S1 2018 Earnings Call

Company Participants

- Peter Wennink, President and Chief Executive Officer
- Roger Dassen, Executive Vice President and Chief Financial Officer
- Skip Miller, Vice President, Investor Relations Worldwide

Other Participants

- Adithya Metuku, Analyst
- Amit Harchandani, Analyst
- Andrew Gardiner, Analyst
- C.J. Muse, Analyst
- David Mulholland, Analyst
- Douglas Smith, Analyst
- Edwin Mok, Analyst
- John Pitzer, Analyst
- Krish Sankar, Analyst
- Mehdi Hosseini, Analyst
- Mitch Steves, Analyst
- Robert Sanders, Analyst
- Sandeep Deshpande, Analyst
- Stephane Houri, Analyst
- Tammy Qiu, A

Presentation

Operator

Good afternoon, ladies and gentlemen. Thank you for standing by. Welcome to the ASML 2018 Second Quarter Financial Results Conference Call on July 18, 2018. Throughout today's introduction, all participants will be in a listen-only mode. After ASML's introduction, there will be an opportunity to ask questions. I would now like to open the question-and-answer queue. (Operator Instructions).

I would now like to turn the conference over to Mr. Skip Miller. Please go ahead, sir.

Skip Miller {BIO 20244900 <GO>}

Thank you, Patricia. Good afternoon, and good morning, ladies and gentlemen. This is Skip Miller, Vice President of Investor Relations at ASML. Joining me today from ASML

headquarters in Veldhoven, the Netherlands is ASML's CFO, Peter Wennink, and we would like to welcome our new CFO, Roger Dassen. The subject of today's call is ASML's 2018 second quarter results. Length of this call will be 60 minutes and questions will be taken in the order that they were received.

This call is also being broadcast live over the Internet at asml.com. A transcript of management's opening remarks and a replay of the call will be available on our website shortly following the conclusion of this call.

Before we begin, I'd like to caution listeners that comments made by management during the conference call will include forward-looking statements within the meaning of the federal securities laws. These forward-looking statements involve material risks and uncertainties. For a discussion of risk factors, I encourage you to review the Safe Harbor statement contained in today's press release and presentations found on our Web site at asml.com and in the ASML's annual report on Form 20-F and other documents as filed with the Securities and Exchange Commission.

With that, I would like to turn the call over to Peter Wennink for a brief introduction.

Peter Wennink {BIO 1852674 <GO>}

Thank you, Skip. Good morning, and good afternoon, ladies and gentlemen, and thank you for joining us for our Q2 2018 results conference call. Before we begin the Q&A session, Roger and I would like to provide an overview and some commentary on the second quarter, as well as provide our view of the coming quarters. Roger will start with a review of our Q2 financial performance with added comments on our short-term outlook and I will complete the introduction with some additional comments on the current business environment and our future business outlook. Roger, if you want?

Roger Dassen {BIO 15064806 <GO>}

Thank you, Peter, and welcome, everyone. As Peter mentioned, I will first highlight some of the second quarter accomplishments and then provide our guidance for the third quarter of 2018. Q2 net sales came in at EUR2.74 billion, somewhat higher than we guided driven by strong demand across our full product portfolio. Net system sales of EUR2.09 billion was nicely balanced between memory at 54% and logic at 46%.

EUV revenue of EUR667 million was a combination of revenue from four shipments, one more than previously guided and deferred revenue from previous quarters. And as you know, we are now recognizing the majority of revenue for an EUV system at the time of shipments. Installed base management sales for the quarter came in at EUR654 million. Overall gross margin for the quarter came in at 43.3%, which was just above our guidance reflecting the strength of our DUV and Holistic Lithography business as well as progress in EUV profitability. Overall CapEx -- OpEx that came in slightly above guidance with R&D expenses at EUR380 million and SG&A expenses at EUR117 million.

Turning to the balance sheet. After paying a total amount of EUR866 million on dividends and share buybacks, we ended last quarter with cash and cash equivalents and short-term investments at a level of EUR2.98 billion.

Moving to the order book. Q2 system bookings came in at EUR1.95 billion, 45% of the order intake was from logic customers, memory made up to the remaining 55% of order volume. The bookings are mainly driven by the strong EUV business. We took one view EUV orders in this quarter. In Q2, six EUR269 million worth of shares were repurchased, this leaves around EUR2 billion of the 2018/2019 share buyback remaining. Additionally, we paid a dividend of EUR1.40 per share valued at EUR597 million. With that, I would like to turn to our expectations and guidance for the third quarter of 2018.

We expect Q3 total net sales to be similar to Q2 [ph] between EUR2.7 billion and EUR2.8 billion. Our total net sales forecast includes around EUR500 million of EUV system revenue from five EUV system which we target to ship in the quarter. Our EUV shipment plan is still 20 systems for 2018. We expect EUV order flow to continue in the second half of the year in support of our 2019 shipment plan of at least 30 systems. We expect our Q3 Installed Base Management revenues to step up a bit from previous quarters to around EUR700 million.

The service portion of this business is pretty stable, whereas the upgrade revenue is more dependent on system utilization. In current business environment, when systems are running at high utilization, customers are less willing to take systems down for upgrades.

Gross margin for Q3 is expected to be between 47% and 48%, reflecting the growth and profitability across all products. The higher R&D expense for Q3 of about EUR395 million are due to an acceleration of the NXE:3400 roadmap and the High-NA EUV program. SG&A is expected to come in at about EUR120 million. We remain excited about the balance of 2018. Customers demand for our products continues to be strong. We look forward to a year of continued strong growth in both revenue and profitability.

With that, Peter over to you.

Peter Wennink {BIO 1852674 <GO>}

Thank you, Roger. As Roger has highlighted, we had a good first half of the year and our business continues to perform very well. The positive industry environment and increasing litho intensity continues to drive strong demand in both logic and memory markets, as customers migrate to more advanced nodes requiring our full suite of products. For the second half of the year, we see strength in DPV driven by memory and EUV driven by logic. After an excellent first half, in 2018, we expect the second half to be stronger with improved sales and profitability and as well as continued growth from Q3 to Q4.

Logic demand continues to be solid as both existing and new market applications require more high-performance compute power. Customers are preparing the ramp of the 7-nanometer node which is driving a significant increase in EUV demand. Given the progress made in the EUV execution, there's now increased customer confidence in the

future of logic roadmap and furthermore plans are being put in place to secure the next generation high in EUV. Progress in high-performance compute require seamless advances in the memory roadmap execution for both volatile and non-volatile memory.

Memory strength in both DRAM and NAND is driven by increasing content per device as well as expanding end-market applications. And in DRAMs to meet the current bit growth demand expectations of 20% to 25%, we see customers continuing with technology migrations and wafer capacity additions. As fewer bits are being supplied via technology node migrations, it drives an increased need for wafer capacity additions. In NAND, with planed 2D to 3D NAND conversions nearly finished, customers require new Greenfield fab capacity. This along with vertical scaling via specs of stacks drives additional lithography demand.

Significant investments in Greenfield fabs although dampened by high NAND growth rates which are expected to stay in the 40% to 45% range may create some short-term volatility. In memory overall, we don't see any structural supply imbalance concerns that would significantly change our positive view of this market segment.

On the ASML product side, let me start with an update of our EUV business. In EUV, we continue to make progress as this technology ramps in production. Priority continues to be on productivity or wafers per day, which is a combination of system throughput and availability. On the availability, we have made significant improvements that have enabled four week availability above 85% on a number of systems with the latest configuration our NXE:3400. On throughput, we have customer systems running at 125 wafers per hour and we have demonstrated performance beyond 140 wafers per hour.

Focused execution of our EUV program is enabling an acceleration of our roadmap in terms of throughput, availability and overlay, creating the opportunity for value creation for both our customers and ASML. With this in mind, we decided to accelerate some of the R&D spending to pull-in these benefits and we are working to finalize the configuration and specifications of this accelerated roadmap, and will provide an update later this year, and these improvements will provide an even stronger foundation for our EUV business going forward.

In DPV, we are now shipping to NXT:2000 system, which delivers increased customer value via improved lithography performance. We're planning an aggressive ramp of these systems in the second half of the year driven by strong customer demand in both memory and logic. In holistic lithography, we continue to see growth across our full portfolio of software and metrology products enabled by the continued integration of HMI's e-beam technology and ASML's computational and controlled products.

To summarize 2018, we expect continued solid growth in sales and profitability versus 2017. And that's an excellent first half, we expect revenue in the second half to be stronger with an improved profitability and we further more expect the growth to continue from Q3 to Q4 as mentioned earlier. Regarding 2019, it's a bit too early to provide quantitative guidance, but I will provide some comments regarding our initial view on high-level trends going into the start of next year.

In memory we see strong DPV demand continuing with an initial EUV opportunity at more advanced nodes. In logic, 7-nanometer node will continue to ramp driving a further increase in EUV demand on top of a solid demand in DPV. In our Installed Base Management segment, we expect continued growth via our service revenue from a growing installed base as well as upgrade business opportunity. Although the latter is somewhat dependent on the customers' willingness to sacrifice utilization in the periods during upgrade.

In summary, at present, we currently expect the strong growth as we experienced this year to continue into 2019. We're well track to achieve our 2020 targets with significant growth potential beyond 2020. And we plan to communicate our growth opportunity through 2025 at our Investor Day on November 8th this year.

And with that, we would be happy to take your questions.

Skip Miller {BIO 20244900 <GO>}

Ladies and gentlemen, the operator will instruct you momentarily on the protocol for the Q&A session. Beforehand, I would like to ask that you kindly limit yourself to one question with one short follow-up if necessary. This will allow us to get as many callers as possible.

Now, operator, can we have your final instructions and then the first question, please?

Questions And Answers

Operator

Thank you, sir. Ladies and gentlemen at this time, we will begin the question-and-answer session. (Operator Instructions) The first question is from Mr. Sandeep Deshpande. Please state your company name.

Q - Sandeep Deshpande {BIO 3869012 <GO>}

Thank you for letting me in. This is Sandeep Deshpande from JP Morgan. Peter, I have two quick questions. I mean firstly on your gross margin guidance for the third quarter. I mean you clearly are guiding to a much stronger gross margin than the market expected. Can you give us the dynamics, is this EUV related that EUV gross margins are beginning to ramp up and which is why your gross margin improving so quickly from the second quarter when you had a large number of EUV shipments or is there some other mechanism which is causing gross margin to improve.

And secondly, the market has been worried about issues in the memory supply CapEx environment, and you have said in your introductory remarks as well that you are not seeing any of this. Can you confirm at this point that you have not seen any DRAM related push-outs or anything of that sort at this point and that your customers remain confident on their existing roadmaps in terms of capacity additions that you mentioned on the wafers as well into 2019. Thank you.

A - Peter Wennink {BIO 1852674 <GO>}

Okay, thank you. Sandeep, I will answer the second question and Roger will go into the gross margin question on Q3. On the memory markets, as you said, our customers which is multiple and we've always seen that in the roadmap execution customers from time-to-time have some push-outs and some pull-ins and that's what we are seeing. We are seeing one customer pushing out that few tools and all the customers pulling-in. So as a memory segment, and especially DRAM and you referred to DRAM, we haven't seen any change. So it was some push-outs and pull-ins, that's actually quite normal. Roger, do want to take the first one question?

A - Roger Dassen {BIO 15064806 <GO>}

Sure. On gross margin, Sandeep, it's a combination actually of three things. So as we see, there is a 4 percentage point increase in gross margin, about half of that is a result of the mix within DUV. So the mix in DUV is such that we see a 10% -- a 2% uplifts of gross margin as a result of that. The remaining 2% uplift is in EUV and that is a combination of two things. So first off, as you've heard, we plan to recognize five system sales in this -- in Q3 rather than seven so that is an uplift. And secondly, we also are looking at an improvement of the EUV margin overall. So mix of DUV, improvement of EUV margin and two less system of EUV.

Q - Sandeep Deshpande {BIO 3869012 <GO>}

Thank you.

Operator

Following question is from Mr. C.J. Muse. Please state your company name and ask your question.

Q - C.J. Muse

Yeah. Good morning, good afternoon. Thank you for taking my question. I guess first question, I think you talked about accelerating your EUV roadmap, and I'm curious I guess short-term and long-term question is as part of that. What impact is that having on your ability to close orders for EUV shipments into '19. And then I think, I guess medium term looking 2020, what does this higher throughput mean in terms of your thought process in terms of what capacity and/or growth in shipments in EUV will require? And then I got a quick follow up.

A - Peter Wennink {BIO 1852674 <GO>}

Yeah, I think, the acceleration of the roadmap is clearly driven by the fact that we see an opportunity to improve the productivity and as I said, that's a function of availability and the wafer per hour capability of the tool. And that is the result of the execution results that we've seen over last six months. So having said that, we would like to pull-in that value which is a clear value for the customer, because and that basically means that customers are of course wanting that value sooner than later, but this is an R&D program that we're just starting in Q3. So it takes time for that productivity increase to become available in 2019. Until that moment in time, customers have the availability for a machine which is the

3400B that doesn't have 25 wafers per hour and provides food value for the price that they're paying.

So for the customers, there's a very good alternative to keep going on EUV, because there is a very capable tool out there with the expectation and with the promise of an even more valuable tool in the course of 2019. So it is what it is. The tools will be available when they are available. Customer needs to ramp the 7-nanometer logic and they will do so. But in answer to your second question, clearly, if we keep increasing the productivity of that tool, it means that the cost per layer will be more and more in favor of EUV. You will see layer adoption going forward beyond 2019, of course potentially being more in favor of EUV than it was before, because higher productivity means a lower cost.

Now from a capacity point of view -- from our point of view, it means that with the improved performance of that machine, we can provide our customers with more wafers. So we don't need to do that by actually selling more tools at 125 wafers per hour, but can sell the same number of tools that were currently planing with a higher throughput, so that will help our customers. And we don't see at this moment yet a need for a very fast increase of our current capacity at -- and at ASML. I think what we will see, first give our customers more wafers on EUV at a lower cost per wafer. I well answered that, I hope that it will help you C.J.

Q - C.J. Muse

Yeah, very helpful. And then I guess as a quick follow-up. As you talked about early indications pointing to another strong year in '19. And if I look at your DUV order book, excluding EUV, it looks like that business accelerated 30% Q-on-Q. So I guess, how far is your visibility expecting and should order momentum within DUV continue into the coming few quarters? Thank you.

A - Peter Wennink {BIO 1852674 <GO>}

Given our longer lead time as compared to some other players in the industry and the visibility that we're getting from our customers goes into 2019. It's generally 9 to 12 months where we're going to be pretty detailed on what they need and what we can provide, because we have a supply chain also. So when we say we it as -- as the DPP strength both memory and logic moving into 2019 that's based on the interaction that we have with our customers on this 9 to 12 months horizon.

Q - C.J. Muse

That was helpful. Thank you.

Operator

Our next question is from Mr. Krish Sankar. Please state your company name and ask your question.

Q - Krish Sankar {BIO 16151788 <GO>}

Yeah, hi. Thank you for taking my question. It's from Cowen & Co. I had two questions on gross margin. One on the near-term, you guys mentioned revenue should grow from Q3 to Q4, how should we think about gross margin in Q4 relative to Q3? And then on the longer term, it looks like your EUV gross margins in the mid-teens, what levels do they have besides volume to drive it to a 40% gross margin per EUV based your 2020 model? Thank you.

A - Peter Wennink {BIO 1852674 <GO>}

Well, we gave you gross margin guidance on the Q3 and we gave you that clearly. So we won't give it on Q4, but we gave you an overall comment in the prepared remarks that we believe that both our sales and profitability will go up. So I'm not going to give you any details of the gross margin, but clearly we see -- we see an improvement on both accounts, sales and profitability. And the first evidence which we you gave you for the Q3 gross margin guidance. On the gross margin on EUV of 2020. I think there were four ingredients. Let's call it this way, how to get to the 40% gross margin. And we've always said is, that is the volume. Well the volume, we haven't changed really. I mean volume is -- we set at 20 this year, 30 in 2019 growing to potentially 40 in 2020. You can look that up into our -- into the scenarios that we gave you, that hasn't changed.

But the volume is very important for gross margin increased, because it gives us a better coverage of our fixed cost. The fixed cost for our total capacity to 40 to 45 systems is already there. So that will be a big help. What two is two is mix, mix reception or the gross margin we said before, was based on our views that, we would in 2020 ship a combination of 125 wafer per hour tool and potentially higher wafer per hour tool. Now, we've put that in. So if anything, the second -- a pillar of the gross margin increase has now has been pulled in and is positively changed in the sense that by 2020, we will have only the higher productivity tool instead of a mix of the lower and a higher productivity tool. So that helps.

Number three is cost reductions. The cost reductions is a targeted program, is a targeted plan and we are on track, that means, higher volume will drive their cost per module down and we will benefit. Fourth is service. Now, we've mentioned that before. Service, currently we're still in a warranty period, so we cannot collect a real good sales income from a wafer -- sorry from a sales per wafer system that we're going to apply going forward, but tools that are out of warranty by 2020 will of course create a service income that we currently do not have and will give us coverage service cost infrastructure.

Now there is an upside there. It might be in 2020, might be a bit too early, but later on we are selling higher productivity tools. High productivity tools will give more wafers per hour and will give more wafers per day, and will give us a potential upside of our service income beyond 2020. Now, so if you look at it and you look at those four ingredients, then I think we have a -- its a good level of or high level of confidence I would say to meet our 40% gross margin target by 2020.

Q - Krish Sankar {BIO 16151788 <GO>}

Thanks, Peter. Very helpful, thank you.

Operator

Following question is from Mr. Andrew Gardiner. Please state your company name and ask your question.

Q - Andrew Gardiner {BIO 7137663 <GO>}

Hi, good afternoon, gentlemen. It's Andrew Gardiner from Barclays. Peter, I was interested in some of the comments you were making in terms of EUV tools shipments or capacity. And you guys have talked specifically about 2019 and the sort of the 30 unit level. In prior quarters, in the last couple of quarters, you've talked about how that was a challenging target in particular sort of through the supply chain and the lead times you're dealing with in terms of the different components, different modules. So perhaps reading between the lines here. But you sounded a little more confident in some of your comments on that 32 units or at least 32 unit for next year. Is that the case in, and is it indeed the case that you all -- you're sort working through some of those capacity constraints and so there could be more likely to be upside to the 30 unit mark for next year? Thank you.

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think currently we stick to the 30 unit mark, but yes, of course, we are up in a learning curve and that also is true for our supply chain. So I think from a supply point of view, we are more confident about the 30 units. But I think it's too early to have promise anyone including our customers anything more than that. Now of course, we will try to get every one or two units extra out of it, but our plan currently stays at that 30 units and that 30 units is going to be a mix between or what we call B system in our C system. Like I explained earlier, whereby the C system will be introduced in the course of 2019.

Q - Andrew Gardiner {BIO 7137663 <GO>}

Okay, thank you. And then just a quick follow-up. In terms of the EUV revenue recognition this year, you previously said 2.1 billion, is that still the case or given you did a little better in the current towards the second quarter and you're expecting a reasonable amount in the third quarter is likely to be a bit higher than that now?

A - Roger Dassen {BIO 15064806 <GO>}

Andrew, I think we're still -- we're still aiming for the 2.1 in this year.

Q - Andrew Gardiner {BIO 7137663 <GO>}

Okay, great. Thank you very much.

Operator

Following question is from Mr. Edwin Mok. Please state your company name and ask your question. Hello Mr. Mok, please unmute your line.

Q - Edwin Mok {BIO 15222334 <GO>}

Hi, sorry about it. Thanks for taking my question. So my first question on kind of your outlook for 2019. Just curious how much of that growth or the strength you expect on industry comes from indigenous Chinese customer versus call it more the multinational in China?

A - Peter Wennink {BIO 1852674 <GO>}

Yes. I think what we're seeing in China. Yes, you have to make a -- you may have to make a separation between let's say, the local Chinese customers and the multinational's having their operations in China. There are some activities on the latter, so the multinational's into China. For instance, there is a investment ongoing in Wuxi, which is from a Korean memory maker. So that will happen next year. There are some others from other -- some multinational customers, especially in the memory space. There is something happening in the logic space. So that's still going pretty strong, but the local Chinese customers will use 2019 to further ramp their first lines.

We see shipments through the first lines of the local Chinese customers happening this year. And depending on the success of their products and the qualification of their products for the use in the local Chinese customer market, that will drive the level of tools that they need to further ramp their first and their second line. And that is really dependent on the success with which they can execute on the qualification of their products, be it memory or be it logic products for their customers. And that's something that we have not full insight in, but that is a potential upside if they do this very well. But I believe the Chinese market will be strong for both local and for international customers.

Q - Edwin Mok {BIO 15222334 <GO>}

Great, that's very helpful color. And just my quick follow-up, can you remind us what's the timing of the high-NA and maybe give some color on that.

A - Peter Wennink {BIO 1852674 <GO>}

Yes. The first high-NA is scheduled late 2021 and we'll ship through 2022 to 2023 the first R&D systems that what we called early volume systems. And that in total, it's about 12 systems. So 2021, late 2021 starting to 2022/2023 about 12 systems and then in 2024 onwards, we will see the high volume introduction. Is that clear? Operator, next question.

Operator

Our following question is from Mr. David Mulholland. Please give your company name and ask your question.

Q - David Mulholland {BIO 16819172 <GO>}

Hi, and thanks very much. Just coming back on the -- it's David Mulholland from UBS. Just coming back on the roadmap acceleration comments you made. I know you said, you're still finalizing the specification, but if I recall from the road map you've presented before, you said the next stage was 155 wafers per hour. Is that essentially what you're pulling in or do you think you can do a little bit better than that, and can you help us understand

what this means for ASPs? I know you've said, it will deliver value to yourself and customers, but can you help us quantify that?

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think what we presented last week at SEMICON West, we gave you a teaser, in the sense we said, well, there's a roadmap beyond 155 wafers per hour, that 155 is the first target. Now how much that will be in the details of it, I think we'll be very happy to go into detail with you and your colleagues on November 8. We'll do an extensive review of the roadmap and how we see that develop in the couple of years -- in the next couple of years. And yes, that will have an impact on the ASPs, because we will provide higher throughput which will drive of course the cost per wafer down which will also have lead to a review by our customers of the layers that they want to allocate to EUV for as the DVP, and that will lead to higher ASPs. What we've normally done, we've always said to the customer, listen we are going to share that upside value. And the trends that you've seen of increasing ASPs on DPV where ASPs rose generally with the productivity, that is also what you would see in EUV.

Q - David Mulholland {BIO 16819172 <GO>}

And then just a quick follow-up on the confidence you have on the kind of DRAM adoption, obviously, probably the most sensitive to the productivity of the tool. So given the progress you've been making, can you maybe just comment on your confidence on seeing DRAM adoption in the next year or two of EUV?

A - Peter Wennink {BIO 1852674 <GO>}

Well, I think you know clearly, higher productivity, better availability leads to significant lower wafer costs which is more sensitive in the memory space and in the logic space. So yes, I mean, it is our expectation that when we execute our roadmap, that the advantages of applying that lower cost per wafer to DRAM market are also obvious. So one of our drives of course is to make sure that we can have the consistency of that productivity also extended into the markets for DRAM. And it may not be a surprise, that of course, the key focus of our key DRAM customer is on the productivity and on this 1300C roadmap. So yes, that will have a positive effect.

Q - David Mulholland {BIO 16819172 <GO>}

That was great. Thank you.

Operator

Our next question is from Stephane Houri. Go ahead please. State your company name and ask your question.

Q - Stephane Houri {BIO 3899118 <GO>}

Yes, good afternoon. This is Stephane Houri from Oddo BHF. So I have a question about R&D. We see R&D budgets going up, do you have a view or could you help us understanding how this budget is going to evolve during the coming years. I understand

this is to accelerate the EUV roadmap, but could you give us some clarity on the numbers. Thank you.

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think when you think about R&D and the R&D increase that we're going to be seeing has two reasons -- two key reasons. One is the pulling off the high-NA EUV tool, which we explained versus last quarter, and this quarter, we see the acceleration of the 0.33NA roadmap. That of course is there to support the ramp up of the higher productivity tool, that will of course tail off at a certain moment in time. I think it will still extend into 2019. Like said -- as I answered previous question. At our Capital Markets Day in November, we will give you more details on the productivity roadmap and I will not stop at the 155 wafers. So some of that R&D that is needed there will continue in 2019.

But going forward, I think the R&D in itself cannot be seen as a separate item. We also have to look at what we see as an upside opportunity in terms of sales with the progress we've with EUV, the fact that EUV can be used on more layers. I think it is good to realize that our sales numbers beyond 2020 will also grow and that means that to support that growth, and we'll give you more details in the fourth quarter. We'll also will adjust our R&D spend to it.

Now clearly, that is going to be well explained in detail, I explained. So its too early to give you a quantitative guidance on the R&D number going forward, because it's very much tied to the upside opportunity and the sales opportunity that we are seeing which we believe is beyond 2020 significant.

Q - Stephane Houri {BIO 3899118 <GO>}

Okay. And I have a quick follow-up if I may. Did you see in your recent discussions with your customer any distortion regarding the potential trade war between the US and China, did it have any impact on your discussion? Thank you.

A - Peter Wennink {BIO 1852674 <GO>}

I can be short on that, no. I mean, we had -- not had any negative feedback or feedback that has an impact on our business from our customers due to this dispute, that's not the case.

Q - Stephane Houri {BIO 3899118 <GO>}

Okay, thank you very much. Very clear.

Operator

Our following question is from Mr. John Pitzer. Please go ahead. State your company name and ask your question.

Q - John Pitzer {BIO 1541792 <GO>}

Yeah, it's Credit Suisse. Peter, thanks for letting me ask the questions and congratulations on the good results and outlook. Peter, I'm wondering if you could elaborate a little bit around your comments around the expected uptick and upgrade revenues in the calendar third quarter that you talked about in your opening commentary. As you pointed out, customers only really willing to do that when they're willing to take utilization hit. So it's little bit surprising given the Q3 is supposed to be the seasonally strong period that customer would (Technical Difficulty) upgrade in that quarter. Is that sort of specific to a device types of certain customer or you would all worry that utilizations for your customers -- when your customers are willing to take utilization hit in the calendar third quarter.

A - Peter Wennink {BIO 1852674 <GO>}

Well, I think our total installed base management business for the second half and I think year-on-year does see an effect of the fact that our customers don't want to put the tool down to do an upgrade. I think that makes sense. If you look at the profitability of the customers and the price that they can get for their devices right now. So generally, I don't think there is any issue with the upgrades. And the upgrades that are currently not happening will happen later and it is really -- and it is not even seasonal. It's that as Q3 or Q4, it doesn't really matter. And as long as the business, and especially the memory business of our customers' stays really strong, that means that the upgrades that they planned earlier, in the end don't want to do , because there is a revenue downside that they don't want to take. So this will just move on, maybe it will move to 2019. And as long as the memory business stays healthy or stays very strong, they will keep pushing back those upgrades to a point in time where they have to do it. So it is all, you could say deferred revenue to a point where customers can allow it, and there was nothing more to it. If you then say, that wasn't meant to the installed base as well, the installed base making year-on-year, that's probably likely to be flatter than we anticipated at the beginning of the year and that's simply is caused by what I just talked about.

Q - John Pitzer {BIO 1541792 <GO>}

That's helpful, Peter. Then is my follow-up. Just as you make progress on improving EUV wafer throughput per hour, one of the trade-offs we are hearing is, just as you raise power on the tool, the offset has kind of increased consumable costs for the customers, especially with radical life. Is that meaningful consideration on the ROI for your customer and rate of adoption. And then is there anything that you can do at the tool level to help on the consumable cost side?

A - Peter Wennink {BIO 1852674 <GO>}

Yeah, I think when you think about the telcos for instance and we're working constantly on lifetime of the consumables. And I think that is not major hindrance for our customers to start introducing a higher productivity tool, because the benefits of the higher productivity are so large that they can deal with the initial higher cost of the consumables. But we as an industry are all working on driving the cost of the consumables down. You have to realize that, when you take telcos it is only very recent that we started to have telcos that can withstand 250 watt. So it's just a matter of time and matter of learning curve, that's not going to be a major issue. And in the discussions that we have with our

customers on the 3400C on a high productivity tool. There was no concern at all in this direction.

Q - John Pitzer {BIO 1541792 <GO>}

Perfect. Thanks.

Operator

Next question is from Mr. Mehdi Hosseini. Please give your company name and ask your question.

Q - Mehdi Hosseini {BIO 4362002 <GO>}

Yes, thank you. Mehdi Hosseini, SIG. Peter, I have two follow-ups. You talked about the internal capacity to be able to ship at a minimum of 30 EUV system in 2019, can you help us understand perhaps qualitatively about the breadth of customer or diversity and should we expect any application to be included in these targets and I have a follow-up.

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think the breadth of the customer diversity clearly, DPV. You can look at the order book, I mean it's been driven by the top three customers that we have in both logic and in memory and that will be the drivers also for our shipments in 2019 and we -- are now planning DRM is going to be part of that. So it's the top three customers. But there again, you should also see in 2019 customers following both in memory and in the logic space starting to receive their first EUV production tools. But again, the top three customers will drive the bulk of the business, including DRAM.

Q - Mehdi Hosseini {BIO 4362002 <GO>}

Sure. And the reason I asked the question is, it seems to me that there's a bifurcation among your logic/foundry customer, were one particular customer is pulling away winning all the designs. And I'm just wondering how you think about the -- any potential downside risks is that particular customer continues to win all the designs for 7 and a 5-nanometer.

A - Peter Wennink {BIO 1852674 <GO>}

We look it as -- from an industry segment point of view. I mean, we wish all our customers the best and we hope to that they compete fairly on one win and the other ones. But as an Industry segment, we are not that concerned, because we are concerned about the ultimate demand for the 7-nanometer devices and the 5-nanometer devices which are driven by the value that is being created by those devices which will be taken up quite the customers of our customers. So the end-markets will in the end determine what the demand will be for EUV wafers, and where we going to ship them, we'll just have to wait and see who wins the business.

So what we ship is determined by end-markets and the customers of our customers, not perse by our customers from the segment point of view -- from an industry segment point

of view.

Q - Mehdi Hosseini {BIO 4362002 <GO>}

Just to be clear, your capacity to ship 30 plus, that doesn't include any upgrades, correct?

A - Peter Wennink {BIO 1852674 <GO>}

That's correct, yes.

Q - Mehdi Hosseini {BIO 4362002 <GO>}

Okay, thank you.

A - Skip Miller {BIO 20244900 <GO>}

Okay.

Operator

Following question is from Mr. Amit Harchandani. Please state your company name and ask your question.

Q - Amit Harchandani {BIO 16134002 <GO>}

Good afternoon. Amit Harchandani from Citigroup and thanks for taking my question. My first question relates to maybe an update from your side with respect so the e-beam business. If you could kindly share with us what is the progress in terms of the roadmap of the new product as well as potentially customer attraction and how should we think about that shaping up going towards the 2020 target? And I have a unrelated follow-up?

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think the e-bean business, we showed you last quarter's -- some same pictures of 2/3 [ph] multi-beam prototype which are basically we are building today and we will ship that commercially to our customers in 2019. But that will not end, there will be a next version which has more beams in 2020. So currently, it's execution of the R&D in all program making sure we can ship the first 3/3 e-beam tool in 2019 and more will follow in '20.

Q - Amit Harchandani {BIO 16134002 <GO>}

Okay. And as an unrelated follow-up, when we think about your installed base management revenues. And as you said, EUV tool gradually move out of their warranty period. Could you maybe help us understand, if there is step-up in the opportunity you get in the installed base management side with respect to EUV with the associated process revenues be dramatically different or higher than what you're generating today for DUV?. Thank you.

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think, the service revenue per tool will be significantly higher, but also the costs are significantly higher. You could argue with the EUV and the source, we have some consumables, I would say wearables with the EUV collector of time and some other parts of that tool. So that needs to be replaced from time-to-time and I think the service charge is now based on a charge per wafer. So yes, you will see a step, that once you see a significant number of our EUV systems coming out of warranty. And when they are more productive, they will produce more wafers which gives us an upside in the service revenue, but also clearly when you have more wafers, then you also have an impact of your cost of the wearables.

So that all in all, the increase in EUV shipments coming out of warranty. After 2020, we'll definitely give an impetuous to our service top-line, whereby as we've said on earlier calls, EUR5 million to EUR6 million of service revenue per EUV system is currently what we are planning or what we have in our long-term financial models.

Now clearly, when we have higher productivity and we can sustain that, then there is some upside to that number. But this is what we are working with beyond 2020.

Q - Amit Harchandani {BIO 16134002 <GO>}

Thank you, Peter.

Operator

Next question is from Mr. Robert Sanders. Please state your company name and ask your question.

Q - Robert Sanders {BIO 19087450 <GO>}

Yeah, hi. It's Deutsche Bank. First question will just be on the 3400C. Looks like you're making good progress there on availability, but that won't ship until the middle of next year. So how do you ensure customers don't defer taking delivery of the older generation B tool in situations where they don't have to ramp before 2020? And I have a follow-up. Thanks.

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think the customer's ramp plans are based on a certain capacity that they need for EUV wafers. Now the 3400C in 2019 is not going to fulfill that capacity on his own. You need the 3400B, yeah? But that is a fully equipped high volume productivity tool which of course has a lower price. So you get fewer wafers, but you pay a lower price. So it is, in that sense relatively simple that the EUV wafers that are needed in 2019, they need to be made and it can only be made in a mix combination of 3400B's and 3400C's and that's pretty clear to our customers and pretty clear to us. And that's why we say the 30 units that we have in our capacity plan as very valid. But I cannot give you any details yet on the mix or the combination a B and a C.

Q - Robert Sanders {BIO 19087450 <GO>}

Okay, great. And just one point of clarification. I just wanted to check that you said that both Q4 sales and Q4 profit would be higher than the third quarter. I just wanted to check that, what you just said, you indicated a rough kind of direction. Thanks.

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. Well, the rough direction is as follows. Q3 to Q4 sales will be up, and H2 sales and profitability will be up as compared to H1.

Q - Robert Sanders {BIO 19087450 <GO>}

That's perfect. Thank you very much.

A - Peter Wennink {BIO 1852674 <GO>}

Thank you.

Operator

Next question is from Adithya Metuku. Please give your company and ask your question.

Q - Adithya Metuku {BIO 17642884 <GO>}

Yeah. Good afternoon, guys. It's Bank of America. So, just looking at the gross margins on new EUV revenues in the second quarter -- in your third quarter rather based on your guidance. It looks like you will be doing something like 38% gross margin on your EUV revenues in the third quarter, and this uplift is not coming from any deferred revenue recognition. So in light of this, can you provide some color on how much higher your EUV gross margins in 2020 can be, higher than the 40% you've guided for, especially given the ASP and productivity of new EUV tools will be higher than what you had been planning previously? Thank you.

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think what I would suggest you to do, because the 38% gross margin is not something that I can easily relate to. So why don't you after this call, get in touch with our IR folks and they will probably can help you understand where you -- that they can understand where you're coming from and your calculation of the 38%. Because everybody with 38% in Q3 than 48% in 2020 would be really sandbagging. So -- and that's probably not what you are suggesting. So somewhere, we may probably need to help you understand this or we need to understand what you're thinking is. I don't think this call is suitable for that. So I would ask you to call our guys.

Q - Adithya Metuku {BIO 17642884 <GO>}

And just as a quick follow-up then, where are your EUV gross margins in the third quarter?

A - Peter Wennink {BIO 1852674 <GO>}

We don't guide specifically on the EUV gross margins, but we can say, we've given you some guidance in the past of the year. I would say gross margin improvement to the 40%

being almost on a linear scale from where we were in 2017. I think that is year-on-year, that is approximately correct and we are on that trajectory. So we're not guiding on the quarterly, we're guiding year-on-year in a more general terms. And there's some upside there that I would agree to if people say fine. If you start selling higher productivity tools in 2020 with some higher productivity and some higher value, that might be a support of your 40% margin target for 2020 which I explained in one of the first questions.

So no quarterly guidance. The linear improvement from 2017 to 2020 that's what you have to deal with.

Q - Adithya Metuku {BIO 17642884 <GO>}

Okay. Okay, thank you.

Operator

Our next question is from Ms. Tammy Qiu. Please state your company name and ask your question.

Q - Tammy Qiu {BIO 17604871 <GO>}

Hi. Thank you for taking my question. So, I only have one question. So you talked about you accelerating your EUV R&D process, does that actually change your estimation of the layer count we can see in the logic and foundry initial adoption, because I remember you actually said 10 to 15 layers insertion in the first phase. Does that actually increase the potential layers EUV can address, because you are actually doing better than previously expected.

A - Peter Wennink {BIO 1852674 <GO>}

Well, I think Tammy, initially not. I mean, customers have done their designs, they've done the qualification, I mean that's what it is. But I think clearly 2020 and beyond having a better cost per wafer to higher productivity clearly creates an opportunity for customers to start thinking of adding more layers. But initially I would say, they stick to where we are today because it would probably too much of a hassle to do that. They're going to start 7-nanometer like I said in 2019. They're going to be use the 3400B for it and over a time, you'll see an increased productivity. We'll likely have an impact on the number of EUV layers.

Q - Tammy Qiu {BIO 17604871 <GO>}

Okay. So Pete, you actually mean the adoption layer increase can actually accelerate based on your accelerated roadmap of EUV?

A - Peter Wennink {BIO 1852674 <GO>}

I think so, because it's a matter cost, but now it's a matter of when, I don't think it happens in 2019, that will happen probably 2020 and beyond.

Q - Tammy Qiu {BIO 17604871 <GO>}

Okay, thank you.

Operator

Next question is from Mr. Douglas Smith. Please state your company name and followed by your question.

Q - Douglas Smith {BIO 1541729 <GO>}

Hi, it's Doug Smith from Agency Partners. I've a longer term question about high-NA. I think in the last call, you said that the R&D units that are going to be shipped were priced at around EUR270 million. I recall some time ago the R&D units for low-NA on EUV were about 60, and now we see it's obviously much higher than that. Is the expectation that high volume manufacturing high-NA is going to be EUR350 million per unit. That's my first question. And second, the production capacity for high-NA you are putting in at Zeiss [ph] and Eindhoven. Is it targeting around a 20 unit level for mid-2020s?

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think on your last question, we're going to give you a bit more detail on the supply capacity around 2025 at the Capital Markets Day. But on your question on the R&D tools, you have to realize that when we started EUV, it was completely new technology. So with our first EUV low-NA R&D tool was really a research tool. While we think about high-NA EUV, it's the second generation EUV whereby for instance, we use the same source. We have a mature EUV resource by that time which, maybe we had the 60 million. That was a very immature EUV source that was not able to produce many wafers.

Now the high-NA tool will actually benefit, and that means that the R&D tool will be extremely close to the high volume configuration. So it actually means that R&D is almost the same as the high-NA tool, sorry, as the volume tool, which is the same as the current DPV tool. If we sell, a NXT 2000 which will be used in R&D first, that tool will also have the same configuration and the same price as a tool that was used in high volume that will also the same for high-NA. So the comparisons that you've made between low-NA and high-NA is really a comparison between immaturity and maturity and that's why it doesn't add up. But I would say 270 million for high volume tools still a pretty good price.

Q - Douglas Smith {BIO 1541729 <GO>}

Sure. That's a very good price. And just a quick follow-up. I think it was mentioned also previously the wafer throughput for high-NA would be greater than current low-NA. Do you think it might actually be able to exceed 200 wafers per hour eventually?

A - Peter Wennink {BIO 1852674 <GO>}

Well, I think this is something that we're very happy to answer at our Analyst Day, because that's where we'll go into those details. I mean, like I said earlier, we have now a roadmap that we're working on for our low-NA tool, which starts at the next, starting from 125, the next data point is 155 and it goes beyond that 155 and we'll tell you then how much. But it

also -- we will show the roadmap of high-NA and whether that goes over 200 wafers per hour. We would like to say, if that's what a date, otherwise it doesn't make sense to have a Capital Markets Day because everything is known by that time.

Q - Douglas Smith {BIO 1541729 <GO>}

Sure. Thanks. I'll wait for November then.

A - Skip Miller {BIO 20244900 <GO>}

Ladies and gentlemen, we have time for one last question. If you were unable to get through on this call and still have questions, please feel free to contact ASML Investor Relations department with your question. Now, operator may we have the last caller please.

Operator

Yes, sir. The last question is from Mr. Mitch Steves. Please state your company name and ask your question.

Q - Mitch Steves {BIO 19155169 <GO>}

It's Mitch Steves from RBC Capital Markets. Yeah, I just had a quick one to follow-up on the EUV comments about pulling-in kind of the spending there. So is that mean that you are essentially have a lower spending going forward. I just want to understand the implications from the operating margin front assuming the gross margins continue to try to plan.

A - Peter Wennink {BIO 1852674 <GO>}

Yeah. I think the EUV spent in terms of the acceleration, the acceleration R&D programs that will bring the productivity of the 200, 255 wafers per hour to pull that in. But also to accelerate that productivity beyond 255 wafers per hour, that R&D program will start around now. There'll also be still a program running in 2019 that's what I said. That ultimately when you get to the highest level of productivity on the 3400s that's the point through G&A too, that will reach a certain maximum then before that time, that R&D will tail-off for that particular part of the EUV program.

At the other hand, we will then see that high-NA comes up. Now, what the impact will be on the total R&D has to be seen in the context of total sales of the company at that time, and I believe that the progress of EUV will provide us with ample opportunity to drive the topline, because EUV will be more and more cost effective going forward. And that top line will enable us to spend R&D that we need and we will be more detailed like I said in November timeframe when we put this into the context of the total long-term financial planning of the company.

Q - Mitch Steves {BIO 19155169 <GO>}

Perfect. Thank you.

A - Skip Miller {BIO 20244900 <GO>}

All right. Before we sign off. Yesterday you should have received an invitation to our Investor Day which will be here in our headquarters in Veldhoven on the afternoon of November 8. Please let Investor Relations know if you did not receive an invitation and we hope you will be able to join us in November. Now on behalf of the ASML's Board of Management, I would like to thank you all for joining us today. Operator, if you could formally conclude the call, I would appreciate it. Thank you.

Operator

Ladies and gentlemen, this concludes the ASML's 2018 second quarter financial results conference call. Thank you for participating. You may now disconnect your line.