Q2 2021 Earnings Call

Company Participants

- George S. Davis, Chief Financial Officer
- Joseph Moore, Morgan Stanley
- Patrick Gelsinger, Chief Executive Officer
- Tony Balow, Head of Investor Relations

Other Participants

- Ambrish Srivastava
- C.J. Muse
- Harlan Sur
- John Pitzer
- Matt Ramsay
- Ross Seymore
- Srini Pajjuri
- Stacy Rasgon
- Timothy Arcuri
- Toshiya Hari
- Tristan Gerra
- Vivek Arya

Presentation

Operator

Thank you for standing by. And welcome to the Intel Corporation Second Quarter 2021 Earnings Conference Call. At this time, all participants are in a listen-only mode. After the speakers' presentation, there will be a question-and-answer session. (Operator Instructions) As a reminder, today's program is being recorded.

And now I'd like to introduce your host for today's program, Tony Balow, Head of Investor Relations. Please go ahead, sir.

Tony Balow {BIO 21936645 <GO>}

Thank you, operator. Welcome to Intel's second quarter earnings conference call. By now, you should have received a copy of our earnings release and the earnings presentation. If you've not received both documents, they're available on our investor website intc.com.

The earnings presentation is also available in the webcast window for those joining us online.

I'm joined today by our CEO, Pat Gelsinger; and our CFO, George Davis. In a moment, we'll hear brief remarks from both followed by Q&A. Before we begin, let me remind everyone that today's discussion contains forward-looking statements based on the environment as we currently see it and as such, it does include risks and uncertainties.

Please refer to our press release for more information on the specific risk factors that could cause actual results to differ materially. A brief reminder that this quarter we have provided both GAAP and non-GAAP financial measures. Today, we will be speaking to the non-GAAP financial measures when describing our consolidated results. The earnings presentation and earnings release available on intc.com include the full GAAP and non-GAAP reconciliations.

With that, let me hand it over to Pat.

Patrick Gelsinger {BIO 1740128 <GO>}

Thank you, Tony. Good afternoon, everyone. Thanks for joining our second quarter earnings call. It's a thrilling time for both the semiconductor industry and for Intel. We're seeing unprecedented demand as the digitization of everything is accelerated by the superpowers of AI, pervasive connectivity, cloud edge infrastructure, and increasingly ubiquitous compute. Our breadth and depth of software, silicon, and platforms and packaging and process combined with our at-scale manufacturing uniquely positions Intel to capitalize on this vast growth opportunity.

Our Q2 results which exceeded our top and bottom line expectations reflect the strength of the industry, the demand for our products, as well as the superb execution of our factory network. As I've said before, we are only in the early innings of what is likely to be a decade of sustained growth across the industry. Our momentum is building as we once again beat expectations and raise our full year revenue and EPS guidance.

This laying out our IDM 2.0 strategy in March, we feel increasingly confident that we're moving the company forward toward our goal of delivering leadership products in every category in which we compete. While we have work to do, we are making strides to renew our execution machine. 7 nanometers is progressing very well. We've launched new innovative products, established Intel Foundry Services and made operational and organizational changes to lay the foundation needed to win in the next phase of our company's great history. Here at Intel, we're proud of our past, pragmatic about the work ahead, but most importantly, confident in our future.

Now, let me share some more detail on what we're seeing in the market. As computer is becoming more ubiquitous, we're seeing sustained strength and client demand. The ecosystem is back to shipping over 1 million PC units a day, despite grappling with component shortages. I expect PC TAM growth will continue in 2022 and beyond driven by three factors. First, PC density or PCs per household is increasing as COVID has irreversibly changed the way we work, learn, connect and care for each other. For example, even as we emerge from COVID, we're seeing many companies opt for hybrid work models versus full return to the office. Second, replacement cycles are shortening on a larger and aging installed base, the shift to notebooks, the deployment of new operating systems and new better experiences such as our Evo platform will continue to drive refresh on the 400 million PCs over four years old that are running Windows 10.

Finally, new markets and users are adopting the PC as the device of choice and penetration rates are increasing as worldwide GDP growth makes the PC more affordable to more people. In areas like education, we see huge potential as the number of PCs per hundred students and teachers remains in the single digits. These trends underpin my belief that we are still in the early stages of a sustainable cycle of PC growth and our OEM and channel partners have resoundingly affirmed this perspective. Young client, we are seeing near-term recovery across traditional data center market, as well as explosive long-term demand from the Cloud to the Intelligent Edge. Our digital society is creating data at an unspeakable pace, and AI is the key unlocking the value from this data and turning it into information.

As the appetite for meaningful data grows and the cost of compute falls, AI workloads are proliferating into more areas. And as a result, we expect the AI markets to grow at more than 20% a year. This is why we are infusing AI across everything we do. Similar revolutions are occurring in the areas of connectivity where the data center will be transformed by silicon photonics in 5G, which is hitting its stride with open RAN [ph] and an autonomous driving, all markets in which we have substantial leadership positions.

On the other side of the equation, the strong demand environment continues to stress the supply chain. While I expect the shortages to bottom out in the second half, it will take another one to two years before the industry is able to completely catch up with demand. IDM 2.0, which combines our internal manufacturing capacity with the use of third-party foundries, best positions us to weather these challenges and work with our ecosystem partners to build a more resilient supply chain.

With major fab construction projects underway in Oregon, Arizona, Ireland and Israel, we are investing for the future. But we are also taking action today to find innovative ways to help mitigate industry constraints. For example, on our Q1 call, I talked about using our internal assembly test network to help with portions of the substrate manufacturing process, a benefit uniquely enabled by our IDM 2.0 strategy. I am pleased to say that this effort is now online and is significantly accelerating the availability of millions of substrates for our products.

We are also working to build the EUV ecosystem, which require significant support around the equipment including photoresists, mass generation, and metrology. The great example is IMS Nano fabrication, a wholly owned subsidiary of Intel. Using a novel multi-beam technology, IMS provides the large majority of EUV (inaudible) providing tools to the industry, and we plan to accelerate investments to advance this pivotal ecosystem capability.

In the second quarter, we continue to see Intel Foundry Services build momentum. We are now engaged with more than 100 potential customers on the basis of our three key value propositions. First, IFS have the widest offering of IP ranging from x86 to Arm to RISC-V, which allows our customers the flexibility to design products, using our IP catalog as well as their own.

Second, we will offer our customers comprehensive access to a range of mature and leading-edge process and packaging capabilities. I am pleased to announce we recently signed our first major cloud customer to use IFS packaging solutions. I'll have even more good news to share on IFS customer momentum on Monday.

Third, IFS will offer scale manufacturing that gives our customers confidence we can meet their demand. As part of that, we are committed to creating a more robust, geographically balanced and secure supply chain. Along with our $20 billion fab investment in Arizona and $3.5 billion advanced packaging investment in New Mexico, we plan to build additional capacity to support both internal and IFS growth. The U.S. Innovation and Competition Act is a tremendous step forward to catalyze investments in manufacturing here in the U.S., and will serve as a tailwind to our IFS efforts. After my recent visit to Europe, we are seeing similar enthusiasm from EU governments, customers, and overall ecosystem. And we expect to announce our plans for our next U.S. and European sites by the end of this year.

Moving to our continued focus on execution. As I said at the start of the call, we are pragmatic about the work in front of us, but supremely confident of our future. Under IDM 2.0, our factory network continues to deliver and we are now manufacturing more 10-nanometer wafers than 14-nanometer. As 10-nanometer volumes ramp, economics are improving with 10-nanometer wafer cost 45% lower year-over-year with more to come. We will talk more about our plans for process and packaging leadership in our Intel Accelerated event this Monday. I hope you will join me for the critical update.

On our path back to unquestioned product leadership, customers continue to choose Intel. Using our broad portfolio of assets, we will continue to compete aggressively for market segment share. In Q1, we gained PC share with record notebook sales following that with record Q2 revenue. We launched 12 new processors and Tiger Lake is ramping even better than expected with more than 50 million units shipped to date. Finally, our future client roadmap remain strong and we expect to ship several million units of Alder Lake to customers in the second half and Meteor Lake remains on track for production in 2023.

Beyond the CPU, we reached a major milestone with our partners at Microsoft with the announcement of Windows 11. We deepened our co-engineering efforts to enable new experiences, including running Android application seamlessly on PCs and optimize for Intel-based platforms.

We're gaining similar momentum through the year in the data center. Q1 was the low point in revenue for the year and we exceeded our plan in Q2. We expect DCG to grow sequentially, achieving double-digit year-on-year growth in the second half. As it accelerates through the year, Ice Lake is ramping broadly to customers, including Microsoft, Alibaba, Baidu, Oracle and other major service providers and enterprise customers. Additionally, we continue to extend our leadership and networking by delivering a truly cloud agnostic platform using Xeon scalable processors and accelerators and partnership with Ericsson. This will allow operators like Verizon to introduce a virtualized RAN [ph] solution across all deployment scenarios, including existing footprints.

Finally, Mobileye further solidified its position as the leading supplier of advanced driver assistance platforms. In Q2, we announced a major win with Toyota and closed 10 additional design wins for over 16 million total lifetime units. Earlier this week, we hit another exciting milestone as Mobileye became the first industry player to start testing autonomous vehicles in New York City, a challenging driving environment for humans, let alone AVs. With vehicles in Israel, Germany, Detroit, Tokyo Shanghai and coming soon to Paris, Mobileye has the largest global footprint in the AV industry enabled by our unique REM distributed mapping technology. By year end, we will have over 1 million vehicles, providing telemetry for dynamic crowd-sourced mapping, a unique and powerful advantage of Mobileye.

At Intel, we have a saying, we begin with sand and the rest is our people. At no other point in our history, have our people and culture been more important to our success. We've recently made strategic organizational changes to further strengthen our technology leadership and accelerate our execution. We have restructured our data platform group into two business units. The data center and AI group led by Sandra Rivera, an Intel veteran with deep knowledge of data centers, silicon and software, and the Network and Edge Group which will be led by Nick McKeown, a renowned leader in the networking industry. We have also created the accelerated computing systems and graphics group led by Raja Koduri to increase the company's focus in key growth areas of high performance computing and graphics. We are also highly encouraged to have Shlomit Weiss rejoin to strengthen our design engineering core. Finally, Greg Lavender who joins as Intel CTO and GM of our Software and Advanced Technology Group will drive a unified vision for our software strategy across Intel and ensure it remains a competitive differentiator for us.

I have the utmost confidence in our leadership team to drive the future of Intel. Together, we will continue to sharpen our focus and execution, accelerate innovation and unleash the talent inside Intel. While there is more work ahead, we are moving at a torrid pace and I look forward to providing several updates in the coming months. On Monday, I invite you to attend Intel Accelerated or we will lay out our roadmap to regain process performance leadership and share what comes next for our world-class packaging technologies. In October, we will hold our Intel Innovation event, a geek fest for the industry to come together and explore the technology that will drive the next decade and beyond.

Finally, at our Investor Day on November 18th, we'll pull it all together and present a compelling long-term business plan to drive sustained growth and shareholder value creation. As you can see, we have a lot planned for the rest of the year. But for now, I'll turn it over to George to discuss our Q2 performance and outlook.

George S. Davis {BIO 3925391 <GO>}

Thanks, Pat. And good afternoon, everyone. As Pat said, we had a very strong Q2 and are raising full-year revenue guidance by $1 billion, despite a highly constrained supply environment. Q2 revenue was $18.5 billion, exceeding our guidance by $700 million. This upside was led by continued strength in our PC business and earlier than expected recovery in both our IOTG business and the enterprise portion of the data center segment. The PC and Mobileye businesses, both achieved record Q2 revenue. Gross margin for the quarter was 59.2%, exceeding guide by 220 basis points, primarily due to improved mix and strong flow through on higher revenue. Q2 EPS was $1.28, up $0.23 versus guide largely on strong operational performance across the board. In Q2, we generated $8.7 billion of cash from operations, free cash flow of $5.1 billion and paid dividends of $1.4 billion.

Moving to segment performance in the quarter. CCG revenue was $10.1 billion, up 6% year-over-year. The growth of our core client business is up 14% when we exclude the impact of the ramping down Apple modem business and the exit of our Home Gateway business. This shows the strong underlying growth in our client business, despite a supply constraint environment.

Platform ASPs (inaudible) were up 4% sequentially on richer mix within notebook and increased desktop volume. On a year-over-year basis, the strength in consumer entry in education led to lower overall ASPs. Operating income was $3.8 billion, up 32% year-over-year on higher revenue, lower inventory reserves and reduced 10-nanometer costs. DCG revenue was $6.5 billion, exceeding our expectations, but down 9% year-over-year versus a challenging compare and a continued competitive environment. Sequentially, DCG grew 16% with all segments growing quarter-over-quarter and enterprise returning to year-over-year growth.

Operating income was $1.9 billion, down 37% year-over-year primarily on lower revenue, the 10-nanometer production ramp and increased R&D investment. IOTG revenue was $984 million, up 47% year-over-year on a broad-based recovery from COVID driven lows and up 8% quarter-over-quarter led by strength in the retail segment.

Operating margin was $287 million, up 310% year-over-year, returning to pre-COVID levels of profitability. Mobileye revenue was $327 million, up 124% year-over-year, but down sequentially due to COVID-related slowdowns at automotive OEMs.Operating margin was $109 million. Mobileye continues to execute extremely well, and we are seeing continued design win momentum. PSG revenue was $486 million, down 3% year-over-year due to significant supply constraint. Demand continues to significantly exceed supply for FPGAs. Operating margin was $82 million, up 3% year-over-year.

Moving to our Q3 and full-year outlook. For Q3, we are guiding revenue of $18.2 billion, up 5.4% year-over-year. We remain in a highly constrained environment where we are unable to fully supply customer demand. In CCG, we continue to see very strong demand for our client products and expect TAM growth to continue. However, persistent industry-wide component and substrate shortages are expected to lower CCG revenue sequentially. We expect supply shortages to continue for several quarters, but appear to be particularly acute for clients in Q3. And data center, we expect enterprise and government and cloud to show further recovery in Q3. As a result, we expect to see expect to see strong year-over-year growth in the quarter. Sequentially, we are expecting modest growth that is expected to accelerate further in Q4. Gross margin is expected to be approximately 55%, down approximately 150 basis points year-over-year as 7-nanometer gains momentum and the Meteor Lake pilot line ramps. We're also seeing pre-PRQ reserves on our Alder Lake product.

We are forecasting EPS of $1.10 per share and a tax rate of approximately 4%. The forecast includes approximately $0.10 of one-time tax benefit from our on-shoring of certain entities as part of our long-term tax planning.

Turning to our full-year outlook. We are raising our revenue guidance by $1 billion to $73.5 billion with gross margin of 56.5% and EPS of $4.80, up $0.20 from our prior guide. Consistent with the investment mode we are in under IDM 2.0, we expect CapEx of $19 billion to $20 billion this year and free cash flow to be $11 billion, up $500 million versus prior expectation. In our CCG business, we expect full year revenue to be flat to slightly down year-over-year as growth from an increasing TAM is offset by supply constraint and the ramp down of our Apple modem and CPU revenue and the exit of our home gateway business. Adjusting for all of the Apple and home gateway business, CCG would have been up high single digits year-over-year. For DCG, we expect full year revenue to be slightly down year-over-year with second-half revenue significantly higher than first half as Eng and Cloud recovers. As a result, we expect data center will return to year-over-year growth in both Q3 and Q4.

Gross margin percent is expected to be lower in the second half of the year predominantly due to 7-nanometer factory ramp, worsening supply constraints impacting client volume and mix and a one-time charge in Q4 related to our Intel Federal business. For your models absent this one-time charge, implied Q4 gross margin would be approximately flat to Q3. It is good to remember that our investment in 7-nanometer represents a normal impact prior to introducing new process technologies. Since April, we have seen supply chain inflation happening faster than we are electing to pass through to our customers, further impacting our second half gross margin outlook. We expect increased R&D through the year as we invest in our roadmap and IDM 2.0 strategy, resulting in year-over-year growth in OpEx of approximately 10%.

With that, let me turn it back over to Tony and get to your questions.

Tony Balow {BIO 21936645 <GO>}

All right. Thank you, George. Moving on now to the Q&A. As is our normal practice, we would ask each participant to ask just one question. Operator, please go ahead and introduce the first caller.

Questions And Answers

Operator

(Question And Answer)

Certainly, our first question comes from the line of Tim Arcuri from UBS. Your question, please.

Q - Timothy Arcuri {BIO 3824613 <GO>}

Hi, thanks. Pat, there was some headlines recently about you potentially looking at maybe, building out your family business by M&A. And I'm wondering, can you just comment broadly, do you think that M&A would significantly accelerate your foundry efforts? I know right now; you're basically offering that 22 nanometer process and you probably have to offer more processes to sort of pull those efforts forward. So, I'm wondering if you can comment on the headlines that were out there. Thanks.

A - Patrick Gelsinger {BIO 1740128 <GO>}

Thanks for the question Tim, and great to be with you all today. So first, I'd say, obviously, we can't comment specifically on the speculation that you've been hearing. But what I want to say is we are very happy with the build out of the IFS business. As you say, it will include mature nodes or 22 FFL, we'll also include our leading-edge nodes as well our packaging offerings. And overall, we're just seeing great momentum over 100 customers in our pipeline and we fully expect that this is going to be a great business for us. At this point, we would not say that M&A is critical, but nor would we rule it out.

Our view is that industry consolidation is very likely, the intense R&D, the need to move to modern and leading-edge nodes. The massive capital investments required. We just simply view that smaller player simply won't be able to keep up and foundries without leading-edge capabilities will be left behind. And we're continually seeking ways to accelerate our plans with IFS. If an acquisition can help, we will certainly not rule it out. Thank you.

Operator

Thank you. Our next question comes from the line of C.J. Muse from Evercore ISI. Your question, please.

Q - C.J. Muse

Yes. Good afternoon. Thank you for taking the question. Just wanted to clarify, George. The one-time charge in Q4 roughly, $300 million. Can you give a little more color on that and then I guess Pat or George, a bigger picture question as you're going through this transformation IDM 2.0 strategy, is there a free cash flow target that you have in your mind in the coming one or two years, or no? Thank you.

A - George S. Davis {BIO 3925391 <GO>}

Yes. Let me, I'll start with the one-time charge. Without going into too much detail, it is related to our high-performance compute activities through our Intel federal. It's crystallizing Q4 at the time that we execute a contract. So that's the reason for the timing.

A - Patrick Gelsinger {BIO 1740128 <GO>}

Yes. And I would just say the HPC business for us consistent with the reorg that we just announced C.J. We just see a huge opportunity for us as we start delivering our CPU, HPC, specialized versions of the Xeon product, we see a great opportunity. The reorg brings more focus on this business. So, even though there's the one-time charge in Q4. We see this is a great business for us for the long term and one that just will bring many, many technological market and business benefits. So George, I'll let you answer the second half.

A - George S. Davis {BIO 3925391 <GO>}

The -- in terms of free cash flow, obviously, very important, we're focused on that, we raised it this year as you saw on the call. We will go through not only free cash flow, but capital and all of the normal financial -- key financial metrics for the company at the November Analyst Meeting. So, we'll defer until that time on that question, but thanks.

Operator

Thank you. Our next question comes from the line of John Pitzer from Credit Suisse. Your question, please.

Q - John Pitzer {BIO 1541792 <GO>}

Yes. Good afternoon, guys. Thanks for letting me ask the question. Pat, I wanted to ask a bigger picture question just on pricing in the quarter and your philosophy around pricing. It sounds like within the client business, mix explains a lot of the decline in ASPs year-over-year. But when I look at the data center group, especially with enterprise up and comms down year-over-year, I was a little bit surprised to see ASP in that group down about 7% year-over-year. Can you help us understand what's mix versus like-for-like and as you think about regaining product dominance? How do you use pricing to kind of maintain a share as you get sort of your feedback underneath you?

A - Patrick Gelsinger {BIO 1740128 <GO>}

Yes. And broadly speaking, my comments will be a little bit specific to start with on the data center business proper. Data center business, good recovery in Q2. And with that, there was some ASP declined some of that's competitive driven, a little bit of that is mixed driven, but a bit more competitive. Our outlook there is that we see fairly stable pricing and market segment share in the data center business for the second half of the year, and that's driven by driven by, I'll just say, we are bringing everything we got to the table to continue to win back the market. And with that, our software resources are deep investments with our customers, the increasing strength of our product line.

So, I'd also highlight they have a very strong ramp for the Ice Lake product, which is very competitive. Clear leadership on a number of metrics, the critical ones such as AI performance. And we're also starting to see the return to growth in cloud as you know with stronger growth in the enterprise, a portion of the market. So overall, DCG good growth second half over first half. We'll be very competitive with that business, but it's a supply constrained environment overall, which is the similar case for the client business.

So overall, we don't see a lot of movement on ASP first half or second half, and either of those businesses that really is about supply limitations. And as George commented, we're not passing through all of our supply constraint price increases that we're seeing from our supply chain. We really see it as an opportunity to be investing with our customers rebuilding their confidence and partnership for the future, and we're feeling very good about our overall strength momentum and competitiveness as we go into the second half.

A - George S. Davis {BIO 3925391 <GO>}

And I would just add the Q2 number, which looks like a double-digit ASP decrease for CCG. I would just remind you that that's a year-over-year comparison, where we have a much bigger mix of the small core products, which is really, driving that you saw units were up 33% and ASPs were down 15%. It's really the mix that is reflected there.

Q - John Pitzer {BIO 1541792 <GO>}

Thank you.

Operator

Thank you. Our next question next question comes from the line of Stacy Rasgon from Bernstein Research. Your question, please.

Q - Stacy Rasgon {BIO 16423886 <GO>}

Hi guys, thanks for taking my question. I have a question on depreciation. It's been coming down sequence for the last several quarters. It was actually down again, sequentially this quarter. How is that possible, given the CapEx ramp like what's going on there? And how do we think about depreciations impact and gross margin going forward? Given it sort of run rating under $10 billion annually, in your CapEx is now going to $20 billion annually like how do I think about those?

A - George S. Davis {BIO 3925391 <GO>}

Yes, Stacy. So, the absolute numbers are down or trending, what sort of counterintuitively and really, it's NAND moving from non-GAAP into GAAP. There's no depreciation for the NAND business anymore. As it's under the accounting once it's held for sale. So, it's an anomaly. Yes. We expect depreciation to increase as we're ramping CapEx over the next several years. And again, in terms of how all of that translates into everything from gross margins to free cashflow will cover all that at the Analyst Day, but you're not missing anything.

Q - Stacy Rasgon {BIO 16423886 <GO>}

Got it. Thank you.

A - George S. Davis {BIO 3925391 <GO>}

You bet.

Operator

Thank you. Our next question comes from the line of Joe Moore from Morgan Stanley. Your question please.

A - Joseph Moore {BIO 17644779 <GO>}

Great. Thank you. I'm wondering if you could address the timing on Sapphire Rapids, there was some stuff on your blog kind of in the June that there was a delay, it doesn't sound like some customers. There's been that much of a change, but just maybe, from your standpoint, how should we think about the timing of that product and how it affects you over the next 12 months?

A - Patrick Gelsinger {BIO 1740128 <GO>}

Yes. Thanks, Joe. I'll take that one. And overall, as I said, we have the data center business strong momentum and we really felt Q1 is the low point, Q2 gaining momentum, second half Ice Lake ramping very strong. And obviously, customers are now very anxious and excited about Sapphire Rapids, huge performance improvements, but also huge feature capabilities as part of that.

So, we did add a bit more time for the validation cycle for -- we are now deep into the validation. It's in the hands of customers with volume sampling underway and they're quite excited about not just the performance capabilities, core count increases, but a lot of the new technologies in the area of new memory capabilities, new PCI Gen 5 capabilities. There are many of the new features that we brought in here for AI performance in particular.

So overall, it's going to be a great product and we're expecting to see a very strong ramp of it in the first half of next year and this, we think we'll just continue to build the momentum of the data center business as we've indicated strong second half as forecast and we're going to build on that as we go to the next year with Sapphire Rapids. And the overall roadmap execution is improving as we look for 23 and 24 to deliver unquestioned leadership product across everything that we do including the data center.

A - Joseph Moore {BIO 17644779 <GO>}

Okay. Thank you.

Operator

Thank you. Our next question comes from the line of Vivek Arya from Bank of America. Your question, please.

Q - Vivek Arya {BIO 6781604 <GO>}

Thanks for taking my question. That one more on the foundry business. So, we have heard Intel commit, I think, 20 billion to the U.S. foundry over the next several years and another 20 billion to foundry operations in Europe. I'm curious when that spending is going to start and importantly, who are the target customers, because when I look at the fabulous landscape, it's not the cloud vendors, who are the large fabulous customers, right it's Apple, it's Qualcomm, it's NVIDIA, Marvell, AMD, et cetera and many of them compete against Intel. So, I'm curious, who are the target customers here that can justify this nearly $40 billion of spending that Intel is committing to from a family perspective. Thank you.

A - George S. Davis {BIO 3925391 <GO>}

Yes. Vivek, this is George. A couple of things; number one, we're short of supplies. So, we're the first big customer going into that expanded capacity and we'll open up those facilities getting the shells and what I would call the lower cost elements in place is something that quite frankly, we've fallen behind on over the last few years.

So, this is we're playing a little catch up just for our own requirement. Now, with foundry, we'll be talking about some potential customers. We've talked about 100 customers that are talking to us about foundry opportunities. Obviously, when you bring on a new foundry customer, there's -- as you look at the lead times that are needed for that, and the lead times that are needed to actually do the most expensive part of adding to your capacity. Those things actually line up pretty well. So, we'll manage that quite tightly. We'll go into this in more detail in November. But it's not a -- this is not intended to be a -- we'll just keep building and hoping that somebody shows up, it's going to be tied to the demand signals that we're receiving and that -- not only for us, which are significantly, in excess of our capacity today. But also for the customers we're working with, which I believe will be talking about more next week at our event.

A - Patrick Gelsinger {BIO 1740128 <GO>}

Yes. And just to add, Vivek, we'll cover some more of this on Monday, in our Intel accelerated event. And as part of that, we'll be laying out more specifics on the roadmap, the process, the packaging. But I'll say, to the core of your question was, who's going to be the customers for this? We expect a broad range of customers. We're going to have a range of offerings on the menu, if you could for modern nodes as well as leading edge nodes. We expect a range of customers across different segments of the marketplace, including some of the largest users of wafer capacity in the industry.

There's a lot of excitement in the marketplace, 100 plus customers in the pipeline already and you can expect to see great things in this area of a new and exciting business. The world needs more semiconductors. The world needs a more balanced geographic supply chain for those semiconductors and we're finding enormous momentum, and enthusiasm for that strong support from the customers, the ecosystem as well as the governments around the world.

Q - Vivek Arya {BIO 6781604 <GO>}

Thank you.

Operator

Thank you. Our next question comes from the line of Matt Ramsay from Cowen. Your question, please.

Q - Matt Ramsay {BIO 17978411 <GO>}

Good afternoon. Thank you very much. Pat, I was really pleased to see you guys announced that Greg was going to come join you as CTO, I don't know how many of the semiconductor folks are familiar with his background and maybe, you could just talk a little bit about what as CTO is going to be under Greg's remit. I know you guys have had this one API software strategy. For a while, that looks great and slides and on paper, but we've not seen a ton from it. So, if you can expand a little bit about what's exactly going to be under Greg's remit and what he's going to be charged with. That would be really helpful. Thanks.

A - Patrick Gelsinger {BIO 1740128 <GO>}

Yes. Thank you, Matt and Greg will be CTO, the company's a CTO. So, as part of that remit will be all of our labs, advanced research capabilities. We have a pool of hundreds of Ph.D.'s doing advanced research and some of the most leading-edge work is done and as you probably know about Greg as well. He was a UT professor and was my CTO at VMware. He will also be the leader of all of our central software activities and this is a large organization, it's a bios, drivers, compilers, all of those core things and the one API initiative, which we're now starting to see major partners come and align with us around one API. The third and maybe, most important area under his remit will be standardizing the upper layers of the software stack for us and in particular, the AI software offerings for us, and this is an area that we have, I'll say, not managed well. We've had too many pieces and different portions of the organization. So, he'll become the AI software leader at scale for us and an area that's going to be critical to standardize, deliver and just deliver some of the world's leading research that we have in the area of our software remit for our AI product offerings overall.

Super excited to have him on the team, a world-class technologist and software leader, combining with another world-class leader like Nick McKeown, a world-class leader like Shlomit Weiss coming back on the team for engineering. Talent flow was going out of the company. It is now coming back to the company and we are excited about the leadership team that we are forming.

Operator

Thank you. Our next question comes from the line of Harlan Sur from JPMorgan. Your question, please.

Q - Harlan Sur {BIO 6539622 <GO>}

Good afternoon. Thanks for taking my question. On your data center of business, good to see the sequential inflection in Q2. Looking into the second half and your guidance for Q3 and Q4, it looks like DCG is going to grow double digits percentage year-over-year in the second half. And then that would imply that your data center business is growing double-digit second half versus first half of this year is the mathematically correct and in addition to the cloud and hyperscale spending the acceleration and improving enterprise. Does the team continue to see strength and service provider, as well as your customers continue to build out there 5G networks?

A - Patrick Gelsinger {BIO 1740128 <GO>}

Yes, yes and yes. To your question, Marlin, right. And we're really the first half, second half year-over-year, you got it, right. We're seeing the growth for it. And like we said, yes. We saw the bottom in Q1. Great Q2 momentum continuing into the second half and next year, and we saw a strong growth in enterprise and government, recovery and cloud or we're seeing growth in that area. But as you say, as I say, we are so well positioned on the edge and the 5G, OpenRAN, vRAN initiatives in the industry are now hitting stride. And I think, I've only been on three major service provider calls this week on exactly that topic, right, where they're really starting to look at those deployments at scale for a standardized software-driven edge environment for their 5G networks.

And I'd also say, this is a victory for innovation just a year ago, we were very -- just three years ago, there was great geopolitical concerns around 5G and would there ever be flexibility for how that would get deployed nationally. Now, everybody is aligning against the ORAN and vRAN initiatives. It's the way to do their 5G broad deployments and the Intel platform sits in the center of those, almost everywhere in the world. It really is a great success story for us and one that we think that will be harvesting for many, many years to come.

Q - Harlan Sur {BIO 6539622 <GO>}

Thank you.

Operator

Thank you. Our next question comes from the line of Toshiya Hari from Goldman Sachs. Your question, please.

Q - Toshiya Hari {BIO 6770302 <GO>}

Good afternoon. Thanks so much for taking the question. I had a multi-part question on gross margin. George, you talked about PRQ reserves related to Alder Lake being a headwind this quarter. If you can quantify that for us ballpark, that would be super-helpful. And then toward the end of your remarks, in terms of the second half outlook, in terms of gross margin. You talked about supply tightness driving a deterioration in CCG mix, I was a little surprised to hear that given how strong Chromebooks were in the first half. So, if you can elaborate on that, that would be super helpful as well. Thank you.

A - George S. Davis {BIO 3925391 <GO>}

Yes. So, in terms of, if we're looking at the -- particularly, let's just look at Q3, because that's where we discussed all the -- elderly pre PRQ reserves. It's one of the two top movers when you look at being down 400 basis points. It's certainly not the -- it's not the majority, but it's a meaningful impact in the quarter. Seven nanometer startup costs ramping are -- is the biggest impact for a way.

In terms of supply tightness, the challenge is, a part of what made Q2 so great was customers really challenged our sales teams and our factories to remix within a quarter to provide them with the components that they could then match with what their supply chain was providing them. So, they could get to market and this was -- watching it was super-impressive, a little bit scary at times. But the team did a fantastic job.

So, we did a really good job of eating up a lot of our substrates, some of which we thought we would have available to us in Q3. So, you're -- the supply impact is more of a volume impact. Customers are already starting to mix upwards. So that's usually, a positive for gross margin. And if there's upside in the second half, it will come from both higher substrates and the ability, and a higher mix. And that could well be the case. We were cautious. Q3, we could see we had a real supply challenge. I mean, it's acute. But Q4, we're doing everything we can to help our substrate suppliers increase supply including finishing up some of their manufacturing in our own facilities, which is something we could do as an IDM. If we have more success than we can forecast today, maybe Q4 could be seen as conservative.

Q - Toshiya Hari {BIO 6770302 <GO>}

Thank you.

Operator

Thank you. Our next question comes from the line of Srini Pajjuri from SMBC Nikko. Your question, please.

Q - Srini Pajjuri {BIO 5862807 <GO>}

Thank you. Just a follow-up to the previous question, George. Could you give us some idea as we head into the next year, what are some of the puts and takes on the gross margin front? I'm just curious as to how long the 7-nanometre cost will persist and wend with the peak out, and as you go into first half of next year, how should we think about the gross margins?

A - George S. Davis {BIO 3925391 <GO>}

Yes. So, again I'll -- I'm going to defer any kind of forecasting of '22 and beyond. But as you know, the fact that we have the seven nanometer startup ramping is a good sign that we're getting close to being able to get products ramping and that's what really drives down costs overtime. I think Pat was talking about Q2-over-Q2 up 47% reduction in wafer cost and 10 nanometer. That's the kind of benefit you can get as you ramp into a process. So, we'll lay out more of our thinking in that regard later.

Q - Srini Pajjuri {BIO 5862807 <GO>}

Thank you.

Operator

Thank you. Our next question comes from the line of Tristan Gerra from Baird. Your question, please.

Q - Tristan Gerra {BIO 1843308 <GO>}

Hi. Good afternoon. Just a quick follow-up on the substrate commentary during the Q&A. Is this something that you believe can actually help you competitively as you substrate manufacturing in-house particularly, if supply constraints continue in the first half of next year?

A - Patrick Gelsinger {BIO 1740128 <GO>}

Yes. We do think it generally moderates market share movements in the industry period. And if anything we're able to use it as an advantage, because we're able to pull some of those substrate steps. Just to be clear, we're still relying on our substrate network. But we're pulling some of the back-end processing into our own factories, which allows us to essentially get more out of the capacity that's available in the industry and that's what's enabling us to, I'll say, continue to over achieve on the overall market share gains that we've been seeing. This has been an important factor. We do have some factored into our second half. We do hope to continue to overachieve in that area. And if I'd say, why do we overachieve so much in Q2. The heroes for the quarter for us, where our manufacturing and operations team. They just did a superb job for us and really, relying on them for the second half.

And as George said, hey, if there's more opportunity for us to overachieve on the guide that we set for the second half, it's going to come at the hands of their ability to essentially create more out of nothing, find capacity in the industry, build it out and we're doing quite well in this respect. But overall, it is a constrained environment and as a result, we and everybody else are trying to drive our factories harder, drive yields better and be able to improve the supply chain of the industry and we're quite excited about the enthusiasm we see in this consistent strong demand signal as the world becomes more digital. And we're going to be building our internal factories rapidly, our supply chains rapidly and working with our supply chain quite aggressively.

Q - Tristan Gerra {BIO 1843308 <GO>}

Great. Thank you.

Operator

Thank you. Our next question comes from the line of Ross Seymore from Deutsche Bank. Your question, please.

Q - Ross Seymore {BIO 20902787 <GO>}

Hey, guys. Thanks for letting me asking question. I wanted to turn to the profitability side of things and specifically, on DCG in the operating margin there. It's great to see that it improved from first quarter to second quarter and given the revenue trajectory, I would assume it would improve again, in the back half of the year, but kind of trough-to-trough 2018 digestion period to this most recent one. The operating margin is about 10 points lower, mid-20s roughly versus mid-30s prior. And I really wanted to understand why is it lower this time and perhaps even much more importantly.

Going forward, is there anything structurally, that is going to stop that from returning back to the 40% to 50% operating margin range you guys have historically driven, competitive dynamics, need to catch up. On the manufacturing sides, you have headwinds there, people customizing more cloud competition internally, any of those dynamics that would stop you from getting back to that range? Thanks.

A - Patrick Gelsinger {BIO 1740128 <GO>}

Yes, thanks. Maybe, starting at the latter part of your question. There's no long-term reason why you could not see DCG return to more historical margins. What you're seeing today is a reflection of a couple of things. First off, year-over-year, you've got significant factory startup costs embedded for them, which if you look at their operating margin, I would say another thing that people maybe, are overlooking is our OpEx investments. We have significantly increased the OpEx in key areas of the company even as we've taken down about $2 billion of OpEx since 2018 on various portfolio actions.

So -- and the DCG and the Xeon product line is absolutely critical to the company. And so we have substantially increased OpEx within that as well. So that's the second largest impact and we're going to continue to do that for as long as it's needed and as you know, ultimately, it is your product competitiveness that gives you more flexibility to drive up ASPs further from today and drive higher gross margins. But I think the early comparisons this year were just offer such a strong compare, I mean, in the first half of last year was just super strong high XCC count quarters. And in the first half of this year -- all those Q2 quite frankly quite frankly was a lot better than we thought coming into it for DCG, on strength and enterprise. But the comparisons year-over-year were quite tough.

As you noted, it's coming up and yes, seven nanometers start-ups got to be absorbed and higher OpEx. But I think as you see our product portfolio continue to get stronger and stronger with Ice Lake and Sapphire Rapids, and then for the generations after that. There's no reason why over time, we don't get back to historic levels. And I'd also just add one small point that the IFS gives us the opportunity to co-engineer with our largest customers and this in fact creates a unique competitive differentiation, where our IP with their IP is creating products that are very uniquely beneficial to their TCO and very co-engineered. So, very sticky for both of us. And the example, customer that we said of a very large cloud customers. One of our IFS early customers is an example of that kind of co-engineering that we expect that we'll be doing at scale for that portion of the marketplace, pretty uniquely.

Q - Ross Seymore {BIO 20902787 <GO>}

Thank you.

Operator

Thank you. Our next question comes from the line of Ambrish Srivastava from BMO Capital Markets. Your question please.

Q - Ambrish Srivastava {BIO 4109276 <GO>}

Hi. Thank you, Pat. I just wanted to get back to the competitive environment and just trying to connect all the dots. So, in your slide deck for second quarter, you said that the ASPs are down and you referred to an increasingly competitive environment that servers. But in response to one of the questions earlier on, you said you expect a more stable share and pricing environment in DCG. And then the final thing that caught my attention was on the substrate side, you said, you're kind of leveraging that backhand to moderate market share. So, is that true for the -- did I get that correct that the environment -- competitive environment will be table versus what it was in the second quarter? And then it's the substrate also enabling your captive footprint in the backhand is allowing you to probably, stabilize share losses in the data center side as well. Thank you.

A - Patrick Gelsinger {BIO 1740128 <GO>}

The comment on fairly stable market segment share and ASP for DCG for the second half of the year is what our expectations are. So, I'll just say I think that the substrate and the overall supply limitations keeps, I'll say abound on market share movements in that area of the business overall. We do think incrementally our IDM capabilities give us a bit more capacity and we saw a market share gains for instance in the first half of the year and the client business as a result of that.

And we do think that gives us some ability to hopefully, do a bit better than we've even guided with if it occurs. But overall, yes, your questions in the right domain; fairly stable, ASPs; fairly stable market segment share in the data center in the second half of the year, which as we've already said, is substantially improved from last year as well as from the first half of this year. Products are getting more competitive. Stronger products give us more ASP capabilities as they become more competitive. So overall, we're feeling like the bottom was Q1, Q2 showed that to be the case even a bit above our expectations and we're in a great trajectory for the second half and into next year.

Q - Ambrish Srivastava {BIO 4109276 <GO>}

Thank you.

A - Patrick Gelsinger {BIO 1740128 <GO>}

Thank you. Well, I think we'll wrap up at this point. Before we sign off, one last opportunity to say what it is, an honor to be back for my dream job to run this iconic company at this pivotal time in the history of the semiconductor industry. We're rebuilding our heritage of execution, innovation and growth along with the 110,000 talented passionate Intel employees. I am just absolutely confident that the best days for this company are ahead of us. Thanks for the call today and I do look forward to talking to you all at our Intel accelerated events on Monday. Talk to you then. Thank you so much.

A - Tony Balow {BIO 21936645 <GO>}

Thanks, Pat. Thank you all for joining today. Operator, can you please close the call?

Operator

Certainly, thank you. And thank you, ladies and gentlemen, for your participation in today's conference. This does conclude the program. You may now disconnect. Good day.