan, just a question on the outlook or the commentary around base fees for in the MAM business, are said to be broadly in line with last year.

Nicholas Moore: Yes.

Question: (Andrew Triggs, JP Morgan) There was reasonable growth in this quarter to 2%, 2.5%, I think in the first half was up 1%, so just your thoughts around why we're not expecting a stronger improvement in base fees there please.

Nicholas Moore: Well these are broad comments we're making; I don't think we're being precise to the last decimal point. But I don't know, Shem, would you like to make a comment about that? I think just an approximation is all we're saying. Would you like to - I don’t know if you got that question Shem, we're saying basically we seem to be broadly in line with where we were last year and the question is given the assets under management are up, why aren't base fees up as well.

Shemara Wikramanayake: Yeah we had quite a few divestments in this period, so some quite large ones and I think Copenhagen, the Thames Water, etc, so that's why we're divesting at the rate we're investing at the moment and that's why base fees seem flat. We've got a lot of dry powder, as you say and that is actually getting invested quite quickly, so the last iteration of the US funds has been fully invested, we're raising a new one. The latest iteration of the European funds, about 50% to

60% invested and we hope to be having that full and raising a new one later this coming year. In Asia, we fully invested our last fund and have just raised a $A3.25 billion fund there, so that's why our dry powder is stepping up, but we're not invested in earning that yet and we did quite a lot of divestment.

Question: (Andrew Triggs, JP Morgan) Okay.

Nicholas Moore: I think the key thing is this, we're talking approximate numbers here, we're not being totally precise here.

Question: (Frank Podrug, Merrill Lynch) Thank you, Frank Podrug from Merrill Lynch. Before we go to the divisional heads, Nicholas, a question for you, what's the one opportunity that most excites you going forward and what's the one risk that most concerns you?

Nicholas Moore: Bit like the question about which kid, which of your children do you like the most. I mean obviously I like all these opportunities. I mean we thoroughly review them, we test them, there's always risk around all of them, but we do feel very good about all our different businesses and in terms of the areas we're focused on. One of the points that we'll make is we're talking about three particular themes today, but there are many other themes taking place in many other areas of expertise within Macquarie that we're developing, which could be very, very significant for us in the future.

So it's not to say these are the only three areas that we're focused on, absolutely not, there's a lot of other stuff that we are focused on. But these are three that we'll talk about in a minute, that feature prominently in people's minds, so let's talk about those three and we might have subsequent conversations on some of the other things we're developing.

Question: (Frank Podrug, Merrill Lynch) Two?

Nicholas Moore: Well obviously we, as you know from a risk management viewpoint, we look at all our businesses and all our assets on a worst case outcome, so well this is what we've got on our books, this is the activity we're running, what can go wrong here. In recent years obviously the risk for financial services has been very much on an operational or regulatory risk environment and that has taken a lot of effort and a lot of time for the industry broadly. As you know, we spend about $A400 million a year on compliance and getting that right. It's a risk that we are focused on.

Then of course you've got the normal market movements and valuation, as Brian was saying, with the assets of the book. We do spend a lot of time in terms of looking at our different books of business, whether it be the Macquarie Capital book, the Banking and Financial Services book, the CAF book. So a lot of time and we look at different market scenarios in terms of what can happen and we ensure that we are comfortable with the risks that we're taking.

We have a very simple approach that if we're not comfortable, we don't do it, because there's nothing in our portfolio of businesses that we have to do. We're only doing it because looking at the risk/reward equation, we think it is a good risk/reward equation. So we don’t do things for market share or we don’t do things for long term strategic drivers, it's very much driven by is that risk/return on that asset right. So we use risk and our risk management function is running across all our businesses constantly and actually doing that calculation to make sure we're comfortable with them.

Sam Dobson: Question in the front.

Question: (Tony Mitchell, Ord Minnett) Tony Mitchell, Ord Minnett. Can you reveal how much you've paid for GLL Real Estate?

Nicholas Moore: No, I don't think that - we can't release that number at this stage. Shemara?

Shemara Wikramanayake: It's not material to Macquarie Group.

Nicholas Moore: Yeah, Shemara's just saying it's not material to Macquarie Group and we're not releasing that information at this stage, that's right?

Shemara Wikramanayake: Yes.

Question: (Tony Mitchell, Ord Minnett) Can you make any comment about when you'll initiate the buyback?

Nicholas Moore: Yes, good question. I mean we obviously think about the buyback on an ongoing basis. We look at the opportunities we have to deploy capital and plainly over the last quarter we have deployed capital in the business and with an acquisition, so there'll be another deployment of capital. So it's weighing up the relative return in terms of what do we think we can be getting on the activity we have now and the activity we think we can see, the opportunities we can see in the short term versus buying our own capital back. So that's an active discussion that we have, an active issue that we look at continuously and it is very much weighed up, the way we do everything, on an incremental, deal-by-deal basis.

Sam Dobson: All right, we'll take one more question from the floor. Brian.

Question: (Brian Johnson, CLSA) Brian Johnson, CLSA, three sub-questions. With a change in the US tax rate, could you just refresh the currency sensitivity from Macquarie earnings? The second question was, can you give us a feeling how much the bank levy cost in this quarter versus the quarter before, having that it started on 1 July? Then I was wondering, Nicholas, like all the other commentary is much the same as it always is, but I was just wondering if you could fill out just one bit, just on the growth prospects for Macquarie? So that's currency sensitivity, bank levy over the last two quarters and your feelings on growth opportunities.

Nicholas Moore: Okay, well on the first two, I think we'll have to come back because I haven't got those numbers to hand. But broadly speaking, from a currency viewpoint, as you know, given the amount of overseas income that we have, 60% of our income is outside Australia broadly speaking, so that usually flows through. Now it does depend obviously on the profitability of our local businesses versus our international. Historically our international businesses probably have been more profitable, so it's not a precise measure, but if you think about that in terms of the usual split of income that we talk about.

In terms of the bank levy, I haven't got that cost to hand. We probably will have details of that in our full year results, so I can't talk about it.

In terms of the growth, Brian, what our presentation day of course is all about, the growth, we'll hear about our expertise we have and in particular how that expertise allows us to grow into adjacent areas and grow our businesses. So hopefully after today's presentation, hearing from the Group here to where the growth's taking place, you'll have a much greater feeling in terms of what the opportunities are for Macquarie in these three areas. As I mentioned before, importantly, there are a lot more areas that Macquarie is working on than these three particular themes that we're focused on. But hopefully our presentation is going to give you a feeling for how we go about looking at growth, how we go about assessing it and coming back to this idea of genuine expertise that these businesses have.

Alex Harvey: Brian obviously we have said publicly that the bank levy we expect to cost about $A60 million to $A65 million on an annual basis. I think that’s obviously the guidance we've provided and that remains the guidance today.

Sam Dobson: Okay, before I hand over to Nicholas, I'll ask our Group Heads to come up on the stage and join Nicholas and Alex will go back to the front row.

All right, with that, I'll hand over to Nicholas to run us through the rest of the presentation. Thanks very much.

Nicolas Moore: Okay, thanks Sam and this is a very good flow on from Brian's question in terms of Macquarie's growth and where's it come from. As we mentioned before, Macquarie's very much focused on the medium-term and people have often commented on the right hand side of this slide, of actually watching the business mix change in recent years, seeing the annuity-style income go from 25% of the Group to 70% of the Group, seeing international income step up, international staff step up. The question we often get asked is where's this growth coming from and the answer we give is largely on this page here.

So this growth is coming from the people within Macquarie, a very broad group of people who are actually very well connected with their clients and very well connected with the markets and so they're the people who can see the opportunities and lead the Group in terms of where the opportunities actually reside. So it's very much driven by that and of course it's people with deep expertise. So coming back to this slide we've used on many occasions, it's the expertise in the people and the outcomes that they're actually pursuing from areas of this deep expertise. Where we sit from a central viewpoint of course, we're looking to make sure that the use of the capital actually will be profitable and will be profitable on a long-term viewpoint.

So the corporate centre obviously provides that capital, provides that reviewing element and of course the risk management area of Macquarie is reviewing each category of investment we make, each business we make and making sure that it's satisfied that appropriate risk/return equation that we talk about.

Now the next slide is one hopefully people are familiar with. This is obviously a slide that we are proud of. This is our history from 1969, showing many years of profitability, indeed every year we've been in business we've been profitable. We think that is good evidence in terms of our risk management culture, but it's not just a question of being profitable and being careful, of course. What we highlight on this slide is the new activities that we've actually entered into. What we'd say is these new activities have all been very much driven off the expertise that we have within the Group and the ability of people to look from the areas of deep expertise into an adjacent area.

Now the next slide is the product of our annual staff survey, or biannual staff survey we do, where we actually ask our people where do you think the opportunities are coming from, you're the source of opportunities with Macquarie, what do you see? You've probably seen these slides before, the bigger the word, means the more often it's being used in terms of the outcome. So you see the theme for today's Operational Briefing in terms of where do our people see opportunities for the future. You see three big words obviously there, infrastructure, energy and technology; very important features for Macquarie.

Now why are our people seeing these as opportunities? Well obviously there's the big picture story and we sort of summarised a few facts here on this page that most people will be familiar with. Obviously the infrastructure story is a massive global story in terms of what's taking place out there. Urbanisation is taking place, we've got GDP growth happening, but urbanisation is taking place, a billion people are expected to move from the country into the cities over the next while.

So the growth of cities needs infrastructure; half of that we see probably taking place in Asia, but we do see very large spin taking place in the developed world and we break out there in the United States, obviously quite a lot of discussion in the US at the moment about the state of infrastructure, about $US6 trillion are necessary in the US between now and 2030. So overall, $US45 trillion needs to be spent. Most of that will obviously be spent by governments around the world, but there is a role for the private sector in providing that.

Secondly of course, energy; as the world grows, our energy needs continue to grow. It's a massive section of the global economy. We expect energy consumption to be increasing by 30%. But as well as that, we know in energy there's been a whole range of disruptions taking place. We've seen gas coming in and displacing coal and we refer to that in the slide here in terms of what's taking place and more recently obviously renewables are coming in to replace both coal and gas on an ongoing basis. The expectation of course is this momentum will continue and to accelerate.

Finally of course, technology, I think we all know about technology, we all live with technology in our pockets. It's changing our lives, it's delivering better outcomes, cheaper outcomes for us, in everything we're doing. Across our own business, we're investing very heavily in technology, we'll talk about that, but we're investing in technology so we can deliver much better outcomes for our customers across the board. As well as that, of course, our clients, all our customers are being impacted by technology. We're supporting the development as we'll talk about before, of customers who are building businesses in that space and also supporting customers who are impacted.

So now I would like to run a video with a whole range of Macquarie people around the world who will be talking about not just of course these big themes, but the expertise and this is the key word we're using, the expertise that Macquarie has. Because the fact that there are big trends happening, the world is interesting, but of course what actually does matter is what is our expertise in these particular themes, so we'll hear from some of our people talking about our expertise, starting with infrastructure.

[Video playing]

Nicholas Moore: Okay. That was quite a few of our people around the world working in this space at Macquarie.

The next slide you can see summarises our expertise, and as you said, there's a lot of number one there in terms of market position. Obviously, number one as you heard on the video and from Shemara in terms of asset management, number one in terms of this advisory business and also number one in terms of our infrastructure product here in Australia from the research viewpoint. You can also see on this slide the size of our teams and that was mentioned on the videos as well, 220 executives in the advisory business and over 500 in Martin's business focused on the management of these assets.

In terms of the history, most of you will know the history of Macquarie in this space; obviously, we've been going since the early '90s. What I find interesting on this slide is the bottom facts that have been broken out from 2012. We were obviously a very strong business in 2012 in that we would claim a number one position in asset management in advisory, but you look at our asset management portfolio back then, the equity was $A43 billion, today as you heard it's just a little under $A80 billion at $A79 billion. Transactions completed back then, $A18 billion; transactions completed last year, $A48 billion. Even though we had a strong market position then we've been able to see good, strong growth continuing to come through.

Now, what we'd like to do and what we'll see in these sessions is we'll do case studies that will actually - it will actually allow our group heads to talk about the expertise that we actually brought to different circumstances. You can see hopefully through that why that expertise is actually driving the growth of our business. I would like to hand to Shemara, who of course is heading our asset management business.

Shemara Wikramanayake: Thanks, Nicholas. Our approach in asset management is the same Macquarie-wide approach that Nicholas mentioned where our business is led by the expertise of our teams on the ground, and as Nicholas said, in the MIRA division that is a more than 500 strong team of specialists on the ground in 18 countries and more than three times as big as the next largest team. A lot of the leadership team have been together investing for over 20 years now.

We thought we'd start with a couple of case studies in the water sector to demonstrate how we deploy our capabilities and the first of those, Thames Water, that story started almost 20 years ago in about 2000 when some of our utility experts moved from Australia to the UK to look for investment for our first European fund and they saw a very fragmented water sector with more than 20 companies post-privatisation. So we started looking to learn about these assets, the regulatory environment, and eventually in 2003 were able to acquire South East Water and drove phenomenal returns for our investors in that asset over the three years until we divested it in 2006 to be able to be positioned to bid for Thames, which was the largest water and wastewater company in the UK.

Now, that was a complex bid because it was an £8.5 billion enterprise value and we had to put together and lead a consortium of 18 investors to get that done and post acquiring the asset we were appointed by all those investors to manage the asset for them. We put one of our people in as chief executive and we set about realigning all the management incentives to get them to really focus on the core operating business and driving outcomes in that. We divested some of the non-core assets, the offshore assets, and over the 10 years approximately that we held that asset, we invested more than £1 billion of capital expenditure in it, more than three times pre-privatisation and were able to reduce leakages by 22%, reduce injury rate by about 71%. Within four years we'd taken Thames from being the second worst-performing water and wastewater company in the UK to being top quartile on all the regulated operating metrics, including having the highest quality drinking water in the UK. In doing that, we delivered very solid returns for our investors.

Today, the other example that we had there on the slide, we're bringing this institutional expertise more to developing countries and we're looking there at an example in China, where in China, just the MIRA-managed assets today account for 800 million cubic metres of water consumption per annum. That compares to Sydney at 400 million and Melbourne at 250 million. Our portfolio is bigger than the whole of Sydney consumption today, but what's particularly appealing is that water consumption in China per annum is at one third of the rate of the US at the moment and the water rates are very low by international standards, meaning a lot of further capital expenditure needed and, particularly in certain parts of China where they rely on underground water and they really need to rotate around to higher quality surface water.

This example here of Shenyang Water is one where that happened. Again, as soon as we invested we set about realigning management incentives to focus on operational outcomes and we've now gone from 90% underground water to over 70% surface water. We've driven all sorts of other operational achievements like greater automation and bringing chemical processing in-house, which has reduced cost of chemicals by 30%. We see a lot more opportunity in utilities, not just water but electricity, gas, in all of the regions MIRA operates in to keep investing.

If we go to the next slide, we also thought we'd mention some of the non-utility assets here. We've used the example here of Copenhagen Airport because that was recently divested, generating a substantial performance fee for Macquarie Group investors, but it also is an example of what we do in a transportation sector where we invest in roads, ports, rail, airports. With Copenhagen, the story is very similar to the water one where in about 2000 we brought the

Portland Group into our team. They had big operational expertise in the airside and the non-airside. Since then we've invested over $A8 billion in 16 airports in nine countries, and these airports have over 100 million passengers going through them each year.

The sort of things we've done, which we did here in Copenhagen as well, is include on the airside things like developing new low-cost carrier facility, things like expanding the terminal, bringing new routes in and we saw passenger numbers grow by 45% in the period of our ownership at Copenhagen. That's on the MIRA infrastructure equity side. We're going into assets now of waste, communications, infrastructure, land titles being related ones, so constantly pushing the envelope driven by the capabilities of our teams on the ground by sector and region.

Then in infrastructure debt, also in MSIS, our teams there about five or six years ago identified the fact that banks were withdrawing from long-term lending and bond markets were too inflexible for borrowers, so spread started blowing out and it became an attractive place for our insurers and pension clients with long-dated liabilities to invest. It's a complex asset class to invest in in terms of shaping and structuring the investments and constantly having assets come close to covenants etc, it's a high touch investment class.

We've since invested in 50 loans for our investors and we are now the largest specialist infrastructure debt manager in the world as well with $A8 billion there and a team of about 30 people around the world in that. Then lastly, our MIM division manages about $A4 billion in listed infrastructure and was a pioneer in that space.

I think that covers a little bit of our approach in the fiduciary business. I might hand over to Ben Brazil next to talk about on the balance sheet investment side the approach we take.

Ben Brazil: Thank you. Thank you very much, Shemara. We've got two case studies that illustrate the two areas of operation of our business. Firstly, primary financing where we provide capital and financing to support new activities, and that's the Energetics case study on the left and then we have our secondary market investing where we invest in existing instruments and that's the context in which we've made our toll road investments historically.

Firstly, Energetics, which is a UK business we first invested in a number of years ago, which provides the last mile of gas and electricity infrastructure between utility trunklines and a newly-built residential house. The UK has an innovative industry structure where that particular piece of infrastructure, rather than being the exclusive domain of a local utility, has been opened up to competition. So Energetics and other independent providers compete, to the benefit of consumers, to provide that last mile of infrastructure, primarily to new housing developments. It's relevant that there's a real policy imperative in the UK to find ways to increase new housing supply, so it's great that Energetics is adding its efforts and resources to facilitating and supporting that new housing development. In particular, Macquarie's involvement has led to a significant increase in the scale of Energetics' activities. Since Macquarie became involved, we and Energetics have committed approximately £80 million to support the infrastructure for new housing development and we're now providing utility connections for about 16,000 homes each year. That represents about 8% of all new homes built in the UK, so that's great.

Our secondary market investing case study is a toll road in Denver called the Northwest Parkway. We acquired 38% of the debt in this toll road at material discounts to par or its original face value, primarily from the non-core parts of European banks who were looking to exit their exposures. The key risk we took on was traffic risk, and consistent with the macro and demographic trends of the market in which it operates, volumes performed very well. As a result, the owner of the equity, Brisa, was able to refinance the debt and pay our debt out at par, which generated strong returns on our investment, primarily as a product of the discount of inherent in our original acquisition.

I think the next case studies are Andrew's.

Andrew Downe: Thanks very much, Ben. In keeping with the infrastructure expertise in the principal and funds management businesses, CGM also has deep expertise in the infrastructure space and a long history. We have the number one ranked research team here in Australia and very strong underwriting and distribution capability which helps clients access the public capital markets. The first example here of Transurban, you can see is a company with whom we had a 20-year relationship, and last year we helped them raise $A1.9 billion, the largest capital-raising in Asia Pacific for an infrastructure company in 2017. However, CGM can do way more than just capital-raising.

The second example here is MGT, a 300-megawatt biomass power project in northeast England, when Macquarie's first method development teams had a lot on their plate. They needed capital to progress the design and development plans and then they had to tender and close half a dozen commercial contracts as well as raise $A1 billion in term project finance, all of which needed to be done within 12 months.

How did we help them? First of all, we provided them with the development funding but moreover, we worked fulltime with the management team to tender and negotiate a suite of bankable commercial contracts, no small feat, on a plant which is a world first in terms of construction scale and fuel requirements. There were many risks and challenges that needed to be overcome.

Firstly, the fuel supply needed to be secured and when all the major European utilities withdrew from the tender, using the expertise of our commodities team we arranged a 15-year wood pellet supply contract from North America. This of course then issues another risk of currency exposure, for which we executed a longer foreign exchange hedge. We had to deal with the construction and contractor risk and when the initial contractor went insolvent just a few weeks before close was due, we negotiated to buy the design plan, retender the contract and then put together a consortium of two construction companies to deliver a bankable solution.

Another risk was how to construct a power purchase agreement given there was no precedent for the UK's contractor difference for biomass projects. Using expertise of our power desk in the UK, we developed a PPA for the project from scratch and committed to a 15-year transaction. Then after all that we had to deal with the risk and ultimately the reality of Brexit. We identified, evaluated, priced and managed risk perceived as a result of that decision, including a 15% decline in the pound, and managed to get around 30 commercial and financial counterparties comfortable. The end result was that we secured the required capital and closed the project two months after Brexit.

This project was a joint effort between CGM and MacCap and Tim, I think it showcased the combined capabilities of the Macquarie platform.

Tim Bishop: Thanks, Andrew. Yes, Macquarie Capital and CGM do lots of transactions together across infrastructure and ECM and it was a great example of one of our best. Infrastructure is the biggest business within Macquarie Capital, it has been over two decades in the making and is something that we're very proud of. We have over 220 transaction executors globally who specialise in infrastructure. From a client advisory perspective, we are the global leader. We were ranked number one in 2017 globally, advising clients on just shy of $US50 billion worth of deals. MIRA remain a very important client of Macquarie Capital, we have a very close working relationship with them.

We also have deep relationships with the largest infrastructure funds and sovereign and pension funds globally, and in 2017 alone we advised or financed around 80 separate clients. I think one of the unique characteristics though of our infrastructure business is that we have a combination of traditional corporate advisory bankers who sit alongside our in-house technical and engineering and operational experts and they really help us assess risk and opportunity in developing and constructing infrastructure assets.

Look, we very much see Macquarie Capital's role as helping to create assets through both the development and construction phases. We actively use our balance sheet, providing equity into sponsor and a developer. Importantly, we understand the needs of governments and communities to meet with their growing infrastructure demand and we have deep relationships with the global construction companies and operators. Today we currently have about $A10 billion in infrastructure projects under construction or development globally. Governments trust us to help them deliver on their needs for infrastructure.

I would like to just quickly highlight two transactions as outlined on the slide. The first on is the Blankenburg Tunnel in Rotterdam. As the majority sponsor, Macquarie Capital led the consortium and all of the government interactions. This is a complex five-year construction program with roads and a tunnel. Importantly, the reason we won was the quality of our submission, not price. We led all of the technical and engineering seminars to achieve the best development value, and we also took learnings from other PPPs that we've participated in to provide an in-house maintenance solution which created additional value for us.

Secondly, in Mexico we have acquired Norte, which is a combined cycle gas power plant in Mexico. The complexity here was that we stepped into a partially-constructed plant which was experiencing major delays and running out of money. In what was a very complex transaction over 12 months, we again leveraged this combination of banking skills and deep operational and technical skills. We appointed a new contractor on a partially-constructed asset, which is quite a challenging proposition. We brought in GE as a new operator. We navigated quite complex insolvency proceedings in Spain and Mexico, and fundamentally, we raised the financing for the project, a combination of non-recourse debt and then use our own balance sheet to acquire the majority of the equity. That asset today is now a very attractive asset to the market for the more natural long-term owners of infrastructure assets.

In summary, in terms of our infrastructure business, from a client perspective we are the global leader in infrastructure advisory, and secondly, we are unique in that we have deep engineering and operational and technical skills that really enable us to use our balance sheet to help develop infrastructure assets globally.

In terms of what's next for our business, as you've heard earlier, that there is $A200 billion of dry powder to invest in infrastructure assets globally, and that's combined with a huge demand by governments to upgrade that ageing infrastructure. The challenge for us is to connect that capital with those deals, and again ideally we're doing that at the early development stages of the assets where we can really create value.

Shemara, what's next for you in infrastructure?

Shemara Wikramanayake: For us, I guess there's three things I'd mention. One is continuing to raise and deploy the regional funds, which is how our model has been. I mentioned earlier that we are getting the highest levels of raising, each of our funds is a record-breaking size in the series at the moment, which is showing a little bit what's going on in the broader sector but also the trust and support that we have from our investors.

Secondly, we're starting now to at this point of the cycle see investors barbelling where their interest is in investing. There's a lot of interest in super-defensive assets and we are raising a series of funds called the SuperCore infrastructure funds that are investing in very defensive utility-type assets. At the other extreme, in our core funds we're having to be more proactive and do more complex transactions; take privates, breakups, restructurings to drive value. So I guess that's the other feature.

Then the third thing we're noticing in the infrastructure equity is that last year we generated $A15 billion of investment opportunities, to the question of our investment opportunity in the current market, but only $A6 billion of that was done by our funds. We're generating a lot of investment opportunity and we're starting to put together separate managed accounts for our larger investors who are evolving to wanting to invest asset by asset on a discretionary basis and organising those to putting investment into funds. Then of course, we're continuing to grow the infrastructure debt business.

Ben Brazil: We're expecting a continuation of our bias towards bespoke and less-liquid situations away from the vanilla, more liquid instruments, albeit we're always positioned to take advantage of any volatility in markets or asset prices to the extent that does emerge. Andrew?

Andrew Downe: For CGM there'll be significant opportunities as the private sector plays a greater role in infrastructure over time. There's clearly a very significant investment in infrastructure acquired, some of which will continue to be supported by government. But increasingly we think the private sector will be asked to step up and markets will need to price and source both risk management product and capital. In the case of MGT, which we highlighted earlier, that involved foreign exchange, fuel supply, power marketing contracts as well as interest rate hedges, which of course will become way more important in a rising interest rate environment.

With infrastructure investment happening around the world, an increased need to access global markets to source suppliers of construction imports or term contracts for fuel supply or even investment capital, CGM is well placed with capabilities in all the major markets to source and supply physical contracts, with management products that ensure consistent returns for asset investors rather than volatile merchant returns. This in turn should assist with raising efficient capital for each of the assets.

Sam Dobson: Thanks, Andrew. We'll pause there for any questions. We'll take questions from the floor, and as before we'll then go to the line if there are any questions there. So, Frank?

Question: (Frank Podrug, Merrill Lynch) Thanks. Frank Podrug from Merrill Lynch. Shemara, a question for you. Firstly, congrats on $A7.1 billion, it's a phenomenal result. It's more than you did annually for many years. It's a question on industry structure and return sustainability in the future, it creates an attractive space in infrastructure but that's attracting competition. So Blackstone seeking to raise $A40 billion, half committed from the Saudi Public Investment Fund, KKR, Carlyle, Apollo, they're all making noises about wanting to be there. How do you feel about return sustainability?

Shemara Wikramanayake: Yes. Look, infrastructure is a space that's actually growing structurally in terms of both demands for investment, Nicholas showed statistics showing there's $US45 trillion of investment needed after 2030, half of that in Asia, and also in terms of demand for investing, we heard Joe Spillane talk on the video about just one investor who'd made a $US65 billion allocation to this space recently. Even though more players are coming in, the asset class is growing a lot and we think it's a space where we are the largest player by a margin.

As I mentioned, it's really important to us that we maintain that by keeping our track record up with the active asset meeting, delivering outcomes for investors so they keep reinvesting with us and delivering outcomes for communities, as you saw in all our case studies so that we keep getting entrusted with assets and we can stay at the front of that curve. But we may have a smaller share of a much bigger industry but we'll probably still for the next few years hopefully maintain the biggest share of anyone and we will in absolute terms have good potential to keep growing I think. Does that answer your question?

Question: (Frank Podrug, Merrill Lynch) Great.

Sam Dobson: Craig.

Question: (Craig Williams, Citi) Craig Williams from Citi here. The Trump administration seems relatively nationalistic in its approach to diplomacy. Does that make life any more challenging for Macquarie Group as an advisor and investor in terms of accessing opportunities in the US?

Nicholas Moore: Well, it hasn’t so far. We've been carrying on business in the US both as an asset manager and as an advisor for many years now. As you heard on the video, there is nothing but enthusiasm in terms of the prospects there in the United States. We haven't seen any evidence to the contrary at this stage.

Sam Dobson: At the back, Brian.

Question: (Brian Johnson, CLSA) Brian Johnson, CLSA. A question for Shemara. Shemara, up until about three days ago I think we were in a world where bond rates were always going down, asset values were always rising, but I was just wondering, can you talk to us just about this inflation versus the ability to lift the economic rents on the infrastructure assets that Macquarie holds?

Shemara Wikramanayake: Sure. We've actually interestingly done a few pieces of work recently for our investors which we're happy to share with anyone who wants, in terms of how infrastructure performs as an asset class in periods of rising interest rates and interest rates being driven by different things, when it's GDP growth, when it's inflation etc. Some people may be surprised to see that in periods like the one we're in at the moment, and Nicholas mentioned this, where the interest rate increases are actually being driven by increasing synchronised global growth, infrastructure tends to perform more strongly in absolute terms than it does in periods where there's less of that.

You shouldn't actually be surprised because a lot of these assets are inflation-hedged where utility assets have their rates set taking account of what's going on with inflation and the patronage assets really benefit as GDP growth increases. So whilst discount rate may increase, actually the asset cash flows typically increase faster because if you've got your revenue line growing at a higher rate in a business with very high operating margins, your profit line is growing at an even higher per cent. So we find typically it's been a good cycle for us, and I'm very happy to share all that research that our MIRA research team are now doing.

Nicholas Moore: It's important to note, I assume that it's all historic, it's all backward-looking. None of us of course know the future, but there's a lot of evidence in terms of how these assets have performed at different periods of the cycle.

Shemara Wikramanayake: We've gone back several decades and looked at similar cycles, but as Nicholas says, each one is new.

Sam Dobson: Richard.

Question: (Richard Wiles, Morgan Stanley) Richard Wiles, Morgan Stanley. Shemara, a couple of questions for you, please. Firstly, I think on one of the slides you - slide 30 you say that around $A18 billion of EUM was in Asia. I assume that's $A18 billion of the roughly $A80 billion that sits in MIRA?

Shemara Wikramanayake: Yes.

Question: (Richard Wiles, Morgan Stanley) What are your expectations for growth in opportunities in the three regions? Do you think Asia grows more quickly than the US and Europe and do you think that the Trump administration will accelerate the opportunities in the US?

Shemara Wikramanayake: Yes. Look, we think we see a lot of opportunities in all three regions, particularly for the size of manager we are in those regions. We're a small per cent of the flow of investment happening. We are very excited about Asia, so Asia is probably a higher-return but higher risk region to invest in. We've been on the ground there for nearly two decades now. We've had - our teams are across Macquarie Group 98% localised, so our South Korean team have been there since the late '90s, all South Korean; the Indian team are all Indian; the Chinese team are all Chinese.

We have done a lot more I think than any other managers in Asia in identifying investment opportunities, shaping them, de-risking them, building credentials so that as money starts to flow there we'll be very well positioned to stay at the fund. Having said that, Europe is the market where the biggest volume of infrastructure transaction happens today, and I mentioned the bar-belling earlier, we're doing a lot of utility investing, so we had National Grid and the Finnish Elenia asset recently that we bought in our SuperCore fund. Then we're investing in areas like eastern and southern Europe more, so we see a lot of opportunities there.

Coming to the US and your question also about Trump, we certainly - we've just invested - our last fund very attractively bought assets like Maher Terminals recently and Cleco, the listed utility. Again, we have enough assets to invest. I think the Trump administration is very keen to see greater investment in infrastructure, but as you know, the infrastructure assets are all owned at the state and local municipality level and that's where you really need to accurate growth.

I think what the Trump administration is talking about is doing what happened in Australia, which is an incentive program from the Federal level to encourage more state-level investing. I think he's talked about $US200 billion to encourage $US1.5 trillion of assets. I lived there; 2004 when I first got there, 14 years ago, we spent a lot of time with our colleagues in Macquarie Capital and across the grid talking to state and municipalities about trying to unlock the dam of public sector investment. That journey still continues.

I think the availability of muni bonds has made it challenging because the public sector has alternative funding. The US infrastructure needs a lot of investment as we all know, and I think Nicholas your statistics were $US6 trillion for upgrading US infrastructure. Some day that dam will have to break but at the moment we have enough to feed us in terms of growth. So I guess the answer is we see our teams on the ground in all three regions are enthusiastic in getting their funds invested.

Question: (Richard Wiles, Morgan Stanley) Okay, thank you. Can I also ask about more airports business specifically? You've had a lot of success in the past. Can you tell us what you've done in Asia in the past and whether you see Asia as a growth opportunity for your airports business and particularly whether you've tapped into growth in airports across China?

Shemara Wikramanayake: Yes, we are. Look, in China to date we've been investing more in things like water treatment and wastewater, as we talked about. The opportunities haven't come up scale yet, but they will be huge when they do. We looked at the Japanese airport that we've just privatised and there's a second one coming. So, we've done smaller airport investments across Asia, but none of the big ones have come through yet. But you know, as I've mentioned in the case studies about more to the deep operating expertise we've got in airports we would really love to bring to operating Asian airport trend. That's an opportunity for the future.

Sam Dobson: In the interest of time, we might pause there, and we can circle back at the end for any other questions. Before I hand over to Nicholas we're moving on to the energy section of the presentation now. We do have another short video highlighting our staff in the sector as well.

[Video playing]

Nicholas Moore: Okay, well that was a lot of our people you heard talking about our expertise. As we know energy is a massive sector. It's a sector that is changing. You've heard about the change from coal to gas obviously we've seen in the United States, and of course the green change taking place now globally is very, very significant.

In terms of the Macquarie people, we've going to hear from the group heads as we've had before, but you can see on this slide, some of the big numbers in terms of who we are and what we're doing, obviously in terms of the growth of our energy business, are very much driven in terms of where commodities and global markets grew the business from in the early 1990s, therefore that's very strong position in gas, in power, in North America which we highlight there with that number two position that we have in North America.

In terms of the other divisions, we can see from a Macquarie Capital viewpoint, obviously the strength on the traditional advisory side of the business, but increasingly the development of this green energy initiative around the world. Obviously, the acquisition of the Green Investment Bank allowed us to step up our expertise in that substantially in Europe, and it's very, very active across the globe.

Asset management of course, as Shemara's team has been very, very active, and we detail what we're doing there. In terms of Corporate and Asset Finance, we've seen the opportunity in terms of the meters, but obviously as you've heard on that video we're growing to a whole range of other sectors as well.

With that I'll hand over--sorry I'll just go to the next slide just in terms of the timeline, talking about the summary of that. Again, on this timeline you can see the point in terms of where we were in 2012 and how the business has grown since then, even though we had very substantial businesses back then, you can see the underlying growth taking place on that slide.

Now, I'd like to hand over to Shemara to take us through asset management in that space.

Shemara Wikramanayake: Thanks Nicholas. I've mentioned when we talked about infrastructure how we're having at this point in the cycle to find more complex valuating transactions to deliver superior return for investors. That's very much the case in core energy utility. So, we thought we'd talk about this Viesgo example of an example of where we're pushing the envelope and doing something more complex to find returns. This asset was owned by E.ON SE, the German utility, and they were spinning out their Iberian business. One of the big things E.ON SE wanted was limited impact on their wider business.

So, complex transaction for many, many reasons. It was a €2.5 billion asset. It involved not just distribution, but a lot of generation in both conventional and renewable energy.

The Spanish electricity market had gone through significant reform and that was challenging for a number of bidders. Then importantly as I said, E.ON SE wanted a clean lift out, so someone had to put in place a risk management function, the finance function, the IT function, and the fact that we had done this with E.ON in 2012 when we bought the backbone German transition infrastructure Open Grid from them gave them confidence we could deliver doing that after we just bought Wales and the West in the UK some years earlier and done the same.

So, we were able to basically dedicate a team of over 25 of our staff throughout this acquisition, and then after the acquisition through the integration and transition process, and within a hundred days we had the business rebranded from E.ON SE, and it now runs with its own liquidity management, health and safety functions, all of this replaced and running, including assistance from our colleagues in CGM on the energy trading side.

So, that's the sort of thing we're doing in complex transactions in energy. We also, I wanted to note, in this renewable example, have been looking at the renewable space long before it was fashionable. So, this is back in 2005 in our first European fund, we invested in biomass and landfill in the UK, in solar in Spain, in wind in France, and delivered excellent returns to investors out of that portfolio.

So, going to the next slide, that all came together when a few years - sorry this year this happened. We bought EDC in the Philippines in 2017. Now we not only used our complex transaction expertise and our knowledge of renewables, because this is the largest geothermal asset in the world, but we also used the experience we developed in the Philippines here.

So, to Richard’s question about local expertise in Asia, about five years ago we, together with the government pension plan in the Philippines, set up a $A600 million dedicated Philippine fund. We've done six investments in that, but we got to know the local market and players very well. First Gen, who owns 40% of this listed company then became very comfortable with us following other experiences together to do this 47% tender offer for the listed company. That was the largest tender offer in the Philippines, and the largest in the power sector in Asia, and driving very good value for our investors.

So, in the renewables theme I thought I had to mention because it was also a recent thing last year, the Green Investment Group investment. Now, that was led between us and Macquarie Capital, and we were uniquely placed. It required a whole of house approach that really only MacCap could lead a consortium to put together. We bought this for £2.3 billion.

Before I hand over to Tim to give you all the colour on that very complex process that we were able to successfully close, I'll just mention in asset management we have now a £1.1 billion offshore wind fund, and a £200 million fund with the UK government to invest in renewables in developing regions, which has done the first investment in India in that.

The most appealing for us is we were able to bring a team of experts in to add to our already deep bench renewables and help us keep growing.

I'll now hand over to you Tim.

Tim Bishop: Thanks Shem. As Nicholas and Shemara have highlighted, we have been a material participant in the green energy space for a number of years. The acquisition of the Green Investment Group is another step in that evolution. All be it a material step, but something that we're very excited about.

The UK government trusted us with their creation at the world's first Green Bank and we were willing to commit to invest more in the future, and not only maintain GIG, but to grow it.

I would say that Macquarie was the only one that had the technical and financial expertise to do due diligence on the 40 separate assets in such a short timeframe ranging from debt, equity, investment in funds, assets that were relevant construction and operational.

Since acquiring GIG, we have integrated the team, lent over £1 billion in green investments, and expanded GIG beyond the UK, and particularly in Europe and Asia.

From a transactional perspective, green energy is growing faster than infrastructure, and it now accounts for over 40% of infrastructure deals globally. Consistent with what you heard me talk about earlier in infrastructure, we at Macquarie Capital really see our role as combining our balance sheet, and external partners with our deep in-house technical expertise to help create assets. Again, as the developer and all through the construction phase.

We have over 130 transaction staff with 80 of them having engineering, technical and operational expertise in renewables.

Today Macquarie Capital have under either development or construction over 10 gigawatts of renewable energy globally. Approximately 7 seven gigawatts is in offshore wind, and that will require about $US35 billion of funding to be sourced. The balance of about 3 gigawatts is made up of solar, our onshore wind, waste, and biomass, and that will require about $US6 billion of funding.

Importantly in Asia alone, we now have approximately 3.5 gigawatts under development or construction, and that is from basically zero only three years ago.

Fundamentally, we believe their real insight is that it's helping to turn green energy into an acceptable asset class for institutional investment. We have insights into new technologies. If you take offshore wind, say only five years ago, this was not really an asset class that was institutionally accepted, and we've helped make that transition happen through our technical expertise and our infrastructure heritage has been able to de-risk our projects.

You heard from Jack Doh from Macquarie Capital in Korea on the video earlier, in how we're doing the same thing today in the waste industry in Korea through eternity contracts and creating stable cashflows. We're now looking at new technologies like floating wind farms, and floating solar energy, and how we can de-risk those new technologies.

We've also been active in the oil and gas space. I particularly want to highlight the acquisition of Quadrant Energy in Australia. I'd like to make two points here. Firstly, we worked with a very long-standing client and relationships of Macquarie Capital. Apache was the seller. A great client of ours. We knew that they wanted to dispose of the asset, and we've been thinking about how to help them on this for a number of years.

Brookfield, and Wesfarmers, again fantastic longstanding clients of ours who we brought in as our partners and really putting our balance sheet alongside our client and our advice to create real alignment of interest.

Finally, Alcoa. Again, a longstanding relationship dating back to 2004 where a deep understanding of their energy needs, and this resulted in Quadrant entering into a long dated gas supply contract with Alcoa giving them security of energy supply, and giving Quadrant long term stable cashflows with a credit worthy party.

The second point I'd like to make is bringing up infrastructure mindset to this asset. A good example of that was when we restructured the Varanus Island gas processing plant, and we introduced a long-term framework for gas processes for both Santos and Quadrant through the introduction of a tolling mechanism. More broadly we're driving a whole of asset life philosophy to the Quadrant business.

We sit on the board of the asset. Kate Vidgen, who was on a video earlier from Macquarie Capital is chair of that asset, and we remain actively involved in the management of this investment. We're excited about additional growth and investment opportunities for Quadrant.

Our overarching objective is to create stable cashflows and to de-risk the asset. We were able to achieve that on a gas front through the Alcoa contract. On the oil side, again we were able to work with Andrew Downe in the CGM team to provide a hedge. This is obviously a core business for CGM and part of a larger energy business, and again another example of the joint work that goes on between Macquarie Capital and CGM.

Andrew Downe: Thanks Tim. That's correct. CGM's expertise obviously in energy does, and risk management products, but it goes beyond that fiscal capability and capital markets across the globe allowing us to offer risk and capital solutions for clients such as the first example in these slides of the Heide Oil Refinery, and petrochemical complex located in northern Germany.

When Heide's providers of working capital as well as their suppliers and offtake of physical products, all failed, we were able to partner with Heide to really understand their business. Under our relationship with the parent company Klesch, our respective teams worked together day-to-day to operate the refinery, optimise the refinery's capital structure, and overlay an efficient risk management structure.

We entered into inventory monetarisation transactions that involved us procuring a cargo of crude every week – destined for the refinery, and buying and selling refined product on a daily basis to balance the refinery's production and sales requirements.

To accomplish this, we are dealing not just with generic crude oil, but rather 30 different products and grades on location in northern Germany. Then more strategically, we entered into bespoke long-term refinery margin hedges, how to track the actual real physical refining margin of the specific refinery.

Of course, none of this would be possible unless we had the people expertise and product capability across the spectrum of physical supply and uptake bespoke to revenues and capital solutions covering all the different geographic regions.

The acquisition of Cargill Petroleum in the North American power and gas business has continued our build out of our physical capabilities and, in the case of Heide which is to supply and market specific products with particular specification location and delivery schedules. The people have added to our geographic capability and increased our insight into very particular supply and demand situations.

All of this gives us more people, more expertise, to provide clients with solutions that combine capital, risk management, and physical contracts.

Garry, I think this being people and expertise extends across to CAF as well.

Garry Farrell: Thanks Andrew. I'm going to tell an interesting Macquarie story. It's basically about in all our businesses starting small and growing as we learn things.

So, Macquarie Capital is working with large issuers in the UK that wanted to drive costs out of the ownership and provision of meters in the UK. Meters went off the regulated asset base to make this transaction possible. They tendered UK into seven regions and MacCap won one of the sectors in North London, East Anglia. We stepped into the contract. What is important to remember is we just had a contract. We had two people with industry experience both with substantive systems, processes, or refurbishment centre.

We immediately started recruiting from the industry, whether it's utilities, manufacturers, etc, to get that key experience which makes a difference in assessing credit risk and asset risk. We invested heavily in refining the processes and setting up a logistics and refurbishment centre in the middle of London which is quite unique and quite unusual in today's UK metering environment.

We started slow. The initial contract was probably £100 million being installed over two, three, four years. We were happy with that. In about 2006, we were thinking about smart meters coming into the market. Ultimately, coming in the residential space so we had to get our mind around the particular risks and rewards.

We started working with commercial enterprises to fund smart electricity meters. As you can see from the slide, we've been relatively successful with about 600,000 installs. Becoming more involved and with our risk management framework, understanding of it, we approached National Grid which own the on-stream portfolio. Now, this was a traditional meter portfolio, not a smart meter portfolio. We persuaded them to sell it and it basically trebled our books. We had immediate scale.

We started, like most Macquarie people, moving into adjacencies, so, funding distributed power, storage, energy efficient assets in the UK and Australia. More on that in a subsequent slide. Now, the UK government in 2015 mandated the compulsory roll out of smart meters for consumers. So, the smart meters were coming.

More or less in what we'd envisaged a few years earlier when we bought the National Grid portfolio. We've been relatively successful winning to install about nine million residential smart meters in the UK. So, what we're particularly proud of is we're touching six million UK homes and commercial enterprises providing meters which are the cash register of the industry.

Now from a relatively small matter in a home, to a much larger asset on a roof in the UK, Ben what are you doing?

Ben Brazil: Thanks Garry. So, Principal Finance recently developed really from scratch a portfolio of residential rooftop systems in the UK, totalling around 13,000 individual systems. These systems were provided to the home occupier at no cost and in fact, delivered free electricity to that occupier during the period of the day when the solar panels were operational. So, very compelling offering. It's supported of course, and made possible, by the UKs carbon emission reduction scheme. Our portfolio helps avoid around 11,000 tonnes of emissions each and every year.

As well as that, we also saved UK households sort of £3 million plus in electricity bills each year. The merits of the offering needed to be sold, and the systems needed to be installed pretty much rooftop by rooftop. You know house by house. That's where the entrepreneurship of our team really came to the fore.

Having developed the portfolio, we were recently able to exit it to a long-term infrastructure owner, and generate great returns to our capital and to our efforts.

So, that's a great story of taking an opportunity all the way through its lifecycle from the very beginning. But unfortunately having now realised the investment we have to look at ourselves and ask what's next? Fortunately, we've recently gained some traction in a not dissimilar program in the UK to provide battery storage often aligned with industrial scale solar to industrial users. We're hoping that in future years that will be the sort of success that we discuss in a forum just like this.

Garry, what's next for you?

Garry Farrell: Well, three key things really. A shift into distributed power. You can see 30% of energy consumption is increasing by 2030. Another statistic which is not on the slide is that by 2020, 42% of world power will be distributed about $A200 billion per annum. That's an enormous opportunity. Distributed power could be solar, batteries, CHP, wind, small scale gas and diesel, on and off grid. So, a fundamental opportunity.

The second opportunity is the connection. Because of miniaturisation, digitalisation, and internet of things, all devices are becoming connected. From that simple smart meter with an IC in it and a communications device through to a phone, through to any device in a home, a fridge, a pool pump, they're all being connected, and monitored, and measured. So, we've been working both in the UK and Australia through the retailers, and some of our major introducers and developers to basically fund those assets in smart homes and smart businesses. The opportunities are endless.

We've been working in Australia about microgrids, probably in the retail sector. So, actually working with one of the major retailers to finance about a thousand homes, solar panels on the roof, and batteries to go off grid. You can see increasingly battery storage commercial enterprises. We've been involved in funding those with the manufacturers and those customers.

Load shedding. That means many things. The consumer sector could be as simple as turning off your pool pumps at certain times during the day to cut load on grid, or alternatively dialling back the air conditioners. This can all be done with increasing connection of these devices linked by ICs, demand management and so on.

The final thing is the shared economy which I'm really most excited about. We've been in business financing and leasing assets for some time, and traditionally finance the ownership of an asset. We've been trying to convince customers they don't need to own the asset, just need to be able to finance the use of an asset over a period of the assets life cycle not the full lifecycle. Very important to drive extra returns from the business.

So, there's some very large statistics here about that sharing economy. It could be a managed service contract. One of the structures we are looking at, and the deals we've executed over the last two or three years is particularly in Australia which would drive the point. But rather than be paid on a pound per use, or dollar per use, you're paid based upon the savings. The energy savings, or the savings in where the industry your assets involved in.

So, we're with the manufacturer and a major retailer and the customer. We've been involved in installing solar panels on the roofs of factories around Australia, LED lighting in those factories. It's been a win-win for all three people. Such that Macquarie is being paid based upon use, but based upon energy savings. That style of transaction will be fundamental and it's really just a wave of opportunities coming through us.

So, now I'd like to finally hand over to Shemara and just see what's next in your world please Shemara.

Shemara Wikramanayake: Thanks Garry. So, energy has always been a big part of our core infrastructure investing in the equity and debt side. I think about half of our assets really in infrastructure assets are involved in either generation or reticulation of energy. So, we'll keep investing more in energy. That's partly because of the demand for new build. We've got an AIIB stat here that says that there is $US18 trillion of new investment required in energy in Asia alone in the next two decades, but also potentially if there's a cyclical rotation in listed equities the way some yield assets to more growth ones, it could mean there's opportunity as well to invest in developed marketing listed assets. So that's in our core funds but also the other thing that's quite exciting is we're looking at a new initiative which is putting our toe in the water in upstream energy funds, which is a bigger space than infrastructure and we've had a team from Andrew Downe’s business in CGM move across recently into the asset management business, bringing with them 15 years of experience doing 85 investments, I think, Andrew at $US4 billion in upstream oil and gas investments where they're doing development delineation of projects.

So they just come across to us and we're thinking we can take that out of the fiduciary offering to our investors. We think there'll be a lot of interest in that. We're clearly going into a very big, established space, but we think their track record should position us to start raising funds for it. So with that, Andrew, I might actually hand back to you to.

Andrew Downe: Sure. All of CGMs businesses are really geared around adapting to change. For energy, not only is the world's demand for power increasing, but the way we produce, store, and consume power is all changing. In just a few years the US has gone from an importer of gas to an exporter. What does this mean? Well, it means new pipelines are having to be built. Old pipelines are reversing direction of flow. So, for example, the north-east of the US used to be a net importer of gas. Now it's a net exporter of gas. Terminals that were originally built to import LNG are now being reversed to export LNG.

An example of that is the Freeport terminal which started off as a relationship on the trading side between CGM and Freeport, but subsequently became a client for MacCap who arranged the significant development finance to convert the terminal to an export terminal. With the growth of renewable energy and demand to reduce environmental impact of traditional fuels, clearly gas fired generation which can step in at short notice when the sun doesn't shine or the wind doesn't blow has growing importance which bodes well for our position as the second biggest wholesaler of gas in North America.

We see this continued fundamental change in the energy markets driving increasing client demand for capital and risk management solutions. Tim, what about you?

Tim Bishop: Thanks, Andrew. For Macquarie Capital, what's next? Three things: firstly, understanding new technologies in green energy, battery storage being a very good example of that; secondly, again, in green energy new markets with a particular focus on Latin America; then, thirdly, gross percentage increase convergence between conventional energy producers and green energy players, and making sure that we're part of that convergence. Thank you.

Sam Dobson: So we might move straight to the technology section and we'll save the questions to the end of the briefing for energy and technology. Moving into technology before I hand over to Nicholas, again, we've got another short video highlighting our expertise in the technology space.

[Video playing]

Nicholas Moore: Look, quite a few of our people around the group - and as you can hear, technology is impacting all our businesses and all our clients' businesses. Obviously, the sections we had before in infrastructure and energy are similarly being impacted by technology. As a group we're spending about $A1 billion a year on technology. A very big spend, and we are delivering better, faster, cheaper outcomes for all our customers we're dealing with. From a wholesale business we'll hear about the impact it's having. It's allowing us to process a lot more transactions at a lower cost than we've done before.

From a retail viewpoint - we'll hear shortly from the team - it actually allows us to create products we just couldn't do before. Not only are we going to be delivering better products to clients, but we couldn't even reach the clients before. So it's a very exciting story in terms of how technology will impact on us. Nicole will take us - Nicole is the Chief Operating Officer, as you know, at the end of the table - will take us through that. As well as that, we've got Justin Moffitt in the audience for any other specific questions. Nicole.

Nicole Sorbara: Okay. Thanks, Nicholas. We've made significant progress over the last five years to allow our businesses to build on expertise and enable them to pursue opportunities to develop enhanced and often first to market service offerings. This has been driven by our investment in workplace, our investment in our people, in our core infrastructure, and also significant investment in our platforms. As you can see on this slide, we have made several senior strategic hires including a new CIO, Justin Moffitt.

We're also very heavily focused on the continued education of our people so they can drive the next generation of change. We can see on this slide the types of opportunities this has enabled the Operating Groups to pursue. BFS have undergone a banking modernisation program and this commenced with the core banking program several years ago. CGM have been continually investing in their platform and CAF have also expanded on their deep expertise in motor vehicles and developed platforms like MotoMe.

MacCap have also been partnering with entrepreneurs for over 20 years to support technology innovation, but core to this success has been the close collaboration with COG. As Nicholas mentioned, we spend about $A1 billion each year on technology and we have done so for several years. This includes people, hardware, software, and market data costs. We expect this level of investment to continue. A material portion of this spend each year is for new investments and new projects, but we also ensure each year that on a like for like basis, the running or the maintenance costs trend down.

So the end result of this is each year we're able to deliver more for this level of investment. A starting point for all of this is we have a relatively clean technology base. This means that the investments we make can take advantage of the opportunities and drive new pockets of growth. We are early adopters of technology and this has driven a lot of opportunities across the group. We've adopted a cloud first strategy and we have over a third of our infrastructure environment today running in the cloud, and we expect that that will increase.

We've also developed an open API architecture, and that allows us to securely connect partners with our data and our systems, and it's also starting to transform the way our clients can use their own data. We're going to hear shortly from Garry and Greg on more about this. We've created a differentiated work environment allowing our people to connect easily. This is increasing collaboration and innovation. We are one of the first globally in financial services to use workplace tools such as Office 365 and Workplace by Facebook.

We partner very closely with the Operating Groups. We are their trusted advisors to enable them to deliver on their strategy, whether that be the best ways to utilise technology or through providing expertise in emerging technologies. We saw in the opening video Dan Phillips from Macquarie Capital talk about the focus on cyber security investments. So we currently have a technologist from my team embedded within Dan's team who is advising him on this technology. Over 60% of our staff are directly aligned with the business and so the focus is bringing the business the technical expertise.

Ultimately, that is allowing them to get the best outcomes for their customers and their businesses. Garry, you've been doing some very innovative work in technology, particularly in the motor vehicle space. I'll now hand over to you.

Garry Farrell: Well, thanks, Nicole. COG are well and truly our partners in business here. Technology is disruptive and changing the world. We need to be ahead of the curve to know what's happening and offer better solutions to our customers. I'm going to talk a little bit about MotoMe. It essentially uses sophisticated machine learning to identify patterns in differences from data, customers' preferences about cars, cars they wish to own and drive. It's relatively unique, we believe, in Australia and around the world.

It basically is a car buying and financing ecosystem using digital, social and physical environments. Social, not just in terms of SMS, but through Facebook Messenger and Instagram. Physical in terms of when the transaction is done the customer can go to one of our participating dealerships or, in the near future, one of our participating stores. So the customer, if you log on to www.motome.com and type in a few details, postcode where they are, family, preferences, through the algorithm machine learning the system will actually pick a variety of cars that would suit the customer.

We can arrange a very competitive quote and actually buy the car for the customer. If the customer goes a bit further with its automatic credit decisioning and typing in some credit details in full APIs with the credit agencies we can approve the customer online on the basis of what the customer can afford so the customer then knows what they can afford. They can actually buy with confidence. Ultimately the car can be delivered to the home or to one of our participating dealerships or possibly one of our participating stores. It's a quite unique three year investment with our partners in COG and the technologists in CAF.

Portals - we go to the market mainly in small ticket flow through introducers. So we've been investing a lot of money going with COG in developing our portals in the UK and Australia. Full agile methods with full API functionality pulling credit stats, asset data, data to verify a customer - very, very important. Our functionality's really quite cool. It allows our introducers to transact for the customers online. It's innovative, intuitive, efficient and very transparent.

Automatic credit decisioning - we've been doing that for some time. We've had credit scorecards as well. It's all about offering better service to the customer from Macquarie's sector better decision-making on the risks that we price and take. Again, through COG we've built four APIs - very, very important. We've been slowly turning it on in certain business lines and certain credits in Australia and the UK, going slowly as we become more comfortable with the risks.

It's a fantastic service for introducers and our customers, very efficient. They know when they're approved online and can make the acquisitional finance. I'm now going to hand over to Greg who's been investing a lot in technology and in APIs. Greg.

Greg Ward: Thanks very much, Garry. Technology's really important and we're quite fortunate that we've got great technology expertise in the BFS business as Garry does in his business, but also in our COG business a really substantial team under Justin and Nicole, and we leverage that capability for the benefit of our business. Now, if we go back a step, of course, in terms of banking, banking was about big buildings to protect the cash, big bank vaults, an enormous branch presence and so forth, but no longer is that required.

We've been observing the way customers want to interact with their banks. The way they want to interact more and more is led by their interactions with other service providers and more and more of those are technology based companies. So with new technologies like cloud and advancements in digital technologies and mobile, we saw an opportunity to create a digitally led bank. But, importantly, one with a really strong brand and, of course, a fully product suite and offering. So very different than what had been seen.

So what we've been doing in BFS is embracing those new technologies as a way of delivering exceptional client experiences. It's the exceptional client experience that will bring clients to the business, and that's been a really important part of the growth we've seen in the last few years in BFS. What I thought I would do on this slide here is just take you through some of the investments that we are making because it's these sorts of investments that have captured the interest of clients and have led to the growth.

In terms of our leading digital banking experience, we think it is leading because there are a number of firsts in the Australian financial service marketplace, including things like instant client push notifications and natural language search. Natural language search is an example of really powerful feature, and clients seem to love this. So if this time of the year you're trying to work out, what did I spend on that Christmas holiday, or, what's my travel bill, rather than going through all of your accounts and meticulously finding all the bank statements and credit card statements and adding it up and trying to work it out, you just type in, what did I spend on travel?

What did I spend on Christmas holiday? The system will calculate that instantaneously for you, so a really powerful feature. We've looked at market leading technology companies and really companies that are leaders in client experience across a range of industries. We've pioneered the use of data stacks technology in financial services. This is the same technology that companies like Netflix and Facebook have used to create that really highly personalised and tailored customer experience that you probably get when you use those applications.

Now, one of the ways our customers see this technology in terms of a banking application is we categorise all your income and expenses. More than that, using machine learning it works out how you prefer those categorisations to work. Again, a really powerful feature, particularly when you get to the year end and you're trying to do your tax or just do a family budget. A really, really powerful feature. Also using this technology we're able to store documents on the system. So if you've got a warranty for a particular thing that you've bought that you want to keep and you'll need proof of purchase later on, you'll be able to find that forever in your banking application.

Every invoice or receipt when you pay can be stored online and you can make your own notes and commentary. Of course, typically banking systems are read only access and all you get is the statement and that's it. This is very intuitive, and, as I say, it learns along the way in terms of the way you want to do your banking. We've been recognised globally for the way we've implemented the API enabled architecture that Nicole mentioned with OpenShift technology from RedHat. This is tremendously powerful.

What this does is enable us to deliver new features - we can stand up in an environment in a matter of minutes. So we can stand the environment up, and we're able to deliver new features and functionality to clients in a matter of minutes. So very, very powerful. Again, clients benefiting. The other way clients are benefiting here is we don't need to take the system down, so that annoying message clients normally get that the system is down for ongoing or routine maintenance, we don't need to do that with our technology because of this sort of technology. So very, very powerful benefits to customers.

We've rebuilt our tech stack from the ground up - the only Australian bank to be doing that, and, I think, the first in the Australian market at least to offer all of our lending products and all of our deposit products on the same 24/7 real-time core banking system. So your mortgage product, whether it's a transaction account, a savings account, a wealth deposit account, a business loan account, all will be on this same core banking system and you can see that will offer us tremendous efficiencies and tremendous scale. There's been lots of developments in terms of open banking, especially in the UK and Europe, but also here in Australia and we'll see a report no doubt this month of that. We built Australia's first open banking platform to give our customers control over our data and the power to securely use that data in ways that suit them. We've already piloted the use of this with the company called Pocket Book which is a personal financial management tool and our customers were able to use tools like that in a very safe and secure way. So again, great customer benefits.

Now unlike a lot of the other financial institutions in Australia, most of our business comes through intermediaries and partnerships and we're able to support their business objectives and allow them to create a very customised offer for their clients. A great example of this is Woolworths Money, now Woolworths use our open API architecture and they combine that with their customer rewards database, in that way they are able to offer a tailored Woolworths Money banking experience curated alongside of the supermarket experience, very powerful thing. The other thing we are able to do there is to have unique branded banking experiences, and so we do this with most of the mortgage brokers in the country, so brands like Aussie Home Loans and Mortgage Choice and Yellow Brick Road, we're able to almost give them a bank in a box solution to offer a full range of banking services to their client base.

Finally platforms, and platforms have become very, very important in terms of technology, things like Airbnb and Uber and so forth, really dominant platforms, and we've been investing platforms for a long, long time. Our Wrap platform is a very significant platform, it's been the fastest growing platform for the last 5 years. In fact, we'd want every institutional that has come to market in the last 5 years, there's over $A85 billion on that platform. What we're doing now is we're moving that capability to real time and bringing in a lot of the cloud and digital technologies from our personal banking suite for the benefit of advice clients and for advisors in that space. In business banking we have our DEFT platform listed on the slide there, really significant, over 140,000 unique uses of that platform. An incredibly innovative when it was launched over 15 years ago, in fact, launched before PayPal was launched to market, so a real innovation back then and we've continued to invest in that platform. Just last year we introduced option pay, and this will change the way that customers pay for properties at auctions, and offering tremendous benefits for our real estate agent clients.

So just a snapshot of some of the investments that are powering the growth within BFS and I might hand over to you, Andrew, for some case studies in your team.

Andrew Downe: Sure, so look very simply technology is core for CGM's capabilities, we demand and our clients demand efficient, reliable, dependable, connection to markets, 24 hours a day, 6 days a week and in some cases 7 days a week. As you can see from this slide, transaction volumes have been increasing for us, up 22% and really the technology that allowed us to go out and grow the client base that is driving that transaction volume increase. Correspondingly, transaction costs are decreasing down to 23%. To achieve this we need to spend money, obviously, and at the moment we're spending more than $A300 million per annum across the CGM platform on technology. We process an enormous number of transactions every day and staying on the cutting edge of technology is both a competitive and a risk management necessity for us, and also for our clients. We also have expertise in the technology sector in our research department to assist both ourselves and our clients with technology company investments. I think MacCap have been doing in particular a bit of that.

Tim Bishop: Thanks Andrew, so in relation to technology for Macquarie Capital, I mean investing our balance sheet in the technology space has been a business that we've been in for nearly 20 years. We provide long-term capital in partnership with technical entrepreneurs, and these entrepreneurs are individuals that we typically have a long relationship and history with, and often having invested with them on multiple occasions. We don't look to take technology risks per se, in that we are investing after the technology has proven, clients use it and the company is generating revenue. Over our history we generally pursue two overarching themes, firstly internet and the impact of network benefits when business reach a certain market position, and that's been particularly successful for us in the online jobs and foot delivery space. Secondly, software and its role in analysing big data, and Nuix on the slide is very much on that theme. Nuix analyses unstructured data, typically emails, to help with clients with cybersecurity and forensic investigation, we are the major shareholder in Nuix, we're on its board and we continue to be actively involved in this investment. We have in particular really assisted Nuix in transitioning from a relatively small privately owned local business to a material global business, we've really helped to institutionalise that business. We've helped in terms of people, including board appointments to drive our US business and appointment of new CEOs and senior management.

Macquarie is itself a customer, and therefore been able to assist the Nuix production or product team on how to position their product with other corporate customers. Given the client base is typically government regulators and large multinational corporations, you have branding assist with Nuix's overall credibility.

In terms of what's next for Macquarie capital in technology, we're excited about this convergence between old world industries like infrastructure and the impact that technology is having on them. You know, it was known as the Internet of Things, where the increased use of sensors and for all types of applications and the analysis of the data that comes from those senses to improve productivity and efficiency and monitoring. We believe we bring something to this area, data is paramount and through our infrastructure business we have it. So for example, we recently acquired a 50% interest in a business called Environmental Monitoring Services, it's a global leader in real time monitoring of pollution and noise for infrastructure assets in particular airports. So we're excited about what we can bring to that company to help it grow and the broader potential of opportunities in that infrastructure tech space.

Shemara Wikramanayake: Thanks, Tim. Well, technology basically touches all three key areas of our business, so on the investing side in MIM as you saw Megan say on the video we’re using better data and analytics to try and supplement our alpha generation and in the neuro business you say Liz O'Leary talk about across our asset classes, how we're using technology to drive better outcomes. Secondly in terms of engaging with our investors, we're investing a lot in data transparency and dialogue with investors using technology and then finally in terms of our operational side back office and middle office, particularly in MIM we're going through a whole global platform strategy rework. That's all from me, Garry.

Garry Farrell: We've seen four key opportunities, I'm sure there's much more than that by the way. Really with the onset of driverless and shared vehicles, I was talking about the sharing economy, many services earlier, the opportunities are endless. You can see a statistic there that by 2030, 50% of cars will be electric. In Australia at the moment we probably have level 2 autonomy for more the luxury cars, Brake Assist, Learn Assist etc, and the manufacturers who we work closely with because we're a white label financier for a lot of car manufacturers in Australia, are thinking that in the 2020s you'll have level 4 autonomy. In other words, the driver will be at the wheel, the car in certain CBD areas where it's mapped and not in poor weather will be able to drive itself. Level 5 autonomy where you don't need a driver and a wheel is expected to come out in the 2030s and '40s, but who knows. Irrespective of all of that, we're very well positioned to actually be owning and financing this usage of assets and this increasing usage of EVs and autonomous vehicles.

Second key theme is the big shift from 4G to 5G, you will have heard about it, it's been in the newspapers for the last week but it's been in the newspapers for not much longer around the world. Actually 5G is being operated by some of the manufactures with trials through Europe etc. It's all about pushing more signals down the pipe with less power consumption and battery usage, and an increasingly connected world, as I spoke about earlier, and with Internet of Things and there's enormously stunning statistics about the Internet of Things and the driver of growth. Frankly the telcos and the equipment manufacturers need to finance this shift. There's a spend of something like between 2019 and 2025, one the estimates global cap ex $A225 billion per annum, falling out that to near $A200 billion per annum, so a massive shift. So obviously we can be involved in the solutions in terms of phasing out 4G for our clients and funding the 5G.

Another key thing with technology is health.

Last time I looked we were all getting older and unfortunately more things go wrong with us. But for good reasons we can be diagnosed very quickly. Now, Tim was talking to those sensors, sensors I think in airports checking out noise and pollution and things like that. Well sensors are available for the body, you know, the simple probably integrated circuit with Wi Fi that can actually measure you heart rate, your blood pressure, chemicals, hormone imbalances etc. They can be through Wi Fi, again internet centred device like this so you can work out what's going wrong with you. Hopefully you liaise with your doctor, hopefully your doctor liaises with the clinic if it goes that serious, but there's enormous opportunities here and the spend with IT and telecommunications is enormous.

Now we structure transactions where we've funded day clinics, whether it's oncology or laser treatment, or just surgery, where we actually promised to a hospital, a medical unit that they'll have state of the art technology for 10 years and we refurbish it and refresh it constantly, all paid per use, per surgery or per laser treatment.

The final thing is really big data, everyone in Macquarie is using big data, defining the data, interpreting the data, with APIs getting further data and using algorithms. It's all about customer behaviour, if we can understand what our customer wants before they tell us, we can hopefully offer better products and solutions to that customer. In terms of the assets, we like to own and finance assets for our customers, now with supply and demand and different micro and macro factors around the world, utility of assets is changing dramatically and we have to be ahead of the curve on our risk decisioning to actually make sure that we're funding assets that make sense. We can also on the flip side offer better products and solutions for our customers. Of course, Greg is actually investing a lot of money in the technology, so Greg, what's next for you?

Greg Ward: Exactly, Garry. More of that investment to benefit customers. We think customers are enjoying that digitalisation journey that we're on, we're getting a lot of good feedback from customers and some very encouraging growth so we're going to continue that digitalisation journey and that investment because it is working for our customers and working for us. More specifically in the personal bank we see a long way to go in terms of mortgages. Mortgages is one of the slowest products to get for a customer and one of the most expensive products to put on the books, so think there's a bit opportunity to continue the work we've done in mortgages so we'll continue investing there.

In the wealth space, the Wrap platform, so we'll be re-platforming a number of the applications within raps and we think this will be tremendously beneficial for the advisor clients that we work with and institutional clients, and also their clients. There will be a big investment take place there. In the business bank we've got some wonderful platforms, and I exampled earlier the Deft, which is great for real estate agents, strata managers and so forth, we'll be rolling out some new platforms that will benefit other segments. So some wonderful benefits from our investments there across the 3 businesses within BFS in terms of client experience. Of course the other thing that this investment is doing is yielding benefits to our business. In 2012, the BFS cost to income ratio was 85% and that's fallen now to 69%. Over that period, the cost base has fallen 1%, so the total cost of BFS has gone down 1% from 2012, so we are getting some efficiencies. Now we're seeing more dramatic efficiencies in the areas where the investment has gone, so in the personal bank, back in 2015, just two years ago, the cost of revenue was 70%, this current year it's 50%, we expect that to fall below 40% as we continue rolling out some of the technology.

Now why don't we wrap - I'll hand back to Nicole to wrap up technology.

Nicole Sorbara: Okay, thanks Greg. Our first area of focus is automation and really accelerating the automation journey that we've been on. Research shows that if Australian companies accelerate the rate of automation by 2030, there is a $A1 trillion boost to the Australian economy. Then in addition, if they also actively reskill their employees, there's a further $A1.2 trillion increase.

We have already been automating a lot of our processes, there's some great examples today in Garry's world, also in Greg's world as well. For us, it is about accelerating that but automating more complex processes. For example, in my own world, in the operations world, we're currently experimenting with automation and artificial intelligence technologies to automatically read, understand and process complex legal documentation and contract notes from our counterparties without any human interaction. But importantly, we do have a strong focus on educating all of our people and continuing that reskilling on new and emerging technologies so they can find the opportunities and this is consistent with our bottom-up evolutionary approach.

Finally, the other area that we're really focused on is the data and analytics and not only gaining insight into our operations, but insight for each of the Operating Groups. We've heard from Greg and Garry, from a retail and customer perspective, how they're already using big data, but we're also using it in businesses like CGM. So we have been using big data and machine learning to predict energy demand based upon weather patterns. One of the benefits and what's next coming out of the Cargill acquisition is that acquisition has given us additional capability, we have some data scientists, but also additional technology that's now allowing CGM to get more sophisticated insights and we're now starting to look at how we can apply this across other asset classes as well.

Sam Dobson: Great, thanks Nicole. I'll open up for questions and let's see, we've covered two sections there, so technology, energy and start with questions on the floor. Andrew.

Question: (Andrew Lyons, Goldman Sachs) Sam, Andrew Lyons from Goldman Sachs. Greg, you noted the imminent release of the Federal open banking inquiry, can you perhaps provide any views on the direction this might take banking in

Australia over the next couple of years and what opportunities you see it providing Macquarie over that period?

Greg Ward: We're very optimistic, very supportive and very optimistic. We've been monitoring for the last few years the advancing developments in Europe and the UK, as I said. It will be a slow and steady rollout approach, no doubt. We hear about how complicated that will be for people. We've taken a different approach. We think it actually needn't be that complicated and we've invested in a technology to support our customers in being able to use their data in the way that they would like. So we're very positive about the impending release and hopeful that it will speed up in a broader adoption. But we won't be - we're not waiting for that, we're just moving ahead for the benefit of our customers and a whole range of other service providers that want to work with us, with their customers. So that's very encouraging.

Question: (Simon Fitzgerald, Evans and Partners) Hi there, Simon Fitzgerald here from Evans and Partners, another question for you, Greg. A lot of the technology initiatives you've shown here are probably the most visible across the Group. So I'm wondering, do you have any comments in terms of how long you can hold that competitive advantage and maybe any other comments in terms of what's happening across banking operations across the country as well?

Greg Ward: Yes, look in some areas I think we are well ahead of the industry. It does help where you're starting from a relative positive of not a lot of legacy. That's not to say we have no legacy, there obviously are legacy platforms and so forth, but our scale is much, much smaller and so we've been able to move much more quickly at adopting some of the new technologies and some of these are really quite new. I think the bigger you are, almost the harder it is to make the change because there's a lot more data and legacy to change. Building a tech stack from the ground up is not that easy, I think, if you’re an incumbent. So why does that matter? I think it matters in terms of the quality of the customer experience. You can paper over that and try and make up for things that don't work quite as well in the core systems and the back end and so forth, but it does take a lot of careful design and thinking and tech to deliver that really rich customer experience where you just go, that just works really well. So I think we're very well placed. Everyone is investing heavily in the same sorts of areas, so we're not taking the view that we need to be the best at everything or the first at everything, but we think if we've got a leading offer that will service very, very well in attracting a meaningful portion of customers and we're seeing some strong support already.

Sam Dobson: Just at the front.

Question: (Frank Podrug, Merrill Lynch) Thank you, Frank Podrug, Merrill Lynch. Andrew, just going back to energy, given the shifts in supply and demand we've seen in the US, I wanted to get your thoughts on what that means both domestically and globally. So domestically, whilst you had a kick up in production, not much storage build, a lot of demand coming on board from LNG exports, pipes and industrial. So is that market perhaps structurally set and cyclically set for more volatility in wider spreads in the future?

Secondly, globally there still persists a pretty wide spread between LNG prices coming out of the US and global energy prices and I guess there are good structural reasons for that. Do you think that persists given all the LNG export capacity coming on board and what role can you play in that market?

Andrew Downe: So I have a fundamental view that over time most of the energy markets will head towards global and there are some that won't be, so power is ultimately each distinct region and market. So it's slow but accelerating, as far as I can see, off perhaps a low base, at least in the gas side. So working your way through it, oil's obviously a pretty global kind of market; coal's a pretty global market. When you get into gas, it's not yet but LNG I do see facilitating that and the US becoming a substantive exporter. I mean it's already affected the prices in Asia a reasonable amount, even though the actual quantum that's coming out at this point in time is not that great, but there are a lot of contracts now in place.

Then the other thing I'd say to you is that everyone's aware of the massive growth in Asia for energy and the quantum of energy that's required and people are kind of building out in advance for that, if you like. So I think there's a lot of investment at the moment that's sort of going towards bringing more equalisation prices across different regions.

Just try to cast my mind about your first question about the US, I think it was more regional within the US what happens. It is pretty interesting. We are seeing lots of change and there are definitely lots of pricing imbalances just within the US region and it's been driven by both parts of the equation. So you've either got production situations where arguably technology is changing things and ramping up production and then frankly there's just a lag in the infrastructure to deal with that. One of the things we're concerned about even on the LNG side is sure, the major pipes are in place, but the actual pipes to go the last mile into the LNG storage to export, actually there's a lot of work got to be done there.

Then so to the supply side, there's lots of change going on and there are still situations where you've got pricing differences driven by the lack of infrastructure to be able to move molecules. Then the second thing is, on the demand side, we would be seeing at least once a week a tender from a major industrial facility that's being built in the US in different regions, essentially close to energy sources, that we're being asked to tender for. Now that's only just starting in our opinion, obviously part of the Trump plans, but we do see a lot of domestic investment in industrial consumption going on and that is starting to drive demand imbalances as well across the regions in the US.

Sam Dobson: Brian, up the back.

Question: (Brian Johnson, CLSA) Brian Johnson, CLSA, two sub-questions. One very quick one, Garry, how do you manage the residual value of risk in the auto portfolio? Tim, at the Operational Briefing about two years ago, you ran us through the principal investments business and talking about a hold period and target IRR, then flick the investments out. If I have a look just at the last result, if I was to go back to the full year result, you had $A1.7 billion of allocated equity. That figure has drifted up to $A2.3 million, I assume is green investment bank. We sit in the briefing here today and we see specific mention of PEXA, NUIX and Quadrant, could you just update us on basically the overall metrics that you're trying to achieve in that book and the whole period?

Garry Farrell: Sure. I go first, Tim?

Tim Bishop: Yes, go Garry.

Garry Farrell: Well in our motor vehicle books, we don’t take residual value, Brian, in Australia or the UK or the US. That might be something down the track we do look at. I was talking about the usage model and if Macquarie is the person that owns the asset with equipment, supplies, etc, we'll have to get our mind around that in the future ultimately, but we can bring people in that will take residual value. But in our books at the moment it's a money-on-money transaction, we don't take the residual value risk, we just purely have a credit risk. Hopefully that answers your question there.

Tim Bishop: Yes, thanks Brian. I think firstly in relation to the step up in our capital that we have in the principal book, firstly it is a point in time, obviously it's not necessarily an average over a year, but increasingly where we're investing is in the green energy space. So a lot of that increase is coming about as a result of increased level of activity in green energy. As hopefully I've portrayed, a lot of what we're doing though is in that early stage or is in the development and construction phase and therefore I think the returns in that phase, albeit with increased risk, are very attractive.

But the target there is to transition those assets into a position where they're de-risked and they're operational and therefore ultimately get transferred to the more natural, long-term owners. There are points on that journey where we're faced with a choice or a decision to make as to whether or not then is or now is the appropriate time to divest. So we're comfortable with the return metrics, I think, for that activity and I think, as I said, that's really been the driver of the increase.

In terms of specific assets, I won't comment necessarily on them individually, but generally the book is in good shape. Obviously ultimately we want to realise profit from these investments and I won't comment on our intentions going forward, but I'm happy to talk about the past and we haven't sold any shares in those three companies that you mentioned. They're appropriate to deliver an appropriate return on equity to shareholders, depending upon their risk profile. Obviously it's different when you're ranging from common equity through to mezzanine or debt-oriented investments.

Sam Dobson: All right, in the interest of time, we'll take one more question. Just at the front there.

Question: (Anthony Ho, Deutsche Bank) It's Anthony Ho here at Deutsche Bank. Question around green energy or investment in green energy, I mean it's an area that can see social and political issues being involved. So the question is, how does that influence the level of returns that you get? Does it impose any constraints or conversely, does it actually boost returns, given the influence of government policy?

Shemara Wikramanayake: Yeah, it's probably just one of the risk factors we take into account so obviously there are regimes that support renewable energy all around the world and we look at the sustainability of that regime as just one of the risk factors.

Tim Bishop: Yeah, I think it's the same point. I think that when you think about, in the case of Macquarie Capital, its growth in Asia, a lot of that is driven by the regulatory regime, so the government regimes that exist particularly in Japan and Korea and Taiwan as well, albeit increasingly the world is moving towards a market where the subsidies from governments are less relevant. So our challenge is making sure we're getting ahead of that.

Sam Dobson: Okay, well I'd like to thank you all for coming. We do have some refreshments outside if you want to stay. Thanks again.

[END OF TRANSCRIPT]