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Earnings Call

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OVERVIEW:

2330 reported 1Q15 revenues of TWD222b and EPS of TWD3.05. Expects 2Q15 revenues to be TWD204-207b.



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PRESENTATION

Elizabeth Sun - TSMC - Director of Corporate Communications

Welcome to TSMC's first-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 dial-in number -- your dial-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 first quarter followed by our guidance for the current quarter. Afterwards, TSMC's two Presidents and Co-CEOs, Dr. Mark Liu and Dr. C.C. Wei, will jointly provide a couple of 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 uncertainties 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 press release.

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



Lora Ho - TSMC - SVP & CFO

Thank you, Elizabeth. Good afternoon, everyone. Thank you for joining us today. My presentation will start with financial highlights for the first quarter and followed by the guidance for the second quarter.

First let me summarize our first-quarter performance. In first quarter we have achieved TWD222b in revenue, 49.3% gross margin, 39% operating margin and TWD3.05 in EPS, which are all within our guidance range.

On a year-over-year basis, first quarter showed very strong growth versus last year. Our revenue increased 50%. Gross margin and operating margin went up by 1.8 percentage point and 3.6 percentage point respectively. Net income and EPS both increased 65% versus the same period last year.

On a sequential basis, the wafer demand for the first quarter remained strong. But NT dollar was stronger than the assumption in our first-quarter guidance by about 1%, which reduced our revenue by TWD1.9b. Despite that, our first-quarter revenue remained essentially flat versus fourth quarter last year.

On the profitability side, gross margin was slightly lower than fourth quarter, mainly due to lower capacity utilization, offset by cost improvement, favorable inventory valuation adjustments and a favorable foreign exchange rate.

Let's take a look at the revenue by application. During the first quarter, communication and computers declined 9% and 10% sequentially, while consumer and industrial increased 32% and 19% respectively.

By technology, 20-nanometer revenue contribution decreased from 21% in the fourth quarter last year to 16% in the first quarter this year due to key customers' product seasonality. Meanwhile customers' demand for our 28-nanometer wafers remained solid and contributed 30% of wafer revenue. Accordingly, these two advanced technologies, 20-nanometer and 28-nanometer, represented 46% of our first-quarter wafer revenue, 5 percentage points lower than the fourth quarter last year.

Now let's move on to the balance sheet. On the asset side, cash and marketable securities increased TWD82b to a record level of TWD519b at the end of the first quarter.

On the liability side, current liabilities decreased by TWD13b as we paid down TWD17b of short-term bank loans. As cash continued to increase, the debt ratio has come down from 30% level in the past two years to 28% in the first quarter.

Working capital remained healthy. The accounts receivable turnover days decreased 3 days to 44 days. Days of inventories decreased by 1 day to 57 days.

Now let me make a few comments on cash flow and CapEx. During the first quarter we generated TWD156b cash from operations and invested TWD49b in capital expenditure. As a result, free cash flow reached a record level of TWD107b and cash balance increased to TWD437b or about \$14b at the end of the first quarter.

So I have finished my report of the financial part. Now let's turn to the second-quarter outlook.

In the second quarter, a combination of the key customers' business loss to a captive IDM; inventory adjustment, which will be explained in more detail by Mark; and less favorable exchange rate, all three will negatively impact our business. Based on our current business outlook and the forecast exchange rate of TWD31.03, we expect our second-quarter revenue to be between TWD204b and TWD207b, representing a 7% to 8% Q-over-Q decline.

Gross profit margin to be between 47.5% and 49.5%. And operating margin to be between 36.5% and 38.5%.



Here I will give you a reminder about tax. As you know, in every second quarter we will need to accrue a 10% tax on undistributed retained earnings. As a result, our quarterly tax rate in this second quarter will go up to 24%. I also want to inform you that the approximately TWD15b gain from ASML share disposal is not a taxable item. After the second quarter, the tax rate will fall back to 11% in the third and fourth quarter and our full-year tax rate will be about 14%.

In addition to the second-quarter guidance, I will also update you on our CapEx. Our 2015 full-year CapEx will be reduced by \$1b. So we now expect our CapEx this year will be between \$10.5b and \$11b.

The reduction mainly came from two areas. The first area, we have continually improved our capital efficiency, which allows us to spend less but still achieve the same capacity. And we are migrating our 20-nanometer to 16-nanometer faster, which allows us to convert more of the 20-nanometer tools to be used for 16-nanometer at a lower CapEx.

The \$1b CapEx reduction will not affect our overall capacity build-up for the whole year. We will increase our 16 capacity while decrease our 20-nanometer capacity.

Finally, despite of the lower second quarter, we expect revenue for the second half of the year will recover and the full year will be double-digit growth over 2014.

This concludes my remarks. Thank you very much.

Elizabeth Sun - TSMC - Director of Corporate Communications

Now our two Presidents and Co-CEOs will deliver the key messages. We'll start with Mark.

Mark Liu - TSMC - President & Co-CEO

Good afternoon. I will deliver the key messages.

First on the near-term demand. The demand of TSMC wafers remained strong in the first quarter. This led to our 1Q quarterly revenue to be essentially flat from fourth quarter last year.

In the second quarter, some of our customers appear too optimistic on their own market outlook. As a result, the inventory level of them appeared to be higher than they planned. Recently we saw several mobile customers cut back their delivery schedule because their demand did not come to what they anticipated. Therefore we forecast our second-quarter demand will be below normal and quarterly revenue will decline by about 7% to 8% from first quarter.

Our near-term market demand will then be more moderate than we estimated in January. We now estimate fabless companies exit the first quarter with inventory days higher than seasonal level. However, we think it will be back to normal towards the end of second quarter this year.

So forward looking for full year, we will be continuously working on a double-digit revenue growth year for 2015.

Next I want to comment a few on our long-term outlook. TSMC target our long-term revenue, CAGR compound annual growth -- average growth rate to be 10% in the next five years. We intend to maintain our structural profitability and the net profit growth will be in line with revenue growth.

The continuous demand of more functionality and integration in smartphones drives for more silicon content. We expect smartphones will continue to drive our growth in the next several years.



In the meantime, we see IoT appears us -- present us new growth opportunities. The proliferation of IoT not only will bring us growth in the sensor, connectivity and advanced packaging areas, the associated application and services, such as big data analytics, will also further our growth in the computation space, including application processor, network processor, image processor, graphic processor, microcontroller and other various processors. That was the long-term outlook.

I'll update some of our 10-nanometer development progress. Our 10-nanometer technology development is progressing well. Our technology qualification remains in Q4 this year.

Recently we have successfully achieved fully functional yields of our 256-megabit SRAM. Currently we have more than 10 customers fully engaged with us on 10-nanometer. We still expect to have 10-nanometer volume ramp in fourth quarter 2016 and to contribute billing in early 2017.

This technology adopts our third-generation FinFET transistor and have scaling more than one generation. Its price is fully justified by its value for various applications, including application processor, baseband SoC, network processor, CPU and graphic processors. Its cost and price ratio will comply to our structural profitability considerations.

As for new technology development at TSMC, I'd like to start with -- to update you our 7-nanometer development. We have started our 7-nanometer technology development program early last year. We also have rolled out our 7-nanometer design and technology collaboration activity with several of our major customers. Our 7-nanometer technology developments today are well in progress.

TSMC's 7-nanometer technology will leverage most of the tools used in 10-nanometer, in the meantime achieve a new generation of technology value to our customers. The 7-nanometer technology risk production date is targeted at early 2017.

Now I would like to give you an update on EUV. We have been making steady progress on EUV. Both our development tools, we have two NXE 3300 have been upgraded to the configuration of 80 watt of EUV power, with an average wafer throughput of a few hundred wafers per day. We continue to work with ASML to improve tool stability and availability. We also are working with ASML and our partners on developing the infrastructure of EUV, such as masks and resists.

Although today the process on record of both 10-nanometers and 7-nanometer are on immersion tools, with innovative multiple patterning techniques, we will continue to look for opportunity to further reduce the wafer cost and simplify the process flow by inserting EUV layer in the process.

Now I'd like to give you an update of our recently announced ultra-low-power technologies. We have offered the industry's most comprehensive ultra-low-power technology portfolio, ranging from 55-nanometer ULP, 40-nanometer ULP, 28-nanometer ULP, to the recently announced 16 FFC, a compact version of 16 FinFET Plus, enable continual reduction of operating voltage and power consumption. Today more than 30 product tape-outs planned in 2015 from more than 25 customers.

This 55- and 40-nanometer ULP will be the most cost-effective solution for low- to mid-performance wearable and IoT devices. The 28 ULP and 16 FFC will be the most power-efficient solution for high-performance IoT applications. In particular, our 16 FFC offers the ultra-low-power operation at a supply voltage of 0.55 volts, with higher performance than all of the FD-SOI technologies marketed today.

Lastly I'll give you an update of our recent IoT specialty technology development. We have developed the world's first 1.0-micron pixel size 16-megapixel CMOS image sensor, with stacked image signal processor, which was announced in March by our customer for the next-generation smartphone.

Secondly, we continue to drive the best low resistance in BCD technology roadmap, from 0.18 micron to 0.13 micron and from 8-inch to 12-inch production for wireless charging and fast wired charging of mobile devices. We continue to extend our 0.13 BCD technology from consumer and industrial applications to automotive-grade electrical system control applications.

Lastly, recently we have started production in foundry's first 40-nanometer industrial embedded Flash technology that was started from November last year. And this technology recently passed automotive-grade qualification, that was in March, for engine control applications.

That was my update of new technology. Now I'll hand the podium to C.C.

C.C. Wei - TSMC - President & Co-CEO

Okay. Thank you, Mark. Good afternoon, ladies and gentlemen. I will update you the 28-nanometer, 20 and 16 FinFET status and also our InFO business.

First, 28-nanometer. This is the fifth year since TSMC's 28-nanometer entered mass production. 28-nanometer has been a very large and successful node for us. Our market segment share at this node has held up well and is in the mid-70s this year. We expect this to continue in year 2016. In comparison, this is better than what we had in the 40-nanometer node.

The demand for 28-nanometer is expected to grow this year due to the growth of mid- and low-end smartphones and as well as the second-wave segment, such as radio frequency, circuit product and the Flash controllers that migrate into this node.

However, due to some customers' inventory adjustments, which we believe is only going to be for the short term, the demand for 28-nanometer in the second quarter will be lower than our previous quarter, resulting in 28-nanometer capacity utilization rate to be in the high-80s range. But we expect the utilization rate of the 28-nanometer to recover soon and to be above 90% in the second half of this year.

While we are in the mass production, we also continue to improve the performance of our technology. Last year we have introduced our 28-HPC, which is a compact version of 28-HPM. For the purpose of helping 64-bit CPU conversion for mid- to low-end market, this year we further improved the 28-HPC to 28-HPC Plus. For comparison, 28-HPC Plus will have 18% power consumption -- lower power consumption at the same speed or 15% faster speed at the same kind of power.

As for the competitive position, we are confident that we will continue to lead in performance and yield. So far we do not see there is a very much effective capacity in High K metal gate at 28-nanometer outside TSMC. And since we have already shipped more than 3m 12-inch 28-nanometer wafers, the learning curve has given us an absolute advantage in cost.

Now let me move to our 20 SoC. TSMC remains the sole solution provider in foundry industry for 20-nanometer process. Our yield has been consistently good after a very successful ramp last year. But recently we have observed customers' planned schedule for product migration from 20 nanometer to 16 FinFET started sooner than we forecasted three months ago.

As a result, even we continue to grow 20-nanometer business in the second quarter of this year, our earlier forecast of 20-nanometer contributing above 20% of total wafer revenue this year has to be revised down by a few points to a level about the mid teens. That being the case, we still forecast the revenue from 20-nanometer will more than double that of year 2014's level.

Now 16 FinFET. The schedule for 16 FinFET high-volume production remains unchanged. We will begin ramping in the third quarter this year. And the ramp rate appeared be faster than we forecasted three months ago, thanks to the excellent yield learning that we can leverage our 20-nanometer experience and also due to a faster migration from 20-nanometer to 16 FinFET.

In addition to good yield, our 16 FinFET device performance also met all products' specs due to our very good transistor engineering. So we believe our 16 FinFET will be a very long-life node due to its good performance and the right cost. This is very similar to our 28-nanometer node.

We are highly confident that our 16 FinFET is very competitive. As we've said repeatedly, combining 20-nanometer and 16-nanometer, we will have the largest foundry share in year 2015. And if we only look at 16-nanometer alone, we still can say TSMC will have the largest 16- or 14-nanometer foundry share in year 2016.

Now let me move to our InFO business update. The schedule to ramp up the InFO in second quarter next year remains unchanged. We expect InFO will contribute more than \$100m quarterly revenue by next year, fourth quarter next year, when it will be fully ramped.

Right now we are building a new facility in Longtan, that's a city very near to Hsinchu, where our headquarters are, for ramping up InFO. Today a small product line is almost complete and it's ready for early engineering experiment. This pilot line will be expanded to accommodate the high-volume ramp in year 2016.

And that's all. Thank you for your attendance.

QUESTIONS AND ANSWERS

Elizabeth Sun - *TSMC - Director of Corporate Communications*

All right. Thank you, C.C. This concludes our prepared statements. Before we begin the Q&A session, I would like to remind everybody to limit your questions to two at a time, so to allow all participants an opportunity to ask questions.

Questions will be taken both from the floor and from the call. Should you wish to raise your question in Chinese, I will translate that to English before our management answers your question.

For those of you on the call, if you would like to ask a question, please press the star and then 1 on your telephone keypad now. Questions will be taken in the order in which they were received. If at any time you would like to remove yourself from the questioning queue, please press the pound or the hash key.

Now let's begin the Q&A session. Our first question comes from -- I see Andrew first, so Barclays, Andrew Lu.

Andrew Lu - *Barclays - Analyst*

Thank you, Mark and C.C. Wei and Lora. I have a couple of questions. Thank you, Dr. Sun, because I haven't picked as the first one for a very, very long time.

Earlier C.C. Wei mentioned 16 FinFET ramp-up was faster than earlier expected a few months ago. So can you give us some color on the revenue contribution by Q4? I suppose it should be also a few percentage points higher than a few months ago. I think earlier guidance is 9%, high single digit for Q4 revenue contribution from 16 FinFET.

C.C. Wei - *TSMC - President & Co-CEO*

Andrew, I think you already answered the question by yourself, a few percentage more.

Andrew Lu - *Barclays - Analyst*

So no precise number, like 12% or 15% or something like that?

C.C. Wei - *TSMC - President & Co-CEO*

That's too specific.



Andrew Lu - *Barclays - Analyst*

Okay. My second question for Mark. I think Mark presented at the Technology Symposium in San Jose mentioned that 16 FinFET versus competing technology is about 10% performance better. So can you elaborate what's 10% performance better? If our die size is larger than our competitors, how can we get the 10% performance better? Thank you.

Mark Liu - *TSMC - President & Co-CEO*

In the conference we talked about 16 FinFET Plus. That is our second-generation FinFET transistor. In that we improved our transistor performance a great deal. According to our information, that transistor speed, talk about speed at fixed power, is higher than the competitor by 10%. That's what I meant.

Andrew Lu - *Barclays - Analyst*

So how? Because of the transistor?

Mark Liu - *TSMC - President & Co-CEO*

Yes, the transistor structure, transistor engineering.

Andrew Lu - *Barclays - Analyst*

Compared to competing -- is the competing the current competitor's solution or the next-generation competitor's solution? For example, LPE versus LPP or something like that?

Mark Liu - *TSMC - President & Co-CEO*

The fastest one. The fastest.

Andrew Lu - *Barclays - Analyst*

Their best one?

Mark Liu - *TSMC - President & Co-CEO*

Yes.

Andrew Lu - *Barclays - Analyst*

Thank you.

Elizabeth Sun - *TSMC - Director of Corporate Communications*

All right. Next question will go to Bank of America-Merrill Lynch, Dan Heyler.



Dan Heyler - BofA Merrill Lynch - Analyst

Thanks. Thanks, Elizabeth. So a couple of quick questions. Congratulations on the 16-nanometer success and faster yield ramp than previously planned. As you go to convert your 20 capacity to 16 due to those better yields, I guess two parts to the question.

What's the implication on margin as you're converting a fab from -- I know you do this a lot, but this is a big transition with limited products. So as you're going from 20 to 16, what are the implications on margin? Can you -- do you take maybe one-quarter hit on margin before you get back to trend? Thank you.

Lora Ho - TSMC - SVP & CFO

Dan, I will firstly talk about the implication for CapEx, probably that's the more important which will lead to the margin in a later stage. You know conversions, it costs less than adding new capacity. So when we see a node need to be converted, if we can do it faster, that means we can spend less CapEx. That's actually how this \$1b reduction coming from.

In terms of margin, actually it has multiple factors. Depreciation, of course, being number one. Other thing is how fast can you bring up your yield and how does economic scale get into play. So from what we have seen right now, we believe the 16-nanometer margin will begin better than our 20-nanometer margin because we have the basis of 20-nanometer.

So as we have said many times, we don't want to separate 20 versus 16 and always -- you guys always ask 20 margin and 16 margin separately. So I would say if we combine 16 and 20 margin, it will be a pretty good progress. And we have seen 20 has progressed quite well and 16 will be even better.

So although this 20 plus 16 will still have some small dilution to TSMC in the year in 2015 and 2016, for 2015 maybe 2 to 3 percentage point, in 2016 will be 1 to 2 percentage points, but we are targeting to achieve corporate level margin by year 2017.

Dan Heyler - BofA Merrill Lynch - Analyst

Okay. Thank you. And then just as a quick follow-up on that, does 20-nanometer still grow from its lower level in the first quarter sequentially? Will it -- in absolute dollar terms, can you maintain the current level throughout the year? I think you've implied that in your guidance. I think you said mid-single digit, just to confirm that. And is that throughout the year? Does 20 stay at about 15% of revenue throughout the year?

C.C. Wei - TSMC - President & Co-CEO

Dan, would you please repeat your question again?

Dan Heyler - BofA Merrill Lynch - Analyst

Do you think 20-nanometer will remain at the current revenue level throughout the year? Given that some customers are not successful in 20 products and maybe didn't succeed and some customers are more successful. So if you put everything together, I'm wondering if 20 stays at the current revenue level.

C.C. Wei - TSMC - President & Co-CEO

In my statement I say that contributing 20% revenue cannot hold because of our customers' demand. But I also say that second quarter we continue to increase the 20-nanometer business, so that means in the second half, no, we cannot maintain that same level of business.

Dan Heyler - *BofA Merrill Lynch - Analyst*

In dollar terms.

C.C. Wei - *TSMC - President & Co-CEO*

In dollar terms.

Dan Heyler - *BofA Merrill Lynch - Analyst*

Okay, cannot. Okay. And then my second question is relating to 20-nanometer. Here you certainly have a lot of growth in 16, with customers taping out aggressively, especially next year. Given your high share at 28, how do you keep 28 full? You obviously have a lot of technology there. Customers will move forward.

So I'm wondering, could you elaborate on new areas that are actually creating new demand at 28, such that you can continue to grow 28 next year. And do you think you can grow? I think previously you said maybe hold it at current levels even with 16 growing. So just maybe revisit that question. Thank you.

C.C. Wei - *TSMC - President & Co-CEO*

Okay. To answer the question, I think the high-end smartphone will move to 16 FinFET. However, the mid- to -- and lower-end smartphones will stay in the 28-nanometer because that's very cost effective. And mid- and low-end smartphone continues to grow significantly. So that will give a very strong demand on 28-nanometer. In addition, we still have a second-wave product, like RF and Flash controller, as I use as an example, move into 28-nanometer.

So summing it up, I think the 28-nanometer's demand continue to grow while we move into the 16 FinFET for high-end smartphone.

Dan Heyler - *BofA Merrill Lynch - Analyst*

Excellent. Thank you. And is there an element of -- as you add value on 28-nanometer -- as you add value, is there an element of being able to hold pricing there because it's an old node and all the old nodes face pricing pressure. And I think we get a lot of questions from investors on old nodes getting pricing pressure. But at the same time you're adding a lot of value there. So maybe give us a little bit of sense of the 28-nanometer kind of pricing environment next year. Thank you.

C.C. Wei - *TSMC - President & Co-CEO*

All I can say is we remain more competitive -- very competitive in our value proposition. That gives you some idea about the capacity support, the yield and performance and also including pricing. But all combined together, we are better than the competitor.

Elizabeth Sun - *TSMC - Director of Corporate Communications*

All right. Next the questions will be coming from Deutsche Bank's Michael Chou.



Michael Chou - *Deutsche Bank - Analyst*

Hi. Two questions. First one is for EUV. As Mark has highlighted your EUV program, Does that imply you may consider using EUV in the second stage of your 16-nanometer -- 10-nanometer ramp-up, potentially in 2018 or 2019? Thank you.

Mark Liu - *TSMC - President & Co-CEO*

Yes, we always look for opportunity to insert EUV in both 10-nanometer and 7-nanometer. The EUV technology provides not only some cost benefit, but also simplify the process. That means you can replace multiple layers with one layer that helps your yield improvement. So there's opportunity both in quality and cost always exist so long as EUV's productivity comes to the threshold point.

And in -- as you noticed on 10-nanometer, our capacity build will largely done in 2016 and 2017. So 2018 will be inserted, if inserted, will be combined with some other tools upgrade, some tool upgrade to 7, for example, and replaced by the EUV tools. In that node it will not be a fresh capacity build with EUV at that time because that's a little bit late in the schedule for the 10.

7-nanometer, of course it will be higher probability adopting EUV. And the benefit will be bigger because the 7-nanometer has a lot of multiple layers, quadruple, even multiple patterning layers, thus EUV can be more effective in reducing the cost and improve the yield, for example. So that's our current status.

But today EUV is still in the engineering mode. The productivity, as you heard, will still have some gaps for practical insertion of the technology. So we're still working on that, in that mode. And we have -- although we have one-day performance up to 1,000 wafer per day, but I was talking about average still a few hundreds. And we need to get to more than 1,000 to consider a schedule to put it into the production.

Michael Chou - *Deutsche Bank - Analyst*

Thank you. Second question is regarding the outlook by segment. That's for CFO. Outlook by segment in Q2.

Lora Ho - *TSMC - SVP & CFO*

Q2?

Michael Chou - *Deutsche Bank - Analyst*

Yes.

Lora Ho - *TSMC - SVP & CFO*

Okay. Q2, I have just said, there will be 7% to 8% decline. I think mainly it's in -- from communications segment. As you can see in my presentation, communication, industrial and standard, both segments constitute about 80% of TSMC revenue. So the decline mainly come from those two segments.

Michael Chou - *Deutsche Bank - Analyst*

Thank you.



Elizabeth Sun - TSMC - Director of Corporate Communications

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

Eric Chen - UBS - Analyst

Hi, Mark, C.C. Wei, Lora and Elizabeth. Okay. My first question probably go to Lora regarding to the CapEx. You just mentioned we cut the CapEx by \$1b but we will maintain our capacity schedule. How about for the 28-nanometer process in terms of the capacity, in terms of the CapEx for the 28-nanometer process? The schedule is going to change?

Lora Ho - TSMC - SVP & CFO

We only spent very little money on 28, especially in the first half, to add capacity. In addition to that then we have continued productivity improvements. So on overall year, 28 capacity will still grow.

Eric Chen - UBS - Analyst

How many percent year-on-year growth are we talking about?

Lora Ho - TSMC - SVP & CFO

Well I will not specify the percentage, but it's still growing with the combination of both.

Eric Chen - UBS - Analyst

Okay. To maintain the original schedule, right?

Lora Ho - TSMC - SVP & CFO

Yes.

Eric Chen - UBS - Analyst

Okay. How about the depreciation growth given we cut the \$1b CapEx?

Lora Ho - TSMC - SVP & CFO

I think I have said in last quarter we expect total depreciation will be -- increase will be around 20%. With this \$1b cut down, the increase will be in high teens, will not be 20%.

Eric Chen - UBS - Analyst

Okay. High teens. Okay. The other question probably go to Mark or C.C. Wei regarding to the -- our investment in China. Any update or any improvement or any logic behind? And some newspaper talk about we would like to build a fab of our own. So any strategy behind? Thank you.

Lora Ho - TSMC - SVP & CFO

Okay. Let me take this one.

Eric Chen - UBS - Analyst

Okay.

Lora Ho - TSMC - SVP & CFO

You know we have an 8-inch fab and it's running very well in Shanghai and it's making profit. And we are growing our China business quite nicely in the past few years. Now it accounts about 5% of TSMC revenue. We have seen a very big -- a few big, very big fabless company engaging with TSMC more closely. And we have sales office in the north part, the middle part and southern part of China. So we are participating the China's growth. And we will continue to participate the growth in the future.

Eric Chen - UBS - Analyst

Okay. How about the capacity growth for like 8-inch fab in China?

Lora Ho - TSMC - SVP & CFO

We are aggressively evaluating what's the best way for us to do it.

Eric Chen - UBS - Analyst

Okay. And on your evaluation, what kind of geometry you have put as first priority for your 8-inch fab in China?

Lora Ho - TSMC - SVP & CFO

It's probably too detailed. We are still evaluating. We will let you know when we have a better picture. Okay?

Eric Chen - UBS - Analyst

Okay. Thank you.

Elizabeth Sun - TSMC - Director of Corporate Communications

All right. Next we will ask Credit Suisse, Randy Abrams, for questions.

Randy Abrams - Credit Suisse - Analyst

Okay. Thank you. The first question, I want to ask about the duration of the pullback because second quarter you're seeing the issue from mobile, but inventory exiting near normal levels. And so to what extent do you see a speed-up in second half? And as you go to fourth quarter, how broad is the customer base? Is it a single key product or are you seeing broadening out of 16 FinFET as you ramp that in fourth quarter?



Mark Liu - TSMC - President & Co-CEO

The question -- the second-quarter schedule delay is we see in the mobile product area in several of our customers, so it's not one single customer. But of course there is one single customer impact the most, which is last year to the captive IDMs. As for the second half, we think, first of all, the inventory adjustment will largely complete towards the end of second quarter.

We think the end market of smartphone is still healthy growth this year. Therefore the second half will resume the growth. And, more importantly, our 16 FinFET technology will start to ramp in the second half. So that will contribute a lot of growth, more than the 20-nanometer shipment reduction. So those two factors.

Randy Abrams - Credit Suisse - Analyst

Okay. And the follow-up question, and I'll ask on the 16, if that's multiple customers contributing this year or if it's a single key product. But the second question I wanted to ask about the internalized silicon, one of the impacts was the -- it's well known now that Samsung ramping up with more of its own silicon. If you could talk about how much is that impact versus the broader smartphone weakness in inventory. And as you look forward, do you see that risk staying with you as far as Samsung, Intel internalizing silicon, the ways you can prevent that or mitigate that risk?

Mark Liu - TSMC - President & Co-CEO

Well we definitely see the impact on second quarter, yes. But as far as the future, how that internal captive portion will take away from the foundry, it's really hard to say because each product, they always have some competition considerations. So -- but we are on the -- and also this year the two big smartphone sells very well and that squeezed the Android non-Samsung on non-Apple phones at this point. But that part I think will recover. This is probably a competitive -- competition status in the -- for the period of time only.

So -- but we know that we do not compete with our customers. So the relationship with us and our customer to build the best product to compete is still the best solution seen by many of our customers. And that is we are continuing to work on. And so we will try to produce the best product with our customer to compete.

Elizabeth Sun - TSMC - Director of Corporate Communications

All right. Next one in line actually is Citi's Roland Shu.

Roland Shu - Citigroup - Analyst

Thank you, Elizabeth, Mark, C.C. and Lora. My first question is on given the fast ramp of 16-nanometer, so are we going to see meaningful revenue contribution for 16 in 3Q?

C.C. Wei - TSMC - President & Co-CEO

We ramp up in third quarter this year, but it's many layers of process, plus about one month is back-end. So in 3Q we expect just the revenue just very minimum.

Roland Shu - Citigroup - Analyst

Okay. But we will start reporting 16-nanometer revenue from 3Q?



C.C. Wei - TSMC - President & Co-CEO

Yes.

Roland Shu - Citigroup - Analyst

Okay. Thank you. And with this faster ramp on 16-nanometer, so how do you think about your 16-nanometer overall market share this year? Are we going to see a bigger market share than our major competitor on the 16-nanometer this year?

C.C. Wei - TSMC - President & Co-CEO

I only can say that it's better than we expected.

Roland Shu - Citigroup - Analyst

Okay. Okay. Thank you. And my second question is Intel cut CapEx this year, and also we are talking about -- we are also lower CapEx spending by \$1b by converting more 20-nanometer to 16-nanometer. And I think this is ASML also today, they also say this is a rising trend to convert the N+1 node to N-1 -- N-1 to N+1 going forward. So the question is will this trend continue whether or not this year CapEx spending is peaking out in the near term to TSMC, the overall CapEx spending? Because I didn't -- Mark also said for 7-nanometer we probably are also going to need similar tool as 10-nanometer as well. So with this continue tool conversion, whether or not the CapEx spending is peaking out this year. Thank you.

Lora Ho - TSMC - SVP & CFO

It's probably too early to say that, peaking out, because we are still ramping our 16-nanometer and we're going to spend more money next year in 16. Go above 7 nanometer and we will continue to spend money. So I won't say it's peaking up for now.

Roland Shu - Citigroup - Analyst

Okay. So how about the capital intensity? What's the longer-term view or target for the capital intensity?

Lora Ho - TSMC - SVP & CFO

What I can say now is capital intensity came down from previous year close to 50% to a 40% range. And at least for now I can see we will at the 40% range. But more specific will have to be wait for later time.

Elizabeth Sun - TSMC - Director of Corporate Communications

All right. Also in the order of questions received, I have to go to Morgan Stanley's Bill Lu.

Bill Lu - Morgan Stanley - Analyst

Yes. Hi. Good afternoon. Thanks for taking my question. This is a follow-up to Randy's question. But I'm going to go over some numbers with you first before I ask the question, which is we did the math. I don't think these are exactly right. But over the last five years we've got IDM zero growth, fabless 8%, but system houses above 20%, right. So system houses, I'm excluding memory, just the system LSI, the logic portion. I think that might be slightly conservative.



Now that's a pretty big change. And I'm wondering how you should think about that, how you should -- if you look at TSMC addressing the system houses versus the fabless customers, if you look at, for example, your market share, if you look at your margin for the system houses versus the fabless, how do you think about that? Thank you.

Mark Liu - TSMC - President & Co-CEO

Yes. Indeed, in the past five years the system houses sourcing and foundry business to us has a much higher growth rate, as you quoted. But remember, that came from a very small base. Okay? But we welcome system house sourcing because we consider them are fabless too, fabless companies, the companies without fabs, bring business to us.

It's not necessarily the margin has to do with what type of company sourced. It has to do with our value to that company and also the size, the size of the business. If the business is bigger, of course the -- we probably can enjoy a slightly -- a little bit better price. So it depends on the size of the business, less dependent on what company, system company or non-system company's business.

Bill Lu - Morgan Stanley - Analyst

I guess my question is pretty simple, which is when the fabless is outgrowing the industry, it's easy for me to understand that foundry's going to benefit, right? When the system houses outgrowing the industry, some of them have their own fabs. And so is it a positive or negative?

Mark Liu - TSMC - President & Co-CEO

I'm sorry, system company, someone --?

Bill Lu - Morgan Stanley - Analyst

For example, you had said earlier that one of your customers lost market share to an internal solution. I'd consider that to be a system house as well, right? So overall system house could be in IDM or they might outsource.

Mark Liu - TSMC - President & Co-CEO

Okay. Our system houses are considered fabless system houses, what you just quoted. Mainly it's the fabless system houses. We have very little business from the system houses with their own fabs.

Bill Lu - Morgan Stanley - Analyst

Sure. Okay.

Mark Liu - TSMC - President & Co-CEO

So so long as they're a fabless company, how well the business of that system house depends on their business competition.



Bill Lu - Morgan Stanley - Analyst

Thank you. I guess we'll take it offline. My second question, and I'm not trying to pin you down, but Mark, you said earlier that the inventory correction and by 2Q and second half of the year will be more normal. Now typical normal seasonality, second half is better than the first half. Are we saying that second half of this year's revenue is going to be higher than the first year -- first half?

Mark Liu - TSMC - President & Co-CEO

Okay. Yes. That's what we see. Second half this year will be better than first half.

Bill Lu - Morgan Stanley - Analyst

Great. Thank you.

Elizabeth Sun - TSMC - Director of Corporate Communications

All right. Next one will be from HSBC's Steven Pelayo.

Steven Pelayo - HSBC - Analyst

For the last three years or so, TSMC's been growing 20%, 30% year-on-year revenue growth rates. First quarter 50% year on year. But to Bill's question there, it does look like in the second half of the year, if I play around with your full-year guidance and what you're doing, low single-digit year-on-year growth rates. And if we exclude maybe 16-nanometer, above 16-nanometer, maybe it's flat to down. Is that the new industry? What are we talking now for industry growth rates for both the semi industry and in the foundry market this year?

Mark Liu - TSMC - President & Co-CEO

So your question is the --?

Steven Pelayo - HSBC - Analyst

90 days ago you suggested the semi market was going to grow 5% this year with foundries growing 12%. In light of your new guidance, in light of what it looks like you're going to have very slight year-on-year growth rates in the second half of the year, what do you think that means for the overall industry?

Mark Liu - TSMC - President & Co-CEO

We think the semiconductor growth this year currently is indeed we adjusted down from 5% earlier to 4% at this time. Yes. We think it's really due to the macroeconomic situation around the world today. And therefore the foundry market -- foundry growth rate will adjusted down too. We are looking at about 10% range. So that's why we revised our view on the current semiconductor growth.

Steven Pelayo - HSBC - Analyst

I was just trying to get some specific numbers there. For you, Lora, spending \$1b less on CapEx is going to help with what already is a pretty good free cash flow story this year. Can you talk a little bit about maybe the free cash flow targets for this year and what you'll do with some of that excess



cash? You had \$14b in cash but now it sounds like you have an extra \$1b coming from a lower CapEx budget too. I think you're going to generate free cash flow that's maybe double your dividend payment this year. Can you talk a little bit about free cash flow goals and dividend plans?

Lora Ho - TSMC - SVP & CFO

We are confident with our free cash -- capability to generate free cash flow. If we want to use all the money to pay dividend, which is not a good idea, but certainly we have some capability to do so. Our view on dividend is that we need to sustain the level without going down. And we will try our best to maintain that level. So the cash may go up and then we have several ways to consider. Mark was mentioning we have new target for the five years. We want to grow 10% revenue and EPS. And for that we need to continue to invest, also in capacity and also in R&D. So we need to have some bullet to do that too. Okay? Thank you.

Steven Pelayo - HSBC - Analyst

Can I just quickly add, how much cash do you need on your balance sheet to support a 10% revenue CAGR over the next five years? Is \$14b a year -- \$14b enough?

Lora Ho - TSMC - SVP & CFO

It's difficult to make a quantify. It depends on how much we need to spend to keep that 10% growth. So I would not answer this question for now. Okay?

Elizabeth Sun - TSMC - Director of Corporate Communications

All right. I think it's about time for us to actually go to the line. So we will now take our next question from the call. Operator, please proceed with the first caller on the line.

Operator

Mehdi Hosseini, SIG.

Mehdi Hosseini - SIG - Analyst

Thanks for letting me ask a question. Two follow-ups. You talked about converting 20 to 16-nanometer. Can you elaborate on the magnitude of this conversion? And I have a follow-up.

Lora Ho - TSMC - SVP & CFO

Without going too specific, what I can say is early of this year we expect to have more 20 than 16 capacity. Now with the conversion more aggressively, we now see 16-nanometer capacity will be bigger than 20-nanometer for this year.

Mehdi Hosseini - SIG - Analyst

Sure. As this conversion actually takes place, would that impact the installed base of the equipment and therefore would that help you with a one-time positive impact to gross margin?

Lora Ho - TSMC - SVP & CFO

It -- I don't think it would help our one-time improvement in gross margin. As I said earlier, the two technology nodes share the same facilities. So the depreciation has to go to the two nodes for a period of time. Okay?

Mehdi Hosseini - SIG - Analyst

Okay. And then just one quick follow-up on the CapEx cut. What -- can you help me better understand what has happened over the past few months that has given you the confidence that you can reuse the equipment? I imagine the reuse is something that has happened very often in the past. What happened in the past couple of months that made you decide to cut the CapEx?

Lora Ho - TSMC - SVP & CFO

There were two things that made us do this decision. Number one is we did improve our capital efficiency, meaning we are reducing our CapEx per K investment. That's pure savings. Another thing is the conversion faster from 20 to 16 as we see customer migrate to 16 faster than we thought. So there will be some excess capacity for 20-nanometer going forward if we don't do it.

It's not a magic, and at the very beginning we know these two nodes has very, very high commonality in equipment. The commonality is about 95%. So it's just a matter of timing, what's the timing to do this transition. And we decided to do it now.

Mehdi Hosseini - SIG - Analyst

Great. Thanks so much.

Elizabeth Sun - TSMC - Director of Corporate Communications

All right. We will continue on the line. Operator, please have the next caller on the line.

Operator

Brett Simpson, Arete Research.

Brett Simpson - Arete Research - Analyst

Yes. Thanks very much. My question on 10-nanometer, I know it's still 18 months away from ramp-up, but can you talk about how fast this ramp might scale relative to 20-nanometer or 28-nanometer?

And as you ramp up 10-nanometer for high-end smartphones, would you expect low-end smartphones to start migration from 28 with 16 FinFET in 2017? Thank you.

Elizabeth Sun - TSMC - Director of Corporate Communications

All right. So, Brett, we just want to make sure we hear you correctly. Your question seems to say that if we ramp 10-nanometer in the future, which will be targeting the high-end smartphone, will the low-end smartphone be migrating from 28-nanometer into 16-nanometers. Is that your question?



Brett Simpson - Arete Research - Analyst

Yes. And just to add to that, Elizabeth, how quickly will 10-nanometer scale up relative to the scaling of 20-nanometer -- the ramp-up of 20-nanometer and 28? Will it be as fast?

Elizabeth Sun - TSMC - Director of Corporate Communications

Okay. All right. So the profile of the 10-nanometer ramp, will that be steeper than the profile of the 20 or the 28-nanometer?

Brett Simpson - Arete Research - Analyst

Yes.

Elizabeth Sun - TSMC - Director of Corporate Communications

Yes. Thank you.

Mark Liu - TSMC - President & Co-CEO

Okay. The first part of the question has to do with 10-nanometer ramp for the high-end smartphone, will the mid/low-end move to 16? I think we -- this is up to our customers' product portfolio. We definitely know a lot of customer is looking at 28-nanometer to use -- to do as the low end. But the specification, the smartphone processor specification changes constantly. So what portion of that product will move to 16-nanometer? We think definitely there are some portion, but how a big portion really depends on their product strategy.

On the 10-nanometer ramp, I wouldn't say it's bigger. But at least it's similar scale of our ramp as we do in 16 and as we do in 20.

Brett Simpson - Arete Research - Analyst

Great. Thank you. And let me just have a follow-up here. There's been a lot of talk in the industry about one of your larger customers planning to introduce a new application processor on both Samsung's 14-nanometer process as well as your 16 FinFET for the same chip later this year. And we haven't really seen a single chip get taped out on two new processors at the same time before in the industry.

So my question, how does this really work between the two foundries? Does it mean that that one customer can adjust dynamically, month to month, how they allocate wafers between you and Samsung? Or am I -- or how might this work? Thank you.

Elizabeth Sun - TSMC - Director of Corporate Communications

Brett, I think I tried to understand your question while the photographer's camera is very noisy here. Okay. So your question seems to say that there is a customer that appeared to be working with two different foundries on the 14 and 16-nanometer node. And the products are about to arrive. You would like to understand how this customer will be allocating month by month the -- what's the production or the orders with both of the two foundries. Is that your question?

Brett Simpson - Arete Research - Analyst

Yes, that's right. Whether they can move around dynamically how they allocate wafers. That's right.



C.C. Wei - TSMC - President & Co-CEO

Well my answer is very typical. Our 16 FinFET is really very competitive. And we did not know that customer going to -- how they're going to allocate. I cannot even make any comment on that.

Elizabeth Sun - TSMC - Director of Corporate Communications

So, Brett, did you hear the answer?

Brett Simpson - Arete Research - Analyst

Yes.

Elizabeth Sun - TSMC - Director of Corporate Communications

Okay.

Brett Simpson - Arete Research - Analyst

Maybe instead if I can perhaps just ask, you previously said 16 FinFET will be high percent of -- high single-digit percent of sales in Q4. What's the latest update on that?

Elizabeth Sun - TSMC - Director of Corporate Communications

All right. I think that question has already been asked earlier, that I think it was Andrew, right? Yes. He -- Andrew suggested that whether it will be 12%, right?

Brett Simpson - Arete Research - Analyst

Thank you.

Elizabeth Sun - TSMC - Director of Corporate Communications

Okay. Now we come back to the floor. Next the questions will be coming from Goldman Sachs, Donald Lu.

Donald Lu - Goldman Sachs - Analyst

(Spoken in foreign language). My first question is about InFO. Just to confirm you said by Q3 next year the quarterly revenue from InFO will be \$100m? And also -- Q4, sorry. What would be the gross margin for this business and also how many customers you have? So that's question number one.

The question number two is I think Mark talked about 10-nanometer and 7-nanometer. Will TSMC offer 8-nanometer similar to 20-nanometer? Thank you.



C.C. Wei - TSMC - President & Co-CEO

Well on InFO, you asked about what is the margin. The margin is line with the TSMC's back-end business. That I can say. I'm pretty sure for that.

And how many customers, that I cannot tell you. Many.

Donald Lu - Goldman Sachs - Analyst

So you will have more than one customer next year?

C.C. Wei - TSMC - President & Co-CEO

Yes.

Donald Lu - Goldman Sachs - Analyst

Thank you.

Mark Liu - TSMC - President & Co-CEO

To answer your question, we will not offer 8-nanometer.

Elizabeth Sun - TSMC - Director of Corporate Communications

Okay. Next we'll go to JPMorgan's Gokul.

Gokul Hariharan - JPMorgan - Analyst

Thanks for taking my question. First of all on 16-nanometer, since Dr. Wei mentioned that next year a lot of demand on entry-level to mid-end smartphone is still going to stay at 28-nanometer, could you talk about your visibility for second-wave demand for 16-nanometer?

And a related question would be would your combined 20/16-nanometer capacity plan, as it stands right now, how much below 28-nanometer would it be or it would be at the same level of whatever you built for 28-nanometer in the last five years? Thanks.

C.C. Wei - TSMC - President & Co-CEO

So you talk about the second wave for 16 FinFET?

Gokul Hariharan - JPMorgan - Analyst

Yes. What is the visibility that you have? Is it going to be really strong? Because you mentioned that a lot of the cost-sensitive customers would still stay on 28, at least for next year.



C.C. Wei - TSMC - President & Co-CEO

Okay. For 28-nanometer I said mid to low end this year that, and next year probably, that smartphone will stay in 28-nanometer because it's very cost-effective and performance-wise is very good. For 16 FinFET I think that people will start to move with their product plan and some of the mid-end smartphone will move into 16-nanometer. That's for sure.

In addition to that, we also see improving our 16 FinFET ultra-lower-power Mark just mentioned. And that will have a lot of application. And every product, lower power consumption is one of that advantage. And so that would be our second wave of 16 FinFET.

Gokul Hariharan - JPMorgan - Analyst

Okay. Just wanted to add on to that, so when you think about capacity planning for 20 combined with 16 or 16 right now, given that you've accelerated conversion, would you be building similar level of capacity as 28 that you built over the last three, four years?

C.C. Wei - TSMC - President & Co-CEO

Well that is too early to say right now. But we expect 16 FinFET is a long-lasting node and very similar to 28-nanometer.

Gokul Hariharan - JPMorgan - Analyst

Okay. Thank you.

Elizabeth Sun - TSMC - Director of Corporate Communications

All right. Dan Heyler has a follow-up question. Dan.

Dan Heyler - BofA Merrill Lynch - Analyst

Thank you, Elizabeth. So on 16, this FinFET compact which is getting introduced, when would we expect to see that in volume production?

C.C. Wei - TSMC - President & Co-CEO

16 FinFET?

Dan Heyler - BofA Merrill Lynch - Analyst

Compact FFC?

Elizabeth Sun - TSMC - Director of Corporate Communications

FFC.

C.C. Wei - TSMC - President & Co-CEO

FFC? That will be ready next year. And we expect that high-volume production starts probably two years later. That's year 2017. 2018 will reach the high volume.



Dan Heyler - *BofA Merrill Lynch - Analyst*

Okay. So is there a -- so the cost-down version for mid-end phones FinFET that you alluded to, plus low power, when is that available?

C.C. Wei - *TSMC - President & Co-CEO*

Probably in 2017 second half.

Dan Heyler - *BofA Merrill Lynch - Analyst*

Okay. Great. And then on just number of customers that are in volume production in the third quarter and fourth quarter of 16 FinFET, just the number of customers that are in volume production.

C.C. Wei - *TSMC - President & Co-CEO*

You ask a very specific question now. We have a few customers in the volume production, but not as -- I cannot tell you it's 10, 20 or -- I cannot say. No.

Dan Heyler - *BofA Merrill Lynch - Analyst*

A few meaning three?

C.C. Wei - *TSMC - President & Co-CEO*

Too specific.

Dan Heyler - *BofA Merrill Lynch - Analyst*

Thank you very much.

Elizabeth Sun - *TSMC - Director of Corporate Communications*

All right. Michael. Yes.

Michael Chou - *Deutsche Bank - Analyst*

A follow-up question for InFO. As your customer may be concerned about concentration rate for your InFO, is that possible for you to consider outsourcing to -- licensing to OSAT vendor or you will try to do InFO in the long term since you are developing 10-nanometer InFO?

C.C. Wei - *TSMC - President & Co-CEO*

Whether we are going to license this technology out to OSAT, it will all depend on the business. At the beginning, when we ramp it up, of course it will be 100% inside TSMC. After that we will work with customer, see whether the business need or not and whether we work with the OSAT. There is a lot of flexibility and possibilities.

Elizabeth Sun - TSMC - Director of Corporate Communications

Well it seems that we have answered everybody's question successfully today. And then that way we will end our conference here. Thank you for coming.

Before we conclude, we will -- the replay of this conference will be accessible within three hours from now, transcript will become available 24 hours from now, both of which will be available through TSMC's website at www.tsmc.com.

So thank you for joining us today. We hope we will -- you will join us again next quarter. Goodbye.

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