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Lam Research Corporation (LRCX) CEO Tim Archer on Q1 2020 Results - Earnings Call Transcript

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FQ1: 10-23-19 Earnings Summary

Press Release SEC *10-Q*

EPS of $3.18 beats by $0.16 | Revenue of $2.17B (-7.08% Y/Y) misses by $-2.26M

Earning Call Audio

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Lam Research Corporation (NASDAQ:LRCX) Q1 2020 Earnings Conference Call October 23, 2019 5:00 PM ET

Company Participants

Tina Correia - Corporate Vice President of Investor Relations

Tim Archer - President & Chief Executive Officer

Doug Bettinger - Executive Vice President & Chief Financial Officer

Conference Call Participants

Atif Malik - Citi

C.J. Muse - Evercore ISI

Harlan Sur - JP Morgan

John Pitzer - Credit Suisse

Timothy Arcuri - UBS

Toshiya Hari - Goldman Sachs

Krish Sankar - Cowen and Company

Patrick Ho - Stifel

Craig Ellis - B. Riley FBR

Vivek Arya - Bank of America Merrill Lynch

Joe Lachky - Wells Fargo

Mitch Steves - RBC Capital Markets

Operator

Good day, and welcome to the September 2019 Quarter Financial Call for Lam Research. At this time, I'd like to turn the conference over to Ms. Tina Correia, Corporate Vice President of Investor Relations. Please go ahead ma'am.

Tina Correia

Thank you, operator. Thank you and good afternoon everyone. Welcome to the Lam Research quarterly earnings conference call. With me today are Tim Archer, President and Chief Executive Officer; and Doug Bettinger, Executive Vice President and Chief Financial Officer.

During today's call, we will share our overview on the business environment and review our financial results for the September 2019 quarter and our outlook for the December 2019 quarter. The press release detailing our financial results was distributed a little after 1:00 P.M. Pacific Time this afternoon. The release can also be found on the Investor Relations section of the Company's website along with the presentation slides that accompany today's call.

Today's presentation and Q&A includes forward-looking statements that are subject to risks and uncertainties reflected in the Risk Factors disclosures of our SEC public filings. Please see accompanying slides in the presentation for additional information. Today's discussion of our financial results will be presented on a non-GAAP financial basis unless otherwise specified. A detailed reconciliation between GAAP and non-GAAP results can be found in today's earnings press release. This call is scheduled to last until 3:00 P.M. Pacific Time. A replay of this call will be available later this afternoon on our website.

With that, let me hand the call over to Tim.

Tim Archer

Thanks, Tina, and welcome everyone. In the September quarter, Lam delivered solid results. Our continued execution to commitments, combined with our guidance for the December quarter increases our conviction that Lam is in a strong position to outperform as wafer fabrication equipment spending inflects higher. Doug will cover the financial results in more detail shortly, but I'm especially pleased with the demonstrated earnings power of the Company. At the midpoint of our December guide, calendar year 2019 diluted earnings per share will be the second highest in our history despite the current industry cycle.

I would like to take this opportunity to thank our customers and partners for their continued support of Lam and our employees throughout the world for their contributions to these results. From an industry perspective, we have revised upward our view on 2019 WFE to the mid $40 billion range versus our prior estimate of down mid-to-high teens percentage year on year, which implied a low $40 billion level of spending.

We are beginning to see improvement in the memory market, led first by NAND. NAND's demand dynamics are improving and oversupply conditions should continue to abate as we move through the December quarter. We expect to exit 2019 with a bit supply growth rate for NAND of approximately 30%, which is well below our view on long-term demand; and as a result, NAND inventories are expected to decline to normalized levels in the first half of calendar 2020.

While the timing of the memory equipment spending recovery is always hard to predict, we are encouraged that customers continue to manage supply growth even as we are starting to see favorable end-market demand indicators. This is a sign of a healthy industry and a good setup for increased NAND spending in 2020. On the DRAM front, inventories have remain elevated, and we do not expect them to reach normalized levels until the second half of 2020.

However, we see positive demand catalyst ahead in both the server and smartphone markets. Our server CPU upgrade cycle is expected to begin next year with increased adoption of new generation platforms from leading manufacturers. For smartphones, major vendors are planning to launch additional 5G models which is expected to drive content growth for the overall smartphone market in 2020.

Turning to foundry and logic, spending in this segment has been strong throughout 2019 and based on recent customer commentary, looks to remain so heading into next year. Diverse end market applications are driving higher levels of foundry and logic spending, moreover, challenges in scaling functional block such as SRAM and logic devices are leading to increases in die sizes and these in turn are accelerating changes in device architectures and chip manufacturing technologies.

Lam's growing position with key foundry and logic customers has positioned us to incrementally benefit from these secular trends. Competitively, we are executing at a high level. Based on the midpoint of our December guidance, Lam's 2019 foundry and logic revenues are set to significantly outgrow announced customer CapEx plans. The share gains we are now seeing in the foundry and logic segment are the result of close customer collaboration and strong product execution over many years and multiple technology transitions. They are evidence of the benefit of sustained investment in R&D throughout industry cycles.

Looking at the market as a whole including memory, foundry, and logic, we are on track in 2019 to deliver our best ever penetration and defense performance, as measured by net forward-looking, three-year revenue opportunity for application decisions made in this calendar year. A key contributor to our strong penetration and defense performance has been continued focus on technologies that enable 3D device architectures, which are becoming increasingly important to performance and cost scaling across all market segments.

We invested early in 2D to 3D inflections; and as these transitions are occurring, we are seeing expansion in both our SAM and market share. Etch and deposition processes are critical enablers for 3D scaling, and we are investing aggressively to deliver the technology and productivity innovation required to satisfy customer roadmaps. As evidenced by our penetration and defense wins this year, we believe we are extending Lam's leadership in this space.

In 3D NAND, we're successfully defended 100% of our memory whole dielectric etch positions and continue to be the supplier for this application at all 3D NAND manufacturers. We are also winning 3D NAND applications where productivity is the primary point of differentiation. Notably, Lam has been the first to deliver production proven edge-yield solutions for etch. In this quarter, we used our Corvus tunable edge hardware on our flex dielectric etch system to improve profile tilt uniformity and win an important productivity sensitive slit etch application.

On the conductor etch front, we won a 3D NAND application for a new vertical architecture that reduces die size and is a technical solution for lowering bit cost. In deposition, we recorded an important 3D NAND win for the VECTOR DT, which deposits backside films to control stress as layer counts increase. Another significant deposition win was for our Striker ALD tool used to deposit high quality liners and gapfill as aspect ratios get higher.

We also continue to extend our 3D expertise and position outside of the 3D NAND space, including in rapidly growing markets such as advanced packaging and heterogeneous integration. Over the last three years, the installed base for our SABRE 3D electroplating system has grown by more than 70%, and we are the leading electroplating supplier for TSV, for DRAM, CMOS image sensor, and logic devices.

Our SABRE 3D electroplating solutions embed best-in-class technology backed by years of high-volume production experience. With each successive win across our served markets, the installed base of Lam equipment continues to grow, resulting in an expanding long-term revenue opportunity for our customer support business.

To create value for customers over the entire lifecycle of tool ownership, we are actively developing upgrades and advanced services targeted at extending technical capability and increasing productivity from existing installed base assets. These offerings help our customers reduce their total cost; and as a result, we continue to see growing demand.

Revenues from our customer support business grew in the September quarter on a sequential basis and our Reliant business achieved record quarterly revenue for the third quarter in a row. We expect 2019 overall will be another growth year for our customer support business.

Looking at our year-to-date performance, we have made tremendous progress against our objectives of expanding our SAM, increasing our market share, and building our installed base business. Importantly, 2019 has been a year where Lam has strengthened its position in the foundry and logic segment.

Also, with early indications of improving NAND demand and positive catalyst on the horizon for DRAM, we are increasingly optimistic the calendar year 2020 is setting up to be a year of outperformance for Lam as spending mix moves back in our favor.

Thanks again for joining today and now here's Doug.

Doug Bettinger

Okay, great. Thank you, Tim, and good afternoon everyone, and thank you for joining us today on what I know is a busy earnings season. We're pleased with Lam's performance in the September quarter. Our results once again exceeded the midpoint of guidance for all financial metrics. Operating income and diluted earnings per share came in at the high-end of our guidance range as we remain prudent in managing our spending throughout the quarter.

Let me begin as I always do by talking about our revenue segmentation in the September quarter. The combined memory segment was flat with the June quarter at 64% of total systems revenue. We had a decrease in the September quarter in the nonvolatile memory segment, moving from 46% to 38%, while DRAM increased from 26% from 18% of assistant revenue.

Spending in the NAND segment was focused on multiple nodes and we're beginning to see the first ramp of 128 layer structures. On the DRAM side, apart from the 1x and 1y nodes, we're seeing initial investments at 1z. As I noted on our last quarter earnings call, foundry and logic spending was strong and we expect strength from this segment to continue to the remainder of the calendar year.

The foundry segment represented 25% of our systems revenue in the quarter. Strength in this segment is related to spending on the 7 and 5 nanometer nodes. Logic another segment was down slightly from the prior quarter level coming in at 11% of system revenue. We continue to demonstrate strong progress in the foundry and logic segments, enabling us to maintain solid profitability levels during a period of depressed memory spending.

I believe probably foundry logic spending will be even stronger in December. Revenues for the quarter came in at $2,166 million which was again above the midpoint of guidance. Our revenue had a slightly broader geographic mix in the September quarter, compared to the June quarter. Our top reasons continue to be China, Korea and Taiwan.

The China region quarter performance remains higher than our historic average concentration of revenue. And similar to what I talked about last quarter, the majority of this came from indigenous Chinese customers across multiple segments.

Gross margin came in at 45.4% which was 40 basis points above the midpoint, mainly due to customer mix. And as we stated in prior quarters, you should expect gross margins to be a function of several factors such as business volumes, product mix and customer concentration, and we expect to see variability quarter to quarter.

We continued manager spending levels in the Company as operating expenses in the September quarter declined to $431 million which was down from $450 million in previous quarter. We remain laser focused on investing in research and development programs, as we saw the percentage of spending and R&D increased quarter-over-quarter to 67% of operating expenses.

The December quarter the guidance reflects total spending, increasing back to the June level, primarily due to an increase in variable compensation expense. A variable compensation fluctuates based on the level of quarterly profitability.

I'm going to also remind you that as we look ahead to the 2020 calendar year, you will see the normal seasonal spending increases related to the March quarter, comes from things like payroll taxes.

Operating income in the September quarter was $552 million and operating margin was 25.5%, at the top of our guidance range. Our September quarter non-GAAP tax rate was approximately 11% which was slightly lower than our long term rate. There will be fluctuations in the rate from quarter to quarter and we now expect our long term rate to be in the low teens level.

Other income and expense was a total of approximately $11 million in expense in the September quarter. The main components of other income and expense our interest income from the cash and investment balances we hold, offset by expense related to our outstanding debt. The total interest expense and all tranches of our debt is right now about $41 million per quarter.

You should expect that other income and expense will fluctuate quarter-to-quarter, based on several market related items such as; our deferred compensation assets, venture capital investments and foreign exchange. We continue to execute on our capital return program during the September quarter. We allocated $234 million to capital return in the quarter with $75 million related to open market share repurchases and $159 million in dividends.

I would like to remind you that we continue to have an ongoing structured repurchase program that is expected to mature in the December quarter. This will continue to reduce our share count. We remain on track with our committed capital return. We currently have approximately $3 billion remaining in our Board authorized share repurchase program.

Diluted earnings per share came in at $3.18, which was at the high end of the guidance range that we provided for September. We ended the September quarter with diluted shares for earnings per share at approximately 151 million shares, which is the seventh consecutive quarter where our diluted share count has declined. The share count includes a dilutive impact of approximately 5 million shares from the 2041 convertible notes. And I'll remind you the dilution schedules for the remaining 2041 convertible notes is available on our Investor Relations website for your reference.

Let me now switch to the balance sheet. Our cash and short-term investments, including restricted cash, increased slightly in the September quarter to $5.8 billion from $5.7 billion in the June quarter. Cash flows from operations were $464 million, which was offset by share repurchase and dividends. Year-to-date in calendar year 2019, we have had strong cash from operations performance and we're on track to end this year with the second highest level of free cash flows in the Company's history.

DSO increased to 69 days versus 56 in the prior quarter. The DSO increase is related to the timing of customer payments occurring at the end of the September calendar month, which falls within our December fiscal quarter. Our inventory balance declined sequentially by $57 million, which is the fifth consecutive quarter where inventory balance decline. Inventory turns were 3.2 turns, which was just a little bit less than the 3.3 turns that we saw in the June quarter.

Non-cash expenses included approximately $43 million for equity compensation, $49 million for depreciation and $16 million for amortization. September quarter capital expenditures came in at $39 million, which was a decrease from $66 million in the June quarter. Our September quarter-end headcount was flat with the prior quarter at approximately 10,700 regular full-time employees.

So now looking ahead I'd like to provide our non-GAAP guidance for the December 2019 quarter. We are expecting revenue of $2,500 million, plus or minus $150 million. Gross margin of 45% plus or minus 1 percentage point, operating margins of 27% plus or minus 1 percentage point.

And finally, earnings per share of $3.80 plus or minus $0.20 based on a share count of approximately 150 million shares. I'm pleased to share with you the results we've delivered throughout calendar year 2019 and what has been a challenging industry environment. As Tim noted the supply demand environment is improving for the memory segments and we've made good progress in our foundry and logic positioning. Our installed base business continues to be on track to deliver a growth year in 2019. We're well positioned heading into 2020 and are optimistic about our future performance going forward.

Finally, I'd like to announce our plans to host an Investor Day on March 3rd, 2020 in New York City. Details on the venue and precise time will be forthcoming.

Operator, that concludes my prepared remarks. Tim and I would now like to open up the call for questions.

Question-and-Answer Session

Operator

Thank you. [Operator Instructions] And we'll take our first question from Atif Malik with Citi.

Atif Malik

Question on the WFE, Tim, you mentioned WFE going from low $40 billion to mid $40 billion. I wanted to understand if the majority of the increase has come from the foundry/logic segment in terms of the revised outlook?

Tim Archer

Maybe a few modifications, I mean, clearly, as we've said, we've continued to see strengthening in foundry and logic. So that is a portion of it. The -- some very early indications of NAND spending increase as we have now guided for December quarter. And finally, continuing strengthening in the China WFE as we've, kind of, seen increased strength throughout the year. So a combination of all those things, lead to our upward revision in WFE.

Atif Malik

Okay. And then a follow-up in your prepared remarks, you mentioned foundry/logic share gains above foundry/logic CapEx this year. How should we think about the outperformance of your foundry/logic business into next year and out given there’s some of the elements like reuse and growing EUV steps?

Tim Archer

Well, that's a great question, we basically -- as we have said on a number of occasions, the intensity of etch and deposition we see continuing to increase at every technology node. Our SAM grows, whether it'd be 10 to seven to five to three on into the future. SAM increases even in the face of EUV increased usage. And there's a number of reasons for that; patterning complexity continues to increase regardless of the introduction of EUV, and so there are additional steps for deposition and etch.

EUV itself introduces new requirements for hardmask, which gives Lam opportunity to participate from a deposition perspective. And EUV also, we have talked about in the past introduces opportunities for new steps like and processes like atomic layer etching that can be used to help increase quality and productivity of the EUV pattern itself. So, I think the way you should think about it is our SAM is expanding, competitively our -- we're gaining share at some of these new layers, and we feel we're well setup in both the foundry and logic space going forward as technology transitions.

Operator

Thank you. We'll now take our next question from C.J. Muse with Evercore.

C.J. Muse

Yes. Good afternoon thank you for taking the question. I guess first question, if we look back through to 2018, it looks like your share of wallet for WFE with NAND is roughly 30%. So curious as you think about moving to a rising layer count and your leadership in the high aspect ratio etch, and the just announced deposition wins on the call tonight, how should we think about your share of wallet as we go to 128 layer and above into 2020?

Tim Archer

Our SAM as a percentage of customer spend continues to increase with layer count, and that's for two reasons; one, I mean obviously the simple fact of building and etching the higher stack, but also the fact that, as I mentioned there are new steps and new opportunities that get created for dealing with issues such as; in the VECTOR DT case the stress associated with those taller layer counts. So, I think that our view is SAM grows as layer count increases.

C.J. Muse

Thanks, Tim. And I guess as a follow up, Doug, I'm not sure if you spoke to the entirety of installed base revenues, but did they grow sequentially in September? And how should we think about the trend? Or what should we kind of model it to into 2020?

Doug Bettinger

Yes. C.J., I think, Tim, actually mentioned in his prepared remarks that they did grow sequentially and it was the third consecutive record quarter for the Reliant component of that business. I'm not going to quantify next year yet, a little bit too soon. But what we said in the past and I can continue to be very comfortable saying today is, I have a hard time envisioning a year when the installed base business doesn't grow, it should grow every single year because chamber count grows every year, it's growing this year, even in a depressed memory spending environment, and we continue to bring new advanced service offerings to market that we hope enable us to achieve more and more of the customer's OpEx spend. So that's how you should be thinking about that C.J.

Operator

Thank you. We will now take our next question from Harlan Sur with JPMorgan.

Harlan Sur

This is the second quarter in a row of the heavier China domestic mix. Do you guys anticipate this bias to continue into the December quarter and into next year and similar to my question last time? Is this in your view a focused effort by China to accelerate their semiconductor manufacturing capabilities, given the trade tensions with the U.S. or more your China customers just having more confidence to move forward with their early memory and foundry programs?

Doug Bettinger

Yes, Harlan, what I've tried to describe in fact, I tried to foreshadow it last quarter in earnings that this is above normal run rate of local Chinese customers spend. But Tim did point out in his remarks that some of the strengthening in WFE came from local China, probably now and nominally somewhat about $6 billion in WFE. And as we look into next year, we absolutely think it will grow again next year, but it will ebb and flow, it will -- these big projects can be lumpy at times, and it will go up and it will go down depending on when equipment ships into any one fab project. Tim, do you want to add anything?

Tim Archer

Yes, I think that -- as I commented, we've seen strengthening in domestic China spend through the year, anticipate that continuing and maybe the most important part of that story for Lam is that clearly a big portion of the new incremental spending in China is targeted toward the memory market. And obviously our SAM, and our share in the memory space is quite good, so from that perspective we see China as an area of strength for us.

Doug Bettinger

Yes, Harlan, I forgot the one part of your question you asked, do we think anything pulled in? Actually really don't, I don't think it would make sense that they would be pulling things in sooner and because if you're concerned about our inability to ship being the reason they pulled in, then they can get spares and service from us, they can't actually really utilize the tools very well. So I don't believe that there was pull-ons really do anything like that.

Harlan Sur

Great, thank you. Thank you for the insights there. And the team continues its strong design win momentum on non-critical and/or legacy technology node. As part of it, as you pointed out is the Reliant systems products continue to do well. We continue to hear from your customers that they're laser focused on productivity throughput, uptime, footprint all of the things that impact overall wafer costs. Are you guys now in a position to at least give us some sense on how fast the non-critical/refurbished business systems -- business is growing? And roughly the size of this business relative to your total revenue base?

Tim Archer

Maybe you have to wait till Investor Day for that. No, we do plan -- we do -- we have promised for some time now to provide you more detail in those areas and we're just, we will do that. I think maybe a couple of points, your comment about customers being laser focused on productivity? I mean, it's one of the reasons why we have been talking about it, it takes some time for those products for our efforts to really start to show up in new wins.

But you know we're starting to see in this area that Doug talked about in advanced services, where some of these intelligent database tools are really starting to help us reduce, for instance troubleshooting time on the systems, reduced unscheduled downs on the systems and those are things that the customers are pulling hard for because again it's productivity for tools that are already in place and relatively easy to implement. So we are prioritizing productivity, because it's in the best interest of the customer and the industry as a whole.

Operator

Thank you. We'll hear now from John Pitzer with Credit Suisse.

John Pitzer

Yes, good afternoon guys. Thanks, let me ask the question. Congratulations on the strong results. Tim, I just want to go back to the market opportunity in logic/foundry for you. If you kind of look at calendar year-to-date that business combined for you was up somewhere between 30% to 40% year-over-year? I guess, I'm just trying to get a sense of how we think about your market position, maybe in North America as we see 14 go to 10 go to seven and maybe in Taiwan as we see seven go to five go to three, can you talk a little bit about how much visibility you have on product tool of record on some of these critical etch and deposition steps? And how we might think about your share opportunity as we migrate down these nodes?

Tim Archer

Sure, I can do that without quite getting as specific as North America, Taiwan on those notes. So maybe I'll point you just a couple of comments, I made and then embellish there was a little bit, you know, as I said it within the logic and foundry space, it takes many years to establish yourself as the first -- the development tool of record. And then ultimately see that rollout into volume buys is the production tool of record.

And so when we talk about I gave -- we gave a little bit of a new look into this penetration and defense. Forward-looking three-year revenue opportunity statement, that is designed to give some indication as to how long it takes from the time we win one of those selection decisions and you'll see that revenue opportunity will take place over those following three years, that's definitely true in the foundry and logic space.

And so I think that when we talk about improving opportunity at 10 and then seven and then five, you know, you can kind of look out and say, if you're like a 5-nanometer decision is revenue opportunities that now we're roll in over the course of the next several years. So that may not be quite the level of specificity you wanted, but it basically says things that we are winning now will actually be our revenue for the next three years plus in that space.

John Pitzer

That's helpful. And then, Doug, you mentioned in your prepared comments, you still have about $3 billion left on the buyback, and I apologize in capital allocation call, but this most recent quarter, the buybacks dipped down a little bit, which I guess is understandable, just given the level of uncertainty. Any color you can give us around the pace at which you might want to try to execute buybacks going forward? And how we should think about, kind of, just remind us again the cash return policy you're trying to hit?

Doug Bettinger

Yes, John, I mean, one thing I would point out to you and if you look over the last two years, you will have seen several quarters where the cash we actually deployed moved down somewhat. That was because in the quarter before that we put one of these accelerated share repurchase programs in place. You have the same phenomenon going on this quarter.

So even though the cash that we deployed in terms of open market repurchases wasn't all that significant this quarter, that ASR was still executing buying stock back, and that ASR that's currently out there will complete in the December quarter. So we'll be thinking about what we're going to do incrementally as we go forward.

So far, just remind you what we talked about and it's been a while now the last Analyst Day that we're committed to at least 50% of free cash flow returned to shareholders, and obviously if you look at our history, over the last five, six years, we've done a whole lot more than that. And I had went on the timing to complete the current authorization and I'm going to kind of remain that way. I've said in the past, we'll be opportunistic and that's as much as I have quite right now.

Operator

Thank you, we'll take our next question from Timothy Arcuri with UBS.

Timothy Arcuri

Thanks a lot. I guess my first question, Doug is can you help us a little bit with the mix in December. I'm curious, if the uptick in revenue is going to be more on the NAND side and more on the foundry side? Thanks.

Doug Bettinger

Yes, what I said, Tim in my remarks, was I expect December will continue to be pretty strong with foundry and logic quarter. So that's a key piece of what's going on.

Timothy Arcuri

Okay, awesome. And then I just wanted to -- I just wanted to drill down a little bit into the China piece. So China is about 25% of your revenues now on the trailing 12-month basis. So I guess, I'm curious how much of this is going into indigenous projects versus the multinationals. Because I thought you said China was about $5 billion of 2018 WFE, and I think at that time, you were talking about $3 billion of that $5 billion being domestic China.

And I think you just said that China is going to be over $6 this year. So, can you sort of like level set us on how much of that $6 this year will be multi-versus domestic and maybe how much domestic can even grow next year? Thanks.

Doug Bettinger

Yes, let me walk it back for you a little, Tim, because some things have moved around a little bit. When I look at what happened last year, local China ended up being I don't know $4.5 billion of WFE roughly. So it ended up being maybe a little bit more than that for that we have been talking about and the way we see it today, it's above $6, it's somewhat above $6. I don't know for sure what next year is going to look like. But as we look at our analytics in the fab projects that are coming in and whatnot, I do see pretty strongly believe it will grow next year. I'm not ready to tell you how much yet. We'll give you more clarity on our WFE view for next year on the next earnings call. But I think local China will continue to grow next year.

Timothy Arcuri

And, Doug just to clarify those numbers are local China numbers right?

Doug Bettinger

That's right, Tim. Yes.

Operator

Thank you. We'll take the next question from Toshiya Hari with Goldman Sachs.

Toshiya Hari

Yes. Thanks for taking the question and congrats on the strong results. Tim, you talked about early signs of a recovery in NAND in your prepared remarks. And Doug, you just mentioned that most of the growth or at least implicitly, I think you commented that most of the growth in December quarter should be coming from foundry and logic? So should we expect some of the NAND projects that we're all collectively hearing about should hit the March quarter from a rev rec perspective?

Tim Archer

Yes, it's maybe there is not such a big change here from what we've said. We -- you know, ever since beginning of the year, we said that memory spending would likely remain relatively weak throughout the year. And when I talked about early signs, it is the -- it's very early is in there, we're now starting to see some of those projects transpire as you just talked about, meaning a little bit of ordering occurring in the December quarter, but we still maintain our view that we exit the year with this 30% bit supply growth rate and that customers are prudently managing the supply growth, but I do think those projects, you know, it's kind of that early signs, it's a healthy industry and we're going to see growth in 2020. So exact timing, we really don't want to give you that right now, but it's -- it looks to be coming.

Toshiya Hari

Got it. And then as a follow-up, I just wanted to hit the logic and foundry opportunity dynamic into 2020. Obviously, you guys have done a great job over the past couple of years and gaining share in both buckets. If we assume that spending in logic and foundry is largely flat in 2020, and if you assume EUV adoption continues to grow. Based on what you guys know from a design win or application win perspective, can you still grow logic and foundry revenues in that sort of environment backdrop? Thanks.

Tim Archer

Yes, it's a great question and the answer is yes, we would expect to grow in that scenario, based on a couple of things; one, as you move forward, even on the same WFE, our SAM as a percent of that WFE should increase as transition still continued to occur to more advanced nodes. Etch and deposition opportunity increases at each successive technology node, even in the face of EUV. So I think in the scenario described, we would expect to have a larger opportunity and we do believe that we're winning share as well and therefore we would grow.

Operator

Thank you. We'll hear now from Krish Sankar with Cowen and Company.

Krish Sankar

Yes. Hi, thanks for taking my question. I had two of them; first one for either Tim or Doug. More a industry focused question you spoke about how NAND bit growth exiting this year is going to be 30%, kind of, curious like ask your customers start ramping 128 layer NAND, if next year demand bit growth is below 30%. Do you still expect the 120 layers spending to go through next year, because it's more strategic, low cost in nature? Or do you think it might get throttle back if demand bit growth is slower?

Doug Bettinger

Maybe I'll take and then Tim you can add-on. I mean, Krish what -- one I don't think that's what's going to happen. But we're that to be what happened, I think you would see a year that looked something like this year in that most of the industry spending was allocated to node conversions as opposed to new capacity adds, because that lowers cost per bit, the economics are better and all of that.

The other thing I would say, and then I'll let Tim add-on. When we look into early next year, I believe supply growth rate will continue to decline based on the investment set have occurred this year, right? Because they have reduced this year and so you're moving into a declining rate of growth, as we look into the first half of next year. Tim, anything you want to add?

Tim Archer

Yes, I think just to reiterate Doug's point, I mean, technology transitions we think occur every year, simply because of the benefit to bit cost. And so, I guess, I would say that in any year, which is not our view of declining supply growth we would still see the majority of the spend in technology transitions. And I guess there is one other key point to think about, we've mentioned this a few times in a technology transition from say 96 layers to 128 layers, the majority of that spend is for etch and deposition. So there's definitely an outperformance statement there, if spend continues to be based just on technology transitions.

Krish Sankar

Got it, got it. That's very helpful. And then as a follow-up, I think, Tim in your prepared comments you spoke about how you guys are successfully defended 100% dielectric etch market share. I'm kind of curious on the NAND side, is that a fair enough statement, if you look past 128 layer higher than 128 layer DTOR tools or is it more up to 128 layers?

Tim Archer

Well, in our statement is always as those decisions are made. So we always speak about accomplishing made. So I don't know if any decisions have been made well beyond the 128 layer node. So we -- it's obviously something that we compete for it every node. But, I guess what I'd point out is there is a very important piece of learning that has come from us running now millions of wafers through our dielectric etch tools.

And there was a question earlier about, productivity, reliability, stability, defect performance. Those are all things that again we have millions and millions of wafers of experience. And so kind of come in with an edge every node that you have to compete for as the incumbent. So that -- but specifically, I think, you could bucket most of those in that 128 nanometer and below node since their decisions already made.

Operator

Thank you. We'll hear from Patrick Ho with Stifel.

Patrick Ho

Thank you very much. And also congrats on a really nice quarter, maybe, Tim, first, a lot of the market questions have been answered on my end. But as you look at next generation memory technologies like MRAM, ReRAM. Can you just give a -- maybe a qualitative view of how Lam is positioning itself to capitalize on those next generation opportunities?

Tim Archer

Yes, I guess maybe the simpler statement that I make inside the Company is we're not running from our leadership position in memory, and that includes in these new emerging memory markets. And so we're actively looking to develop new applications, new tools that meet the needs of those devices. We've spoken about, one of them in particular so far this year, which is the ion beam edge tool, that's used for MRAM and we have established a very strong position for that particular application, phase-change memory ReRAM, there are other devices we are actively engaged in development with the leading companies. So it is a target market for us, in fact, one might argue that we feel we, sort of, we already sort of own that memory space and I think it's our focus.

Doug Bettinger

It's Dough. Just to add-on, if you really want more detail you can go look at the transcript of the Flash Memory Summit, where Tim and Rick Gottscho spent lots of time talking about how we view these emerging memory architectures.

Patrick Ho

Great. Thanks, Doug. And maybe as my follow-up question, you talked a little bit about your atomic layer deposition opportunity. I guess from a big picture perspective, how do you see the total available market for you in that? And do you see it expanding from where -- it looks like you have a strong position on the memory side of thing. Can this also expand onto the foundry/logic side of things?

Tim Archer

So we'd already has expanded, I mean, ALD is not memory specific. So we use these films also on the logic and foundry side. ALD atomic layer etching and atomic layer deposition and atomic layer etching, these are technologies that will continue to be increasingly used as devices become smaller and smaller and structures become more complex. So I think it's an expanding market opportunity, and in fact I think in coming years, you'll start to see inflections for instance from batch processing tools to single wafer ALD just again for the type of wafer uniformity and requirements of those processes going forward. So it's an area where we're growing and we feel confident about our development activities in the tools themselves.

Operator

Thank you. We'll hear now from Craig Ellis with B. Riley FBR.

Craig Ellis

Yes. Thanks for taking the question. Tim, I wanted to follow-up on the comments that you made that calendar '20 to be a year of outperformance for Lam. Can you just help us understand how much of that comes from moving deeper into the sweet spot of the foundry/logic share gain that you've been talking about versus help that you would get from what appears to be a nice and very encouraging upturn that's starting to occur in NAND or maybe something else like SAM expansion?

Tim Archer

Yes, I think for us to give you more detail on the break out on that you'll have to wait until we actually speak to our 2020 WFE outlook next quarter. But you kind of hit it, I mean, we -- the way I think about outperformance in 2020, it's just what you said. First and foremost you -- everyone knows that we are highly leveraged to the memory market, and we do believe that spending mix moves back in our favor next year.

And even in the face of stronger and continuing strength in logic and foundry memory will improve to some extent. We've strengthened our logic and foundry SAM opportunity, as well as share position and so that's a continued benefit as logic and foundry remain strong. And also as Doug mentioned CSBG continues to grow as we expand our portfolio of advanced services in that space. And so can break it out for you, how much each of those contributes, but each of them is important part of the story in 2020.

Craig Ellis

Thanks, Tim. And then I'll do the follow-up to Doug. Doug impressive trough-to-trough operating margin improvement of about 300 basis points. And within that there is dramatic improvement with operating expense as a percentage of sales. And as you noted, there's been significant mix shift R&D. The question is how much further benefit is there in the model for increased operating leverage? And how much room do you have to further drive expense toward R&D from SG&A?

Doug Bettinger

It's something we've been working on for years, I mean, Tim was driving those on years ago, honestly in rest of companies rally behind it. We're going to keep squeeze in efficiency out every SG&A dollar we spend. We want to be totally rigorous about that. So that we can allocate more of those dollars to R&D, I think that 60%, 70% last quarter might be an all-time high for the Company. I haven't gone all the way back, but in my recent memory that was an all-time high. We're going to keep at that, we're going to continue to try to get better, we do this every words part of the culture of the Company to be focused on continuous improvement. I don't know how we can get it obviously, but we're going to keep working on it.

Operator

Thank you. We'll hear now from Vivek Arya with Bank of America.

Vivek Arya

Thanks for taking my question. And I joined a little late, so I apologize if this was asked. But DRAM was quite strong in the quarter. And I'm wondering what caused that and how sustainable is that trend?

Tim Archer

When I look at it, it's primarily conversion spending. That's really what we've seen for the entire year is focused on node conversions, it will ebb and flow. The important thing when you think about DRAM is to understand when we look at similar to what we were describing NAND exiting the year below where we believe demand growth to be, you got a similar story in DRAM.

As we look at the investments that are occurring in DRAM this year exiting the year supply growth is probably in the low teens. And we believe long-term demand growth is in high teens maybe approaching 20%. There is a ways to go, Vivek to continue to burn inventory out of the channel. I think that's going to take a little bit longer. But what I do know is at some point the inventory will be burned off and spending will grow more significantly. In quarter-by-quarter, it's just going to be dependent on what projects are under way at what customers.

Vivek Arya

Got it, very helpful. And then as a follow-up, kind of, looking at your cash flow generation, so fiscal '19 from what I noticed there was a lot of cash inflow from working capital that I'm looking at the model right. How should we think about the plus and minus from working capital this year? Thank you.

Doug Bettinger

If you look at the first half of this year, Vivek -- calendar year again. I never really think too much in terms of fiscal calendar year. I mean we're -- cash was just super strong, I think we had two consecutive quarters around $900 million in operational cash flow and you're right. A lot of that came from working capital. Now what you normally see with the business when it's growing, it will consume working capital, meaning it will take cash to build inventory and receivables and so forth.

When it levels off or contracts, it will generate cash and that's really what went on in the first half of the year. I mean, we managed cash quite proactively, but the practical reality of business ebb and flow was that's what happens. The right way to think about the free cash flow of the business is it's a couple of points below where operational cash flow should be on a sustainable basis. But it will ebb and flow around wherever read in the business cycle.

Operator

Thank you. We'll take our next question from Joe Lachky with Wells Fargo.

Joe Lachky

Yes, thanks for taking the question. You talked about improvements and inventory that you've seen across the NAND flash. I was wondering, if you could talk about, to the extent you can, factory utilization rates and your installed base?

Tim Archer

It's hard for us actually to put our finger on exactly what utilizations are. I mean we saw it pulled back a little bit in both NAND and DRAM this year. And I think that was pretty well-telegraphed from our customers. But better -- it's a better question to put to them, we don't always know exactly what their utilizations are running at.

Joe Lachky

Okay, fair enough. And then maybe a follow-up to that. You talked about exiting this year at 30% supply growth, I mean, for NAND and maybe and potentially going lower than that next year on the first part of the year. I guess, the question is how do we think about the level of capacity expansion needed to hit kind of the -- I guess, expected demand growth for 2020?

Doug Bettinger

Tough question to answer Joe, to be honest. What's occurred this year and NAND largely has been conversions, maybe with a couple exceptions. But if you look at NAND, WFE through the year -- this year, but that's what was going on and you saw declining rate of supply growth such that as we exit the year obviously, we said 30% and I think long-term NAND growth is in the high '30s, maybe 40%. To have 40% supply growth, we need to be adding a few wafers every single year, and so it didn't happen quite so much this year and you've seen supply growth decline. I don't know if that helps you, but that's how I think about it.

Operator

Thank you. We'll take our next question from Mitch Steves with RBC Capital Markets.

Mitch Steves

Hey guys, thanks for taking my question. I really had two and most of them have been answered. But from a high level, I mean, do you guys talking about kind of a better market for memory in 2020. So when do you think we'll see capacity upgrades or is this all going to be technology upgrades?

And then secondly, you guys gave a lot of color on NAND, but not so much in DRAM. So based on the commentary about server demand and kind of an increase in Q1, does that mean you guys think that -- that's going to be kind of the bottom or do you think that exiting the year, we're going to start to see supply demand balance for DRAM?

Tim Archer

Well, I think that what we've said about DRAM maybe just was that we think through the first half of next year. Inventory remains elevated and so it's really not, I guess our view at this point is DRAM maybe more of a second half story for next year. Obviously we'll give far more color as we develop our full 2020 outlook. It's just that NAND is much more upon us right now. Simply because the issues are being worked through more quickly as a result of the supply constraints that have been in place this year and maybe also the demand catalysts for NAND that are occurring right now.

Mitch Steves

Got it. And is a capacity upgrades at what time in 2020 is that like back half or do you think capacity upgrades will begin earlier than that?

Doug Bettinger

Mitch too soon for us to talk in any detail about 2020, hold off for one quarter we'll give you a little better visibility on it. It's still a little bit too far away for us to get into detail.

Operator

Thank you. And that does conclude today's question-and-answer session. I'd like to turn the conference back over to Ms. Correia for any additional or closing remarks.

Tina Correia

Just wanted to thank you everyone for joining us today, appreciate it.

Operator

Thank you and that does conclude today's conference. Thank you all for participants. You may now disconnect.