And this happens 50,000 times every second, of every minute, of every hour, of every day…month…year….
Forward looking statements

This document contains statements relating to certain projections, business trends and other matters that are forward-looking, including statements with respect to expected trends and outlook, bookings, expected financial results and trends, including expected sales, EUV and DUV revenue, gross margin, R&D and SG&A expenses, and target effective annualized tax rate for the first quarter of 2019, and expected financial results and trends for the full year 2019, including the expectation for continued growth in sales in 2019, with a stronger second half versus the first half, annual revenue opportunity in 2020 and growth potential through 2025, sales and profit targets for 2020, trends in DUV systems revenue and Holistic Lithography and installed based management revenues, expected industry trends and expected trends in the business environment, including continued solid demand for shipments to China, expectations with respect to margins in 2019, including the expected recovery to historic levels by year end statements with respect to the commitment of customers to insert EUV into volume manufacturing by ordering systems, statements with respect to roadmap acceleration, including the introduction of higher productivity systems in 2019 (including the expected shipment of NXE:3400C and expected timing thereof) and the expected benefits, statements with respect to the logic segment expected to be a growth driver, including its expected investment in technology transitions and production capacity for advanced nodes, ASML’s commitment to volume manufacturing and secure system performance, shipments, and support for volume manufacturing, including availability, progress supporting EUV ramp and improving consistency, productivity, and production and service capability enabling required volume as planned, including expected shipments (including expected EUV shipments in 2019 and expected availability of chips produced by EUV scanners to customers in 2019), statements with respect to the expected benefits of the introduction of the new DUV system and expected demand for such system, the expected benefits of the introduction of technologies from ASML’s Brion and HMI product groups, the expected benefits of the new options for the TWINSWISS XT:860M KrF scanner and of the Advanced Wafer Clamping System (AWACS), the expected negative impact of the fire at one of ASML’s suppliers on sales, including the expected recovery timeline, shrink being a key industry driver supporting innovation and providing long-term industry growth, technology innovation driving growth in the next years, Holistic Lithography enabling affordable shrink and delivering value to customers, DUV, EUV and Application products providing unique value drivers for ASML and its customers, the expected continuation of Moore’s law and that EUV will continue to enable Moore’s law and drive long term value for ASML well into the next decade, the intent to continue to return excess cash to shareholders through growing dividends and regularly timed share buybacks in line with ASML’s policy, statements with respect to the proposed dividend for the 2019 Annual General Meeting Shareholders and the share repurchase plan for 2018-2019, including the intention to use certain shares to cover employee share plans and cancel the rest of the shares upon repurchase, and statements with respect to the expected impact of accounting standards. You can generally identify these statements by the use of words like “may”, “will”, “could”, “should”, “project”, “believe”, “anticipate”, “expect”, “plan”, “estimate”, “forecast”, “potential”, “intend”, “continue”, “targets”, “commits to secure” and variations of these words or comparable words. These statements are not historical facts, but rather are based on current expectations, estimates, assumptions and projections about the business and our future financial results and readers should not place undue reliance on them.

Forward-looking statements do not guarantee future performance and involve risks and uncertainties. These risks and uncertainties include, without limitation, economic conditions, product demand and semiconductor equipment industry capacity, worldwide demand and manufacturing capacity utilization for semiconductors, including the impact of general economic conditions on consumer confidence and demand for our customers’ products, competitive products and pricing, the impact of any manufacturing efficiencies and capacity constraints, performance of our systems, the continuing success of the related pace of new product development and customer acceptance of and demand for new products including EUV and DUV, the number and timing of EUV and DUV systems shipped and recognized in revenue, timing of EUV orders and the risk of order cancellation or push out, EUV production capacity, delays in EUV systems production and development and volume production, including meeting development requirements for volume production, demand for EUV systems being sufficient to result in utilization of EUV facilities in which ASML has made significant investments, potential inability to recover as planned or at all from the negative sales impact of the fire at one of our suppliers, potential inability to successfully integrate acquired businesses to create value for our customers, our ability to enforce patents and protect intellectual property rights, the outcome of intellectual property litigation, availability of raw materials, critical manufacturing equipment and qualified employees, trade environment, changes in exchange rates, changes in tax rates, available cash and liquidity, our ability to refinance our indebtedness, distributable reserves for dividend payments and share repurchases, results of the share repurchase plan and other risks indicated in the risk factors included in ASML’s Annual Report on Form 20-F and other filings with the US Securities and Exchange Commission. These forward-looking statements are made only as of the date of this document. We do not undertake to update or revise the forward-looking statements, whether as a result of new information, future events or otherwise.
Employees, R&D and manufacturing locations

Offices in more than 60 cities in 16 countries

Global headquarters
Veldhoven, the Netherlands

12,704

Veldhoven
Netherlands

5,396

Pyeongtaek
Korea

5,155

San Jose
US

Wilton
US

R&D and manufacturing locations
the Netherlands, the United States, China, Taiwan, Korea

San Diego
US

Linkou & Tainan
Taiwan

Shenzhen
China

Beijing
China
ASML enables Moore’s law by providing lithography equipment to produce smaller and more powerful chips

The Semiconductor Manufacturing Process

A variety of complementary suppliers provide the other tools, materials and packaging equipment necessary to make ICs
A chip up close

- Hair: 50,000nm
  Growth: 8nm/sec
- Red bloodcell: 7,500nm
- Bacteria: 800 to 1,000nm
- Gras growth: 33nm/sec
- Common cold virus: 30nm
Moore’s Law is a law of economics

- Imagine printing the book *The Hitchhiker’s Guide To The Galaxy* (by the late great Douglas Adams)
- That’s 227 pages at font size 14
- Now shrink all text to font size 7 and observe Moore’s Law at work

- You’ve halved the cost to print the book
- You’ve halved the time to print the book
- You’ve doubled the information density of the book
ASML enables Logic process evolution

<table>
<thead>
<tr>
<th>Year</th>
<th>iPhone Model</th>
<th>Process Node</th>
<th>GPU Cores</th>
<th>CPU Cores</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>iPhone 3G</td>
<td>90nm</td>
<td>1</td>
<td>1</td>
<td>412 MHz</td>
</tr>
<tr>
<td>2009</td>
<td>iPhone 3G</td>
<td>65nm</td>
<td>1</td>
<td>1</td>
<td>412 MHz</td>
</tr>
<tr>
<td>2010</td>
<td>iPhone 4</td>
<td>45nm</td>
<td>1</td>
<td>1</td>
<td>0.8 GHz</td>
</tr>
<tr>
<td>2011</td>
<td>iPhone 4S</td>
<td>32nm</td>
<td>2</td>
<td>2</td>
<td>1.2 GHz</td>
</tr>
<tr>
<td>2012</td>
<td>iPhone 5</td>
<td>28nm</td>
<td>2</td>
<td>2</td>
<td>1.3 GHz</td>
</tr>
<tr>
<td>2013</td>
<td>iPhone 5S</td>
<td>20nm</td>
<td>2</td>
<td>2</td>
<td>1.4 GHz</td>
</tr>
<tr>
<td>2014</td>
<td>iPhone 6(+)</td>
<td>14/16nm</td>
<td>2</td>
<td>2</td>
<td>2.37 GHz</td>
</tr>
<tr>
<td>2015</td>
<td>iPhone 6S(+)</td>
<td>16nm+</td>
<td>2</td>
<td>4</td>
<td>2.4 GHz</td>
</tr>
<tr>
<td>2016</td>
<td>iPhone 7 (+)</td>
<td>10nm</td>
<td>2</td>
<td>4</td>
<td>2.4 GHz</td>
</tr>
<tr>
<td>2017</td>
<td>iPhone 8,8+,X</td>
<td>7nm</td>
<td>2</td>
<td>4</td>
<td>2.5 GHz</td>
</tr>
<tr>
<td>2018</td>
<td>iPhone XS,XR</td>
<td>7nm</td>
<td>2</td>
<td>6</td>
<td>2.5 GHz</td>
</tr>
</tbody>
</table>

Source: ASML Market Research
Immersive devices will be the next computing wave

- **Smartphone + apps era**
  - Millions of units
  - 1995 to 2017

- **PC + browser era**
  - Millions of units
  - 1995 to 2017

---

**‘Immersive era’**

- **Drivers**
  - Resolution
  - Frame rate
  - Color accuracy
  - Contrast/brightness

- **Broad applications**
  - Entertainment
  - Gaming
  - Medicine
  - Visualization
  - Journalism
  - Education

Source: Lisa Su, AMD, "Immersive era in consumer computing", IEDM, Dec. 2017
The revolution in automotive

Autonomous and connected cars drive double digit growth to 80 B$ by 2025

Source: NVIDIA Corporate Presentation 2018
Artificial Intelligence (AI) as a major industry disruptor will represent a >15B$ new revenue opportunity in semiconductors by 2022

Source: Gartner
5G connectivity speed and latency improvement drives applications with more volume and real-time use.

- **3G**: 1 Gb/s/km², 100 ms latency
- **4G**: 10 Gb/s/km², 50 ms latency
- **5G**: >1,000,000 connections/km², 100-1000 Gb/s/km², 1 ms latency

Source: Several public sources
Advanced chips are needed to store and crunch data

1 ZB = 1000^7 bytes = 10^{21} bytes = 10000000000000000000000 bytes

Major trends in semiconductor-enabled computing

- Autonomous decisions
- Immersive resolution
- On-device Artificial Intelligence
- Virtual / augmented reality

- 5G connectivity
- Real-time latency
- Growing data volumes

- From big data to value
- Enhanced processing
- Deep learning

Moore’s Law

Applications

Performance

Cost

Data

Algorithms
Considerable motivation to continue Scaling/Shrinking

Moore’s Law is underpinning a business model

- **IC performance improvement at similar cost**
- **Improved electronic devices and new applications**
- Part of the profits are reinvested in R&D, equipment
- Consumers and businesses upgrade or adopt new products

**Takeaways**

Approx $350 billion of annual profit is riding on the industry’s ability to keep this cycle going

Approx $350+ billion of operating profit per year
ASML operates in an industry value chain that has considerable means with strong incentives to compete and drive innovation.

Top technology companies in our ecosystem (EBIT CY2017, B$)

<table>
<thead>
<tr>
<th>Applied Materials</th>
<th>ASML</th>
<th>LAM Research</th>
<th>KLA-Tencor</th>
<th>TEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3</td>
<td>2.8</td>
<td>2.6</td>
<td>1.4</td>
<td>2.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intel</th>
<th>TSMC</th>
<th>Samsung</th>
<th>SK hynix</th>
<th>NVIDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.7</td>
<td>18.0</td>
<td>47.6</td>
<td>12.2</td>
<td>3.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AMD</th>
<th>Broadcom</th>
<th>Micron</th>
<th>Qualcomm</th>
<th>NVIDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4</td>
<td>1.9</td>
<td>2.4</td>
<td>6.1</td>
<td>8.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cisco</th>
<th>Google / Alphabet</th>
<th>Microsoft</th>
<th>Oracle</th>
<th>Facebook</th>
<th>Amazon</th>
<th>eBay</th>
<th>Capital</th>
<th>Alibaba</th>
<th>Apple</th>
<th>Baidu</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.0</td>
<td>30.8</td>
<td>12.9</td>
<td>20.2</td>
<td>5.6</td>
<td>10.4</td>
<td>4.1</td>
<td>2.3</td>
<td>5.6</td>
<td>6.6</td>
<td></td>
</tr>
</tbody>
</table>

In our ecosystem, EBIT has grown at high single digit levels.

Source: Bloomberg (GICS 45 classification)
New semiconductor nodes drive investments in wafer capacity

- Growing wafer capacity drives increased litho demand
- New (leading edge) nodes with increased litho intensity further drives litho demand
- Conversion of existing nodes to new nodes also provide additional upgrade opportunity
- New process nodes will be two thirds of the 300mm wafer volume by 2025

Source: ASML analysis
Litho Intensity\(^1\) increasing for Logic and DRAM segments
With 3D XPoint expected to increase intensity for storage memory

EUV will likely be the enabler of <7nm logic, <1Y DRAM

\(^1\) Litho Intensity = Litho CapEx fraction of total WFE CapEx for Greenfield fab investment
Our strategy addresses opportunity

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>ASML Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Holistic Litho extension</td>
</tr>
<tr>
<td></td>
<td>DUV performance</td>
</tr>
<tr>
<td></td>
<td>EUV industrialization</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High NA</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Expand our Holistic Litho opportunities
- Remain competitive in DUV
- Bring EUV to high volume manufacturing
- Extend EUV technology beyond the next decade
To facilitate innovation, technology roadmaps are fully aligned with all key market players

- Industry long-term roadmaps need strategic partnerships to succeed
- ASML key enabler of EUV
- EUV roadmap on track for High Volume Manufacturing in 2018/2019

Source: ¹ Customers public statements, IC Knowledge LLC; ² ASML extrapolations
EUV: two accelerated development programs in parallel after having achieved volume production feasibility metrics

0.33 NA Summary
- ASML and supply chain preparing for planned production ramping
- Dedicated focus to improve availability across sites and systems
- Accelerated roadmap of NXE:3400C in order to deliver higher productivity tool, >170wph with improved availability
- Roadmap extended to the 3nm node working mix and match with DUV and High NA using common High NA and 0.33 NA innovations

High NA summary
- System design completed, module design progressing and key suppliers selected.
- Customers’ roadmap aligned with the High NA introduction plan starting at 3nm.
- Three customers have committed to 4 R&D systems and 8 options for early volume systems. Results in total up to 1.5 B€ Customer commitments
- Design of metrology system by joint ASML-Zeiss team and manufacturing of optics started.
- Extended collaboration with imec in support of necessary developments in ecosystem and demo access for customers
Our customers are not only talking about EUV
Building significant capacity for EUV systems

“Well here it is: EUV is officially a 30-year overnight success story. Congratulations to the thousands who worked so tirelessly to make it happen - especially to ASML who had the guts to follow through. Congratulations to Samsung for crossing the finish line first - a finish line that starts a whole new era for lithography. Condolences to all who predicted it would never happen.”

Dan Hutcheson, The Chip Insider® , October 19, 2018
TSMC invests 25B$ to move to 5nm, first production early 2020
7nm production has started on track

The chips built using the 7nm process technology are destined for AI, GPU, cryptocurrency, and 5G applications — totaling 50 chip designs by the end of 2018. For iPhones, the new 7nm process will pave the way for the type of performance improvements customers expect in new iPhones every year.

Orders for Apple's custom A12 processor for use in the upcoming iPhones will play a major driver of TSMC's 7nm chip production growth in 2018, according to market sources. The foundry has secured 7nm chip orders from about 20 customers including AMD, Bitmain, Nvidia and Qualcomm. The majority of the orders will be carried out in the first half of 2019, the sources said.

At the technology symposium, Wei also said that TSMC is scheduled to move a new 5nm node technology to mass production towards the end of 2019 or early 2020, with plans to Invest $25 billion into the technology.

In January, DigiTimes reported that Apple selected TSMC to remain the exclusive supplier of the upcoming A12 processor for its 2018 iPhones, following rumors from last summer that Samsung could be returning to iPhone chip production this year. TSMC is the exclusive supplier of the A11 Bionic processor found in the iPhone 8, 8 Plus, and X, as well as the sole supplier of the A10 Fusion processor in the iPhone 7 and 7 Plus.

Source: https://www.macrumors.com/2018/06/22/tsmc-ramps-up-7nm-chips/

ASML EUV Lithography value for our customer

- Process simplification and improved device performance
- 15 to 50% cost reduction compared to multi-patterning schemes
- 3 to 6x cycle time reduction compared to critical multi-patterning layers
- Best in class overlay performance and focus performance

EUV simplifies process complexity to enable our customers to drive cost effective patterning scaling beyond 7nm Logic and 16nm DRAM
In the same way 0.33NA enables 7nm Logic, 0.55NA EUV enables 3nm Logic

- Process simplification and improved device performance
- >> 50% cost reduction compared to multi-patterning schemes
- 3 to 6x cycle time reduction compared to multi-patterning for critical layers
- Best in class overlay performance and focus performance

We have received High NA commitment from 3 customers, for a total up to 12 systems
ASML’s Holistic Lithography roadmap maximizes patterning performance by optimizing Edge Placement Error (EPE).
Pattern Fidelity Control is next step in holistic lithography

Addition of E-Beam and Etch extends and improves the control paradigm

DUV and EUV Scanner Control

Scanner metrology (100% wafers)

After-Litho YieldStar Metrology

After-Litho E-beam Metrology

Etch Control

After-Etch YS & E-beam Metrology

Computational Lithography

Improved algos, models

Guide to areas of interest

Etch Suppliers

Scanner

Comp Litho

Optical Metro

E-Beam Metro

Etch
ASML total revenues grew at a CAGR of 12% since 2010

- **Systems revenue** grew at a 10% CAGR since 2010

- **Installed base management**
  - 20% CAGR since 2010 driven by holistic lithography, upgrades and growing installed base
  - Now approximately one quarter of our total revenue

- **Gross Margin trend** reflecting the strength of our DUV and Applications business and progress in EUV profitability
ASML’s capital allocation policy

Focused investment in our business through R&D, Capex and strategic M&A

Maintain a strong and flexible balance sheet

Distribute excess cash to shareholders through a combination of share buybacks and growing dividends
## ASML updated Financial Model (Investor-day 2018)

<table>
<thead>
<tr>
<th></th>
<th>2017 (Actual)</th>
<th>2018 (Guidance)</th>
<th>2020 (CMD 2016)</th>
<th>2020 (Scenario) (Moderate market)</th>
<th>2025 (Scenarios)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Sales</strong></td>
<td>9.1B€</td>
<td>~11B€</td>
<td>~11B€</td>
<td>~13B€</td>
<td>~15 - 24B€</td>
</tr>
<tr>
<td><strong>Gross margin %</strong></td>
<td>45.0%</td>
<td>~47%</td>
<td>&gt;50%</td>
<td>&gt;50%</td>
<td>&gt;&gt;50%</td>
</tr>
<tr>
<td><strong>R&amp;D % sales</strong></td>
<td>14%</td>
<td>~14%</td>
<td>~13%</td>
<td>~14%</td>
<td>~13%</td>
</tr>
<tr>
<td><strong>SG&amp;A % sales</strong></td>
<td>5%</td>
<td>~5%</td>
<td>~4%</td>
<td>~4%</td>
<td>~4%</td>
</tr>
<tr>
<td><strong>Capex % sales</strong></td>
<td>4%</td>
<td>~6%</td>
<td>~4%</td>
<td>~4%</td>
<td>~3%</td>
</tr>
<tr>
<td><strong>Cash Conversion Cycle</strong></td>
<td>224 days</td>
<td>~210 days</td>
<td>&lt;200 days</td>
<td>&lt;200 days</td>
<td>&lt;200 days</td>
</tr>
<tr>
<td><strong>Effective Tax Rate</strong></td>
<td>13%</td>
<td>~14%</td>
<td>~14%</td>
<td>~14%</td>
<td>~14%</td>
</tr>
</tbody>
</table>
Executive summary

- Healthy semiconductor **end market growth** driven by **major innovation in semiconductor enabled computing** provides long term growth opportunity

- **Shrink** is a key industry driver supporting innovation and providing long term industry growth

- Holistic Lithography enables **affordable** shrink and therefore delivers compelling value for our customers

- DUV, EUV and Application products are highly differentiated solutions that combined provide **unique value drivers** for our customers and ASML

- **EUV** will enable continuation of Moore’s Law and will drive long term value for ASML well into the next decade

- ASML models an annual revenue opportunity of **€ 13 billion** in 2020 and between **€ 15 - 24 billion** through 2025

- ASML expects to continue to return **significant amounts of cash** to shareholders through a combination of share buybacks and growing dividends while holding on to its long-held **conservative financial policy**