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Earnings Call

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OVERVIEW:

Co. reported 3Q15 revenues of TWD213b and EPS of TWD2.91. Expects 4Q15 revenues (based on certain items) to be TWD201-204b.



CORPORATE PARTICIPANTS

Elizabeth Sun *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

Lora Ho *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

Mark Liu *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

C.C. Wei *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

CONFERENCE CALL PARTICIPANTS

Michael Chou *Deutsche Bank - Analyst*

Randy Abrams *Credit Suisse - Analyst*

Gokul Hariharan *JP Morgan - Analyst*

Donald Lu *Goldman Sachs - Analyst*

Roland Shu *Citigroup - Analyst*

Eric Chen *UBS - Analyst*

Bill Lu *Morgan Stanley - Analyst*

Brett Simpson *Arete - Analyst*

Mehdi Hosseini *SIG - Analyst*

Steven Pelayo *HSBC - Analyst*

PRESENTATION

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

Welcome to TSMC's third quarter 2015 earnings conference and conference call. This is Elizabeth Sun, TSMC's Director of Corporate Communications and your host for today. Today's event is webcast live via TSMC's website at www.tsmc.com. If you are joining us through the conference call, your dialed-in lines are in listen-only mode. As this conference is being viewed by investors around the world, we will conduct this event in English only.

The format for today's event will be as follows. First, TSMC's Senior Vice President and CFO Ms. Lora Ho will summarize our operations in the third quarter, followed by the guidance for the fourth quarter. Afterwards, TSMC's two co-CEOs Dr. Mark Liu and Dr. C.C. Wei and CFO Lora Ho will jointly provide our key messages. Then we will open both the floor and the line for the Q&A.

For those participants on the call, if you do not yet have a copy of the press release, you may download it from TSMC's website at www.tsmc.com. Please also download the summary slides in relation to today's earnings conference presentation.

As usual, I would like to remind everybody that today's discussions may contain forward-looking statements that are subject to significant risks and uncertainty which could cause actual results to differ materially from those contained in the forward-looking statements. Please refer to the Safe Harbor notice that appears on our Web -- on our press release.

And now I would like to turn the podium to TSMC's CFO Ms. Lora Ho for summary of operations and current quarter guidance.

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

Thank you, Elizabeth. Good afternoon, everyone. Welcome to join us today. I will start with the financial summary for the third quarter and followed by the guidance of the fourth quarter.



In the third quarter, demand for TSMC's wafers was essentially flat with the second quarter, mainly reflecting customers' cautious inventory management. However, a stronger-than-forecasted US dollar against the NT dollar caused our third-quarter revenue to exceed the high-end of our guidance even in July.

On a sequential basis, revenue increased by 3.4% to NTD213b, and gross margin decreased 0.3 percentage points to 48.2% as the benefit from higher capacity utilization and variable exchange rates were outweighed by unfavorable inventory management and the margin dilution from 16 nanometer.

During this quarter we ceased TSMC's solar operations and incurred a loss of NTD2.8b. Among the total, about NTD400m was recorded in cost of goods sold and NTD2.4b in other operating expenses. The loss dragged down our operating margin by 1.3 percentage points and reduced our EPS by about NTD0.08. Operating margin in the third quarter decreased 0.6 percentage points to 36.9%. Without this one-time solar write-off, our operating margin would have been 38.2%.

For non-operating items, ASML shares' disposal gains were NTD3.7b or NTD0.13 in EPS. For comparison, in the second quarter we recorded NTD20b disposal gains on ASML and Vanguard shares.

With all these items, our third quarter EPS was NTD2.91.

Now let's take a look at revenue by application. During the third quarter, communications, computer, consumer, and industrial increased 1%, 15%, 3% and 11% respectively. These numbers reflect the change in favorable foreign exchange rate already.

In terms of revenue by technology, we are pleased to report the first quarter of 16 nanometer volume shipment. 16 nanometer and 20 nanometer combined contributed 21% of our total wafer revenue in the third quarter.

Moving to the balance sheet, we ended the third quarter with cash and marketable securities of NTD525b. Current liabilities decreased by NTD108b mainly as we paid out NTD117b of cash dividend in July.

On financial ratios, accounts receivable turnover days decreased 2 days to 42 days. Days of inventory decreased by 3 days to 59 days as we now have lower days in work-in-process inventories and we shipped the 20 nanometer wafers we pre-built last quarter.

Lastly, I would like to make a few comments on cash, cash flow and CapEx. During the third quarter we generated NTD118b cash from operations, invested NTD70b in capital expenditure and paid out NTD117b cash dividend. Additionally, we received about NTD15b from disposal of ASML shares and borrowed NTD28b in short-term loans for currency-hedging purpose. As a result, our cash balance decreased NTD13b to NTD516b at the end of the third quarter.

So, I just finished the summary of the third quarter financial outcome. Now let me turn to the fourth-quarter outlook. Due to the weaker-than-expected end-market demand, customers continue to manage inventory cautiously. Meanwhile, 16 nanometer will ramp strongly and contribute more significant revenue in the fourth quarter.

Based on our current business outlook and exchange rate assumption of \$1 to NTD32.71, we expect our fourth-quarter revenue to be between NTD201 and NTD204 billion, gross profit margin to be between 47.5% and 49.5%, and operating margin to be between 36.5% and 38.5%.

You may notice that the midpoint of gross margin guidance is slightly higher than third-quarter gross margin, despite lower revenue. This is because we expect our cost improvement and favorable inventory valuation adjustment to fully offset the impact from lower capacity utilizations.

In addition, the expiration of the remaining hedging contract on ASML shares will contribute about NTD0.01 per share in the fourth quarter. And that will be the end of the total accounting treatment.

This concludes my remarks. Now let me turn the podium to co-CEO Mark Liu for his comments.

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Good afternoon, everyone. I would like to give you some remarks, some messages here. My message has three parts. First, I will talk about near-term demand. I will describe the background color. And I'll talk about TSMC's long-term growth drivers. Then the third part is leading-edge technology development update.

Now first, the near-term demand. This year, due to a weaker global economy, a stronger US dollar environment and a volatile financial market, the electronic device market has been negatively impacted, resulting in a lack of growth in the overall semiconductor market. In addition, we see the unexpected slowdown of the economy in China since the Q1, resulting in a continuous sluggish smartphone demand in China. This led to our relatively flat revenue growth in the third quarter. And we think the inventory level in the fabless industry will be still above seasonal normal by about 10 days at the end of the third quarter.

Looking forward, we see the active inventory reduction actions in the fabless companies continue into the fourth quarter. Nonetheless, our accelerated ramp up of 16 FinFET Plus technology, supporting high-end smartphone market, did uplift the otherwise weak wafer demand. Therefore we forecast a moderate decline, about 4% to 5% of revenue, from the previous quarter.

We estimate that the fabless industry inventory will likely settle to a seasonal level towards the end of this year, albeit some uncertainty on this still exists.

Given the fourth-quarter guidance, TSMC should be able to deliver a double-digit growth, at about 10% to 11% year on year in 2015, thanks partially to the stronger US dollar.

Our 2015 forecast of the growth of smartphone unit shipment is 10%, PC for the industry is minus 6%, tablet minus 14%, digital consumer electronics minus 6%. The semiconductor industry growth is about zero percent. And our fabless industry growth is minus 5%.

The next part I will talk about TSMC's long-term growth driver. In the past three to four years, the growth of smartphone market has propelled TSMC's growth. Recently, we see the total unit growth of smartphone appears to be slowing. However, the silicon content in all segments of smartphone continues to increase. This silicon content increase particularly shows in the high-end smartphone. For example, the unit growth of high-end smartphone this year will be about flat, but the silicon content of the high-end smartphone will still have a mid-teen percentage growth.

We see the bifurcation of high-end and mid, low-end smartphone markets continues. And the high-end smartphones, which provide richer features, higher performance and lower power consumption will continue to drive the demand of leading-edge technologies. We stand to benefit from this trend. Smartphone will continue to provide growth momentum for TSMC in the next two to three years.

TSMC holds our corporate mission of being the trusted technology and capacity supplier in the logic semiconductor industry for years to come. We work closely with many of our partners and collaborate with them to produce the best product in many market segments, each with differentiations of its own.

From that, we see several drivers of future demand growth. It is very encouraging. Three areas that we will soon add to the growth of TSMC in the coming years; first computing market. In addition to the smartphones, we see faster growth of processor unit demand in many applications. With the Internet traffic near exponentially increasing, people are to extract intelligence out of the mountains of data. Extensive computation not only needs to be done in the data center, much must be done in the network as well as the distributed edge of the network. Image processor, CPU for automotive, CPU and GPU for augmented reality and virtual reality are examples.

Second, fabless system company. We now see a new breed of fabless system companies coming to join the plate of semiconductor product innovations. With the enhanced SoC integration and systems software and hardware integration, new usage models with brand new markets are opening up for the semiconductor industry. We have been working with these fabless system companies for several years.

Third, Internet of Things. As billions of things are connected to Internet with sophisticated computing and analysis, they soon will become intelligent enough to create new user experiences and to improve the efficiency in many aspects of life, work and leisure. Recently we see fast innovation taking place in areas such as cars, drones, robots, wearables and smartphone devices.

Working with innovators around the world, we continue to see the insatiable need for performance of leading-edge technologies. We also see the need for advanced packaging technologies to increase the overall system performance. Thus, we will continue to increase the pace of our leading-edge technology development. Leading-edge technology will continue to be the major driver of TSMC's future growth.

The third part, I'd like to update you about our leading-edge technology development. Our 10-nanometer technology development is well on track. This technology has a logic density of 2.1 times of its previous generation, that's 16 FinFET Plus, with performance of 20% enhancement or a power consumption reduction of 40%. During this quarter, we will freeze the process and begin technology qualification for our 10-nanometer technology. Customer product tape-outs will soon begin in next spring,

TSMC's 7-nanometer technology will fully leverage of our 10-nanometer yield learning and the progress of our 7 nanometer is well on track as well. The migration from 10 nanometer to 7 nanometer provides substantial improvement in performance, power and density. We are very happy to inform you that fully functional SRAMs on our 7 nanometer have already been demonstrated.

On advanced packaging development, our InFO technology will enter high-volume production with our 16-nanometer technology next year. We are currently working on the second-generation InFO technology for several projects of system integration on 10 nanometer and 7 nanometer.

That is my key messages. Thank you for your attention. I will turn the podium to C.C. Wei.

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Good afternoon, ladies and gentlemen. I will update you the status of our fab operations on the following topics. First one, 28 nanometer. Due to customers expediting their inventory management, as Mark just pointed out, the demand for our 28 nanometer has been reduced in the fourth quarter. As a result, 28-nanometer utilization rate came down from above 90% in third quarter to a level below 80% in the fourth quarter. However, the outlook for 28 nanometer remains very promising, thanks to our newly developed 28 HPC and 28 HPC Plus technologies. These two new technologies not only suit the mid to low-end smartphone requirement, but also highly useful for other applications such as WiFi, digital TV, set-top box and image signal processor, etc.

Overall, we expect we will ship a similar amount of 28-nanometer wafers this year as we did last year. And we expect to ship more 28-nanometer wafers next year. We have increased our market segment share in 28 nanometer this year. We believe our technology and cost advantage will enable us to compete well. Going forward, we expect to continue to protect our market segment share and gain a good profit.

Next on 20 nanometer. Because of generally weaker demand, as Mark described, and several customers have accelerated their product migration to 16 FinFET Plus, the demand for 20 nanometer this year falls somewhat short of our estimate made at the beginning of this year. That said, we continue to stand by our earlier predictions that revenue from 20 nanometer this year will be at least double the level we had last year.

Given the demand outlook change and the high ratio of common tools, we will continue to convert 20-nanometer capacity into 16 nanometer.

Now let me update you on the 16 nanometer. We began high-volume production of 16 nanometer in third quarter as planned and saw revenue contribution from 16 nanometer become better than we expected earlier. 16-nanometer yield improvement is progressing very well, setting a new record internally for ramping up a new technology node.

In addition to 16 FinFET Plus, we are developing 16 FinFET C for the low -- application; I'm sorry. Today we have already completed the first phase of 16 FFC and obtained good result. Between 16FF Plus and 16 FFC, we will have around 100 product tapeouts from about 40 customers before the end of 2016, with very comprehensive portfolio including mobile, networking, CPU, FPGA, consumer and the GPUs. We believe our 16-nanometer portfolio, including 16 FF Plus and 16FFC are very competitive.

We anticipate continued ramp up into 2016 as multiple customers in both mobile and consumer applications will drive the production in parallel. Similar to 28 nanometer, we believe 16 FinFET will become a long node supporting multiple, high-volume market applications. TSMC's technology advantage should allow us to capture a large majority of this demand.

Now let me update InFO. We have completed the construction of the new facility in Longtan and are ready for InFO's volume production. The manufacturing equipment move-in is on schedule and also we target volume ramp-up at second quarter next year.

Compared to existing package scheme, TSMC's InFO can bring greater-than-20% reduction in overall package thickness, 20% speed gain in performance and 10% better in thermal performance for power dissipation.

So we are -- now InFO technology is capable and well positioned to enable next-generation mobile applications. So right now we continue to work with major customers on completion of their product qualification. Meanwhile we are developing the next-generation InFO process, as Mark just said, for the future application.

Our expectation of InFO contributing more than \$100m quarterly revenue by 4Q 2016 remain unchanged.

Now let me update on specialty and 8-inch fab. In order to meet our customers' requirement and the more-than-Moore demand, we have developed specialty technology based on our logic processes. We have been doing this for more than 15 years by now. Applications such as MEMS, power management, CMOS image sensor, high-resolution display driver and high-precision analog have been the main drivers for the specialty technologies.

After these years' effort, demand for these specialty technologies has grown substantially and account for more than 70% of all the 8-inch fabs business. Some of the specialty applications have also moved to 12-inch fab of course. We expect this trend will continue and we are preparing sufficient capacity, both in 8-inch and 12-inch fabs to address the need for specialty technologies.

Thank you for your attention. Now I'll turn the podium to Lora.

Lora Ho - Taiwan Semiconductor Manufacturing Co Ltd - CFO

I have a few comments, so let me start with 2015 CapEx. Six months ago we gave our 2015 CapEx guidance in the range between \$10.5b to \$11b. Due to a combination of factors, including efficiency gains, capital investment program changes, capital deployment schedule changes and foreign exchange rate changes, we now expect our 2015 capital budget to be about \$8b.

Of those changes, about 33% or one-third of the reduction of CapEx is due to operating efficiency gains that let us to spend less money but still have the same output. Another one, about 30% of the reduction is due to changes in the investment projects, including the conversion between 20 nanometer and 16 nanometer. Another one, about 20% of the reduction is due to changes in capacity schedules. Lastly, the remainder, about 17% of the total reduction is due to the strengthening of US dollar against euro, Japanese yen and NT dollars.

We expect our 2016 capital budget will be higher than this year.

Next one is regarding our structural profitability. In the last few years we have been able to maintain or improve our structural profitability, despite making heavy capital investment. This is mainly due to three reasons. Number one, operation innovations leading to productivity efficiency and better asset effectiveness. Number two, very careful planning in the build-out of capacity. Number three, fast yield-learning when ramping new nodes. All these three factors allow TSMC to enjoy a large cost advantage which leads to a better structural profitability.

TSMC's cost reduction efforts are as intense as our R&D efforts. As a result of our cost reduction, we have been able to maintain our structural profitability in spite of price pressure. And we expect to continue to do so in the foreseeable future.



I will talk about our solar operations. There have been a lot of changes in the world solar industry since we started our solar operations six years ago. Capacity over-build in the solar module industry coupled with the substantial price decline has made TSMC's Solar's future highly doubtful. Despite hard work at TSMC Solar throughout this six-year period, we have decided to terminate its operations at the end of August this year.

Owing to this change, we have evaluated financial impact across all accounts. The total impact is about NTD2.75b which reduced our third-quarter operating margin rate by about 1.3 percentage point and reduced our third-quarter EPS by about NTD0.08.

TSMC will continue to honor all product warranties that have been offered to existing customers. And we also extended employment offers to all employees working at TSMC Solar Taiwan at the time of the closing.

My last comment is regarding China investment. In the last several months we have been actively evaluating the potential investment of a 12-inch fab in China. The considerations include the positive development of semiconductor market in China and the large pool of engineering talents. On the other hand, the manufacturing cost will be higher in China than in Taiwan due to lack of economy of scale and many other reasons. So, as of now, we are still evaluating the potential investments.

This ends my remark. Thank you.

QUESTIONS AND ANSWERS

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

All right. This concludes our prepared statements. (Conference instructions). Now let's begin the Q&A session. Our first question comes from the floor and it will be from Deutsche Bank, Michael Chou.

Michael Chou - *Deutsche Bank - Analyst*

Thank you. Two questions. First question is, regarding your 16-nanometer FFC, would that enter mass production in the second half next year or 2017? That's the first question. Thank you.

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

That will be, to repeat your question, you said that would be in second half of next year and enter into --

Michael Chou - *Deutsche Bank - Analyst*

Or 2017.

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Or 2017. Our initial schedule actually said in 2017, but we might pull in because right now we have two versions of 16 FFC. One is shrink and the other one is a non-shrink.

Michael Chou - *Deutsche Bank - Analyst*

Second question is, regarding your InFO, will customer use 2D or 3D in the future or is this too detailed. Sorry.

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Right now it's 2D.

Michael Chou - *Deutsche Bank - Analyst*

Okay.

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Yes. But in the future of course we are going to the 3D dimension.

Michael Chou - *Deutsche Bank - Analyst*

Do you think the 3D yield rate will be similar to 2D yield rate?

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

We are working on it.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

All right. Next it will be coming from the floor again. That will be from Credit Suisse, Randy Abrams.

Randy Abrams - *Credit Suisse - Analyst*

Thank you. My first question on 16 nanometer. Some of the third party benchmarks are showing good performance, better battery life than your competitor. I'm curious if this could trigger some incremental strength for your 16; how you see the ramp up now on 16 relative to 20 where it ramped to 20% of revenue pretty quickly.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

I think Randy's question is whether or not the reported differences in the chip will lead us to have more demand.

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

We are very confident on our technology, of course. And if you say what they reported in the newspaper, I would say that we -- our customer already made an announcement that there is very minimal difference between TSMC and our competitors in the normal usage condition. And we respect their analysis.

Randy Abrams - *Credit Suisse - Analyst*

Okay. If I could ask a follow up just on 16, and on the second question. How are you seeing now then the ramp of 16 or broadening out to additional customers. Should we expect contribution and diversification of the customer base to grow quite a lot in the next couple of quarters, or do we need to wait for 16 FFC for that diversification?



Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

We expect the ramp up, and probably quicker than 20 SoC. And we developed FFC; certainly we hope the 16 nanometer will become a major node. And so we expect that more business, of course.

Randy Abrams - *Credit Suisse - Analyst*

My second question, just looking ahead, because you talk about normal inventory by the end of the year, if you could talk, the last four or five years you've actually held flat, sequentially Q4 to Q1. If we should think normal inventory, do we have restocking again in first quarter, or we could have similar -- the new, post-crisis seasonality where things are stable. I guess if you can give a view how we look for demand and inventory into first quarter.

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Well, for the inventory in the fourth quarter our estimate is close to seasonal normal. But, as you know, the inventory going into first quarter really depends on the burn rate in the first quarter. That estimate still is a three-month backward numbers. So that's why I mentioned that some of the uncertainty at the end still exist. But we certainly hope that Q1 next year will come to a normal quarter.

Randy Abrams - *Credit Suisse - Analyst*

Thank you.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

All right. The next question will be also coming from the floor. It will be JP Morgan's Gokul Hariharan.

Gokul Hariharan - *JP Morgan - Analyst*

Hi. Thanks for taking my question. My first question is on the new opportunities that you mentioned on the computing side. Could you talk a little bit about what are the developments that you're seeing? Are we going to see opportunities on the computing side primarily on the data center side coming through? And also maybe a quick stab at what you think the opportunity could be in the next, say, couple of years on the computing side. And I have a second question to follow up.

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Let me repeat your question so that I make sure I answer your -- the -- you mentioned about -- asked me to comment more on the computing side, whether the computing side is more on the data center or other areas.

Gokul Hariharan - *JP Morgan - Analyst*

Or on the client PCs.

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

The client --

Gokul Hariharan - *JP Morgan - Analyst*

The client computing side itself.

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Yes, I think TSMC has been supplying the processors, distributed processors in bigger shares. And more recently we see the processors' growth increasing. And therefore we think the computing market, we meant not just data center, but also the distributed processors, namely application processor. If you look at the application processor, unit growth is much faster than smartphone growth, microprocessors, Image processors, when you diagnose, absorb the images, you need to process outside. And there is still quite short about the capability of a automated car, for example. And network processor is also important. And of course we include microprocessors and CPU definitely is one area. By CPU I mean the Chrome Book, that type of distributed processors. That area we think -- we see growth and we believe, as the data continue increasing, the local processing capability has to increase tremendously. Yes.

Gokul Hariharan - *JP Morgan - Analyst*

And when you go about this market, do you see this market probably exceeding what the current mobile application processor or mobile processor market is or any kind of estimates that you can talk about within a bit more longer-term horizon?

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Well, it is hard to estimate because the usage model, the service, those big data service, analytics services are still yet to prevail to the -- to our lives. So at this point it's not as big. And I think it will take off before the smartphones' growth stop.

Gokul Hariharan - *JP Morgan - Analyst*

Okay. Just my second question is on the CapEx intensity. I think previously Lora had mentioned that we'd come down to a 35% level in capital intensity. This year we are down to around 30%. Should we think about the \$8b CapEx this year as a one-off and then we go back to the normalized \$9.5b, \$10b levels or even higher that we saw in the last few years, or -- just some color, initial color in terms of what kind of CapEx jump are you expecting next year as you support some of these newer opportunities as well. Thanks.

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

I just mentioned this year's \$8b is kind of low. And next year expect to be higher than \$8b, although it's too premature to give a precise number.

Back to my earlier comment, the future CapEx intensity will be at a mid-30% level, the statement still holds. I think it will be within 30% to 35% range.

Gokul Hariharan - *JP Morgan - Analyst*

Okay, thank you.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

All right. Next question will be coming from the floor. It will be Goldman Sachs, Donald Lu.

Donald Lu - *Goldman Sachs - Analyst*

Hi. (Spoken in foreign language). Sorry, my first question is about the CapEx. So TSMC cut CapEx quite substantially in three months. Last time we had the guidance back in, I think, July. And I think there are three reasons. I think efficiency gain and conversion, those things doesn't seem like it's something you just find out in the last three months. Is there anything new that you realized that make you to change CapEx so much or is that -- and also I remember in the past you always talk about the CapEx today is for production a year later. Do you become very cautious about something next year? Thank you.

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

CapEx management is a continual effort. As you say it just come out in one month or two months. So we have seen a trend. In the last quarter I mentioned about the CapEx we still hold our original number but there may be some changes. So things evolved and we continued effort to drive the CapEx efficiency. And we have gained a lot of experience doing this in the Company.

So if you look at the reductions, actually it's more than half is truly efforts, efficiency gain, of course with some help from foreign exchange rate. And some program change, including the migration and schedule change, that's response to the market. Some of that will be shifted to the next year.

Donald Lu - *Goldman Sachs - Analyst*

Okay. My second question is on 16-nanometer ramp. Since you talk about it's going to be faster than 20-nanometer, would that imply it will be over 22% I believe in Q1 next year of your total revenue?

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Donald, our 16 FinFET right now, most of the volume come from one single customer. So it will be very difficult for me to give you the exact number and say whether -- that it's a what percentage. Otherwise I release too much of information.

Donald Lu - *Goldman Sachs - Analyst*

Okay. But it will be faster --

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

It will be faster.

Donald Lu - *Goldman Sachs - Analyst*

-- than 20-nanometer.

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Yes, trust what we said.



Donald Lu - *Goldman Sachs - Analyst*

Okay, thank you.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

Next it will be from Citigroup's Roland Shu.

Roland Shu - *Citigroup - Analyst*

Good afternoon. I think that it's unusual for TSMC to have this within quarter pre-announcement and also give the guidance one month ahead of the revenue -- earning release. So just wondering what have you seen by layer and how does it compare with the view now, if it's improving or if it's stabilized or even deteriorating. Thank you.

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

Let me take these questions. The announcement we did on September 23 as a pre-alert, actually we have given better guidance for third quarter. So it's not really regarding the third quarter.

But being a transparent company, we like to be transparent, we feel the expectation for the rest of the year, analyst expectation for the rest of the year may be higher than our forecast. So we feel there's a need to come out and say something. That was the basis for the alert announcement.

Roland Shu - *Citigroup - Analyst*

Okay, so now for the 4Q revenue guidance, the lower end is higher right now than the Company guided a month ago. So does that mean that we are actually seeing more confidence on the demand side?

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

I recall the alert we gave a higher range, a bigger range. I was saying TWD198m to TWD204m. Now the range gets smaller but towards the high-end side. As time goes by we have a more clear picture of what we are looking at in the fourth quarter.

Roland Shu - *Citigroup - Analyst*

And also for the margin, margin forecast, I think in 3Q we have a margin impact by the inventory valuation adjustment and also for this 16-nanometer ramp dilution. So are these going to be the key impact in 4Q or going forward? How about -- is there any margin downside impact upon this one?

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

The inventory is related to the utilization changes, not too much about how big this utilization changes. When there is an upswing there will a negative inventory adjustment. When there is a downswing there will be a positive inventory adjustment. That has been like that for a long time.

The other one is the 16 FinFET dilution. Since we just started ramping, there will be some dilution. We expect the dilution will be smaller next year, about 1 percentage point to corporate average and beyond that it will be less than 1 percentage point. So it will be smaller.

Roland Shu - Citigroup - Analyst

So the whole year, whole year impact will be 1 percentage point.

Lora Ho - Taiwan Semiconductor Manufacturing Co Ltd - CFO

For this year, it's 2 to 3 percentage point. Next year it will be about 1 percentage point. After that, it will be smaller than 1 percentage point.

Roland Shu - Citigroup - Analyst

Okay, thank you. My second question is for the 16-nanometer InFO. So how many percent of the 16-nanometer wafers is adopting InFO packaging next year?

C.C. Wei - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

It's a question is pretty hard to estimate at this time. But I would say it's quite a portion of it.

Roland Shu - Citigroup - Analyst

Okay, so by -- this definition, so how are you going to build your InFO capacity accordingly?

C.C. Wei - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

It's according to customers demand of course.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

Thank you.

Roland Shu - Citigroup - Analyst

I understand. And I think I have one last question, even for the 16-nanometer. Since the 16-nanometer is going to be a long node, same as 28-nanometer, so what is the ultimate capacity you are going to build for 16-nanometer?

C.C. Wei - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

It will be according to customers' demand again.

Roland Shu - Citigroup - Analyst

Thank you very much.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

All right. Next will be -- questions will be coming from the floor. It will be UBS, Eric Chen.



Eric Chen - UBS - Analyst

Okay. My first question, very quickly, Lora, is about the CapEx cut right and how about the capacity plan for the 8-inch. What kind of capacity expansion we should put on our model for this year? And how about the 28-nanometer process? Can you give us update more elaborate?

Lora Ho - Taiwan Semiconductor Manufacturing Co Ltd - CFO

I will talk about the Company as a whole, capacity plan. With the TWD8b CapEx I was talking about, we expect the year-over-year capacity for the TSMC will increase by 12% combined. Mostly of course, the majority is 12-inch.

Eric Chen - UBS - Analyst

So no idea for the 28?

Lora Ho - Taiwan Semiconductor Manufacturing Co Ltd - CFO

I prefer not to disclose individual technology node capacity.

Eric Chen - UBS - Analyst

Okay, thank you. Appreciate it.

And also, Dr. Wei, I remember you talked about the 7-nano fully leverage the 10-nano, the equipment right, over the Dr. Liu, I apologize. That's an interesting point. When you talk about the full leveraging, I mean the compatible around equipment, available to comparable switch from the 10-nano to 7-nano based on your internal plan. Is that correct?

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

Eric, I think your question is asking whether or not there is a lot of common tools between 7 nanometer --

Eric Chen - UBS - Analyst

Yes, right.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

-- and 10-nanometer the way like between 20 and 16-nanometer.

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

Yes, we develop our 7-nanometer with the low cost target. Therefore when we develop this technology we will make use of 10-nanometer equipment as much as possible. At this point, more than 90% of the 10-nanometer tool can be directly used by 7-nanometer.



Eric Chen - UBS - Analyst

How about from the 16 to 10? How many percent? Is that possible to quantify?

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

From 16 to 10 it's lesser requirement because we -- 16 will be a long node and it will be fully utilized. Instead the 10-nanometer will be a shorter node, but therefore we can -- we take particular focus on the tool migration efficiency.

Eric Chen - UBS - Analyst

Okay, that's interesting. For the 16 how you judge it as a long node. If we look at the schedule probably around five quarters, the switch from the 16 to 10 and from the 10 to 7, right, in terms of the geometry migration schedule almost the same. So how you define that 16 is a long node and the -- sorry, the 16 is a long node but 10 is a short node. How do you make such a judgment? Thank you.

C.C. Wei - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

Actually we are working with the customer and then according to their product requirement and also their product roadmap. So customer and TSMC determine that which node will be best performance and best cost effective. So that's why we can say that the 16 FinFET right now it will be a long node as compared with 20-nanometer.

Eric Chen - UBS - Analyst

So more like the survey feedback from the client.

C.C. Wei - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

Yes, that's a between cooperation, TSMC and customers.

Eric Chen - UBS - Analyst

Okay, last question. In terms of the InFO are you going to build on the standard in the industry for the InFO technology?

C.C. Wei - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

We built InFO to meet customers' demand and to fulfill their requirements. We did not think about something else.

Eric Chen - UBS - Analyst

Okay. But you will build out the standard right. I'm sorry. Okay, thank you. Thank you very much.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

All right. Next one will be coming from the floor. It will Morgan Stanley's, Bill Lu.



Bill Lu - Morgan Stanley - Analyst

Hi, thank you very much. So a follow-up on Eric's question on this concept of equipment reuse. I guess first of all, does that change how you depreciate.

And secondly, I'm not sure if you agree but it seems to me like it's not just a one node phenomena, the next several nodes you might have more and more equipment reuse than what you've seen in the past. I'm just wondering if you could tell me whether you agree with that and if you do, what does that mean for your business model as far as return on investment. Thanks.

Lora Ho - Taiwan Semiconductor Manufacturing Co Ltd - CFO

Let me answer the first part of your questions regarding the reuse. Are we changing any depreciation rule? For the manufacturing tool, we use five years straight line depreciation. But there are some called orphan idle tool. That means these tools cannot be converted to next generation. For those tools we use three years. So we specially identify which part cannot be converted.

Actually with the effort from our operation people this non-convertible part becomes smaller and smaller. Mark was talking about, above 90%, actually it's very close to 95% are convertible to next generation.

Bill Lu - Morgan Stanley - Analyst

Sorry, just to be clear, so if you set a tool at 20 and you now convert to 16, the schedule doesn't change on the depreciation if it's converted right.

Lora Ho - Taiwan Semiconductor Manufacturing Co Ltd - CFO

It doesn't change. It doesn't change.

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

Can I ask you what do you mean by business model you have in mind?

Bill Lu - Morgan Stanley - Analyst

I guess I just feel like the smartphone is now such a big part of the overall industry and it's driving a lot of the leading edge. When that starts moving to the next generation, maybe the second wave and the third wave aren't going to be as big as say they used to be, in comparison. And so maybe you convert more of 16 to 10 than you did historically where you kept all those old nodes for a long, long time. I wonder if you see that as a trend and what does that mean for your business model.

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

I think the reason we are very focused on the tool compatibility is indeed what you mentioned. The second wave and third wave, some of them may not catch up as fast as in the past.

But we do this, it's for the maximum effectiveness to provide our technology to our customer. Many of our customer have their products scheduled differently. So some of the customer will ride on -- will have their product launch at a different time than the other. And we pace our technology so that they can take the maximum benefit of a particular set of tools and with the most updated technology capability. And so that's our value to our customers.



But the added burden for us is of course to manage the tool compatibility. And I think we are -- we have the profitability target in mind to ensure that we will keep that.

Bill Lu - *Morgan Stanley - Analyst*

I wasn't exactly clear. I guess what I was getting at is if you have more reuse and more conversion maybe it needs lower capital spending going forward structurally?

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Can you repeat your question or your comments?

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

Want my help? My interpretation of Bill's question is that because we are using a lot of those reuse because of the high common tools and therefore the need for our fresh new capital investments actually the burden is lighter and it should actually help our profitability and return.

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Of course. That's why we want to make it most effective of the tools.

Bill Lu - *Morgan Stanley - Analyst*

How do you quantify that?

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

How do I quantify the effectiveness?

Bill Lu - *Morgan Stanley - Analyst*

Maybe I don't know if you can help me with the amount of reuse today versus say, last generation or how you think about CapEx intensity now versus last generation.

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

The CapEx intensity for each node is for the -- capital intensity is increasing for each node. Therefore we try every way to reduce that and make it more effective to counter that heavy loading. And that's the migration, tool migration is about. If you want me to quantify maybe Lora can help me.

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

Let me try, Bill. Remember this question has popped up quite often. Maybe two or three years ago, we were talking about the conversion rate is more than 70% and then we said it's more than 85% and now we are saying it's above 90% and 95%. That's the effort we made doing this process.



There's many ways. You have to start from the design phases. You have to look at the design. You make sure that tool gets utilized more than one generation, that's one thing. The other one is you need to know how to modify the tool so that you don't have to buy a new one. That's another reason. So there are many, many things happening in the factory and we are giving an aggressive target on this and we measure that.

Bill Lu - Morgan Stanley - Analyst

Thank you. The second question is for Dr. Liu. You had given us some of your new demand drivers which are very helpful. Can you look at how that impacts the foundry industry? If you look at 10-nanometers, how big do you think is the foundry market with these added demand drivers versus say, 16 or versus 28?

I just feel like we've talked a lot about the ramp right, but the ramp is a little bit different now because it's one customer specific. So can you look at the overall margin as it matures?

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

The drivers I mentioned about mostly is to show the demand for the leading edge technology where the computing is hunger for either fast speed or for mobile lowest power. And therefore you can see we benefit more on the leading edge technology compared to other foundry players. And I do see the trend will continue, the leading edge proportion of profit really will increase as time goes.

Bill Lu - Morgan Stanley - Analyst

Do you think 10-nano will be a bigger node than 28?

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

It's too early to tell. I think in the beginning of 28-nanometer, we didn't think 28 is so big either. And I believe as we right now size our capacity only according to our customers' demand. But as time goes on, we may see that differently. And we expect it should be comparable. But at this point at early stage it's indeed much like 28 in the beginning. It's smaller than what 28 is today.

Bill Lu - Morgan Stanley - Analyst

Thank you.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

Okay, I think it's about time that we will take our next question from the call. Operator, please proceed with the next caller on the line.

Operator

Brett Simpson, Arete Research.



Brett Simpson - Arete - Analyst

Yes, thanks very much. I have a question for Lora on FX. Lora, can you just confirm do you sell -- does TSMC sell all of the wafers in US dollars? And on the gross margin side, can you perhaps give us a sense for how cost of sales breaks down between US dollar and Taiwan, so we can understand the movements in FX on the gross margin side.

And maybe for Mark, regarding 16-nanometer and 20-nanometer, so your sales in Q3 combined is just over 20% of sales. How do you see these combined nodes as a percent of sales in 2016 and how might it split between 20 and 16-nanometer? Thank you.

Lora Ho - Taiwan Semiconductor Manufacturing Co Ltd - CFO

Let me answer the first part of the question regarding the foreign exchange rate. Yes, indeed our revenue more than 99% denominated in US dollars.

In terms of purchasing, not so much on cost of sales, in terms of purchasing I think we have about 50% in US dollars and 20% in euro, 20% in TWD and the rest in Japanese yen. So that's the effect of revenue minus the cost impact. As you recall, we have said earlier, 1% FX impact will change our gross margin rate by 0.4 percentage point. This rule of thumb still holds today.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

The second part of Brett's question is combined 16 and 20-nanometer proportion to revenue next year.

C.C. Wei - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

That will be greater than this year I can say, but I cannot have a very accurate number right now to share with you.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

So Brett, you have to wait a little bit longer.

Brett Simpson - Arete - Analyst

Maybe if I can follow up about 2016. I think you talked in the prepared remarks about growing sales next year double digit. And I know you mentioned FX would be a big driver in achieving double-digit growth, revenue growth next year.

But if I look at the market on a US dollar basis, what are the demand drivers you see in 2016 because it's clear the Android smartphone market is having a lot of price pressure and next year the iPhone will have much tougher compares. So what are you most optimistic about in demand and is there a risk leading edge demand may disappoint next year? Thank you.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

So Brett's question is about next year's growth driver, given that smartphones is experiencing very heavy pricing pressure. And it has actually been a pretty significant growth driver for TSMC in the last few years. So what would be the demand driver for TSMC next year?

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

Well, it's still going to be leading edge technology and we see mostly it will still be high-end smartphones.



Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

Brett, maybe I can add a little bit, one element to that. Not only it, it is the smartphones but also TSMC increasing our penetration in the smartphones.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

All right. Next question will still be coming from the line. Operator, could you please go to the next person on the line?

Operator

Mehdi Hosseini, SIG.

Mehdi Hosseini - *SIG - Analyst*

Thank you. Thanks for taking my question. The first question has to do with the first quarter. It seems unusual that your customers' forecasts are still uncertain especially after several quarters of working down inventories. Is it right to assume that this cycle, inventory correction cycle is indeed different than the previous cycles, especially when we look at your cycle time averaging two months and keep in mind that Chinese New Year in February coming and your customers even after several quarters of inventory digestion are still not willing to refresh inventories? I want to get more insight from you on this factor and I have a follow up. Thank you.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

All right. So Mehdi let me repeat your question. Basically you're a little bit surprised by the length of time that our customers is going through the inventory digestion. As you said that it has already been going on for several quarters. And then given the cycle time it is about average two months, why do -- why does TSMC still have certain uncertainty about the first quarter next year?

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Okay. Let me answer about the inventory in a -- for the whole year. For TSMC as you recall our first year -- first quarter is a pretty good quarter. It's flat typically in Q4. Q1 is a weaker quarter. Then we find out that actually the first quarter the inventory is -- actually is higher than the -- than seasonal normal by several days.

And then we were thinking of how this inventory will work down. But unfortunately the demand in China turned sour during the first and going into second quarter, coming down very fast. That surprises us. Therefore -- our customers too. Therefore, the inventory really didn't work down that well. As a matter of fact, it actually increases. So that puts everybody -- uncertain on the inventory.

And we look at the Q3, I think Q3 traditionally is a strong quarter and the people still didn't really cut down their inventory that boldly. And therefore we see at the end of Q3 it still didn't come down too much.

And however, from the current global economy and perspective, people really put it the realistic view and we look at the Q4, indeed people are actively adjusting inventory just like several other years and they try to reach the inventory towards the seasonal level. And that's why we see the weaker, particularly weaker Q4. And that's the situation.

So this year is very different than last year and I hope it's not going to replay next year.



Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

So Mehdi --

Mehdi Hosseini - *SIG - Analyst*

And then as a follow up, the second question, I want to revisit the 10-nanometer. In the past you have suggested that 10-nanometer contribution would start in Q4 of 2016. Is that forecast still remaining the same? And if the InFO would start generating \$100m per quarter, is that part of the 10-nanometer or should we account the InFO as an additional line -- source of revenue?

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

All right. Mehdi's question is will we as we said before begin to see revenue contribution from 10-nanometer starting in fourth quarter 2016. And then whether or not the \$100m quarterly revenue by 4Q 2016 from InFO included the 10-nanometer revenue.

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

I'll answer the first question. Yes, we did one time talk about we want to enable customers' production at the end of 2016. But the first customer we have that's played it in a conservative way and they didn't set the most aggressive schedule. And they put the production of 10-nanometer as planned as their product plan, according to their product plan. And that plan has not changed and we continue to develop technology to produce the best quality 10 to fit that schedule still.

So we talk about we're going to freeze this technology this quarter and going about the qualification and prepare to the same production schedule of 10-nanometer next year.

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

I'll answer the second question, the second part of this question on InFO's revenue next year. In the fourth quarter, as I stated, it will be more than \$100m per quarter by InFO alone, not with the silicon wafer or others.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

Okay. Let's now coming back to the floor. Next question will be coming from the floor, a follow-up from Credit Suisse, Randy Abrams.

Randy Abrams - *Credit Suisse - Analyst*

I wanted to ask a follow-up. Just -- you mentioned about InFO \$100m. Could you talk about the scope of the whole back-end business because you're also doing bumping, CoWoS, maybe the size of the back-end business? And as InFO ramps, what do you see as potential, if you have any aspirations? How big you think it could be 12 to 18 months from now?

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

InFO's revenue will be part of the whole back-end and certainly the back-end business is much bigger than this \$100m per quarter. As far as how big it is that will depend on our demand from the customer for next year. So I cannot give you roughly a right number right now.

Randy Abrams - *Credit Suisse - Analyst*

The second follow-up question, we got a lot of reuse this year. Could you talk about for next year, the 20/16, are you through with that reuse or do you see potential to get some savings from 20/16 or from some of the prior nodes? So do you think next year could be a year you get some of those reuse?

And then if we're looking at CapEx of TWD10b this year -- sorry, TWD8b this year, what that means for depreciation and for next year, if it's going to be a much more modest increase on depreciation?

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Randy, I did not catch up your first part of reuse. Reuse of what?

Randy Abrams - *Credit Suisse - Analyst*

Sorry, for the capacity. If you convert more capacity next year, if you see more CapEx savings from converting 20 to 16 or some of your prior nodes like 28 or lagging nodes to reuse and move tools down. If you think next year is another year to reuse CapEx or reuse capacity to save CapEx next year.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

In other words he's asking whether the conversion between 20-nanometer to 16-nanometer will continue into next year and whether there will be other type of conversions, for example converting from 28-nanometer to some other nodes also occurring next year.

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

We continue to convert 20-nanometers capacity into 16 FinFET to meet the customers' demand, I described in my presentation.

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

And if I can make some comments on this, actually the conversions depend on the demand on those two technologies and it is an ongoing process. Obviously we have started conversion this year and it will depend on next year's demand. If there's a need, we will convert, continue doing that.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

On depreciation.

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

Depreciation, I can talk about this year first. This year we expect with TWD8b CapEx, depreciation is going to go up by about 11% to 12%. And next year since we have not fixed the CapEx yet, but it will not be a very high number either.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

Okay, next questions will be coming from HSBC, Steven Pelayo.

Steven Pelayo - HSBC - Analyst

Just a couple of quick follow-ups here. You mentioned that 16 and 20 combined will definitely grow year on year. I'm just curious in terms of sequential trends, it's about 21% of revenues. Does that grow every quarter, when you look into Q4 and Q1?

C.C. Wei - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

It will grow year on year but I cannot comment on the quarter. Alright?

Steven Pelayo - HSBC - Analyst

Okay, fair enough. Three, four, five years ago, I think Chairman mentioned that the one number that really summarized it quite cleanly and easily for us was that with this move to smartphones, we were going to see a tripling of the silicon content per phone. And lo and behold, it's really what drove TSMC on top with some share gains and really no Intel in this mobile phone world.

I guess as I'm thinking over the next three, four, five years, you guys are highlighting Internet traffic and even that's only 11m servers a year, not really that big. Cars are only 60m, 70m cars per year. So it's very difficult I think for us now to really see something that can be as significant, even with a sizeable market and the silicon content increase potential.

So I guess when you're thinking out over the next three four years or so, what do you think are the biggest drivers? What's that same driver that we saw five years ago like we saw with smartphones? What excites you most I guess? And can you quantify it a little bit to a simple sentence like that?

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

Steven, this is a tough one. I mentioned all the trends of computing. Actually in IoT mostly growth will come from computing because the sensor and connectivity are more mature technologies. There is nothing, killer apps as the smartphone today. But as you know, all the computation demand, some of the usage model come and goes. It wasn't successful. For example, we're still yet to know whether the watch will becoming a usage -- people will get used to it or not, drone or other things, home devices.

So I just don't have a clear naming for that gadgets. But I think what I can say is just like five years ago, the connectivity and communication is a definitive trend. Therefore, we see the smartphone will come and indeed it did. It does pay.

However, going forward how this computation come into what form of gadgets, actually I cannot clearly describe to you. But if you -- people still talk about their -- the smartphone in their pockets is too hot or doesn't take enough, long enough time. And let alone any virtual reality or augmented reality can be feed through your smartphone. Your smartphone would die within one hour if you're doing that.

Your entertainment, people would like to watch 3DTV, but really the kids today are really looking at entertainment of a different form. They want to evolve into the virtual reality and that could be the future form of entertainment. Do we call that movie theater? Maybe. But it could be different names.

So the gadgets is still upon the innovator of the product industry to come out. But I think looking at our customers, there are tons of innovators that are thinking come out new products to becoming a next smartphone. But they produce their design continuously. Let's see how it will -- that will pan out to be a particular gadget for a particular successful innovator.



Steven Pelayo - HSBC - Analyst

Sorry, if I can just do one more quick one. When will 10-nanometer debut its revenues? As you said, it was 16-nanometer this quarter. I know you have tape outs coming out in 10-nanometer mid next year. Is that -- do we wait until 2017 before it's a few percentage of revenue or do we think it actually can contribute a few percent by the end of next -- 2016?

C.C. Wei - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

We will start production maybe the fourth quarter next year. But revenue we expect from year 2017 in the first quarter it will be --.

Steven Pelayo - HSBC - Analyst

Okay, thank you.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

All right. Questions will be coming from Deutsche Bank's Michael Chou.

Michael Chou - Deutsche Bank - Analyst

Thank you. Could you give some color for 10-nanometer scaling versus 16-nanometer? 10-nanometer scaling.

Elizabeth Sun - Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications

Scaling. You mean compared to 16, density and so on.

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

Yes, two points. Let me comment on that. 10-nanometer scaling we designed it very aggressively. Typical node to node scaling is -- if we talk about logic density, it's about 1.9 times scaling. I just showed you the number. The 10-nanometer we designed to 2.1X scaling from 16 FinFET plus.

Michael Chou - Deutsche Bank - Analyst

Second one is, as you mentioned, your 10-nanometer risk production should be Q1 next year or Q4. Okay. So after one year risk production so we should expect that you can enter mass production in 2017.

Mark Liu - Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO

Yes.

Michael Chou - Deutsche Bank - Analyst

So based on your R&D programs for your customer, do you think you can meet the customer scaling requirements in this moment?



Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Yes, we can. The tape out is imminent.

Michael Chou - *Deutsche Bank - Analyst*

Thank you.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

Okay, follow up questions again coming from Citi's Roland Shu.

Roland Shu - *Citigroup - Analyst*

Just one follow-up question for the depreciation. Lora said that depreciation based on TWD8b CapEx spending in this year, depreciation will be above 11% to 12% and you said 2016 will not be a very high number. You mean the depreciation or CapEx?

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

I said CapEx will be higher than TWD8b and depreciation year over year will not be a very big number compared to the changes of this year versus last year.

Roland Shu - *Citigroup - Analyst*

Okay. So this low -- less spending, depreciation and also the macro uncertainty this year and next year. So are you still holding your long-term financial goal for PBT to grow more than 10% for the next five years? Does this goal still hold?

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

10% is a good goal.

Roland Shu - *Citigroup - Analyst*

Yes. But I think previously you talked about this on your long-term goal.

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

It's long term. I'm talking about five-year goal, 10%.

Roland Shu - *Citigroup - Analyst*

So it still holds.

Lora Ho - *Taiwan Semiconductor Manufacturing Co Ltd - CFO*

This goal still holds, but we need to work on it.

Roland Shu - *Citigroup - Analyst*

Okay, thank you.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

All right. So there is also a follow-up question from Morgan Stanley's Bill Lu.

Bill Lu - *Morgan Stanley - Analyst*

Hi. Just two very quick follow-ups. One is, I think Dr. Wei talked about the second generation InFO that's under development, second generation InFO. Is that still targeted for the mobile processors or is it for new applications?

C.C. Wei - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Probably it will be adopted by the mobile processor first and then applied to all other applications. We are working with many customers right now. So in fact I cannot really tell you which one will be the first one to use it.

Bill Lu - *Morgan Stanley - Analyst*

Secondly, can you give us update on EUV. There seems to be some talks recently that you may be exploring other options besides EUV?

Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

Okay, let me comment on EUV. In the past three months, we see quite encouraging progress of EUV development and we work on our 3300 tools from ASML and to improve their source chamber and the targets and very good progress.

Therefore we have agreed to go along -- go further to moving the 3350 tools. And that tool has made also major modifications and we plan to move that in, in the January next year, so that to catch up. Not only accelerate development, but also catch up on the 5-nanometer development program.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

Follow-up questions from JPMorgan's Gokul.

Gokul Hariharan - *JP Morgan - Analyst*

Thanks. Just one follow-up question. Dr. Liu mentioned that the fabless, system fabless companies, the new breed of companies are becoming bigger and bigger. Could you talk a little bit about what kind of customers are these? Currently obviously there are a couple of them which are really big and primarily in the mobile space. Are we seeing expansion of these companies towards other areas as well, maybe datacenter and that kind of areas as well?



Mark Liu - *Taiwan Semiconductor Manufacturing Co Ltd - President & Co-CEO*

I cannot name the company's name for you, but let me share with you the thoughts. Actually this phenomenon is not new. Today of course, the smartphone you refer to mobile space, a lot of system companies does come out and create a new momentum for the demand market. In other areas like game for example. And it's produced by the system companies and they will -- we will see other areas for the virtual reality for example.

Some of that probably will be driven by the system companies. And cars for example, the machine learning, that probably will also be driven by fabless and system company together. So this is a -- we see there's a definitive trend that system development -- developers could not find the standard product on the market, therefore they evolve in the design to optimize their system hardware and software to create more innovative products. And that we see and that's really encouraging is where the new players of innovation in the semiconductor industry emerges.

Elizabeth Sun - *Taiwan Semiconductor Manufacturing Co Ltd - Director of Corporate Communications*

I think it's about time that we should end this quarter's conference call and thank you for coming over for today's conference. Please be advised the replay will be available in three hours from now, transcripts 24 hours from now, both of which will be available through our website at www.tsmc.com.

Thank you for joining us today. We hope you will join us again next quarter. Goodbye and have a good day.

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