

TCFD recommendations: Climate-related disclosure

We know that if society continues to emit greenhouse gas at current rates, global warming will speed up and that temperatures above 2° Celsius (2°C) – relative to the pre-industrial period – could have catastrophic economic and social consequences.

This is driving a growing demand for decision-useful, climate-related information and the development of several climate-related disclosure standards. The Task Force on Climate-Related Financial Disclosures (TCFD) was established in December 2015 with the goal of developing a set of voluntary climate-related financial risk disclosures, which companies can adopt to inform stakeholders of the risks they face in relation to climate change.

The TCFD developed a stand-alone document for organizations to use when preparing disclosures, structuring their recommendations around four themes that represent core elements of how organizations operate: governance, strategy, risk management, and metrics and targets.

In this document, we aim to follow the TCFD's recommendations. The overview may not, however, fully comply with the recommendations of the TCFD. For example, going forward we aim to conduct more in-depth scenario analysis. This document also discusses risks related to climate-related matters but may not include all the risks that may ultimately affect ASML in this regard. Some risks not yet known, or believed not to be material, could ultimately have a major impact on our businesses, objectives, revenues, income, assets, liquidity or capital resources.

This document is a supplement of our Annual report 2020, and references are made to the Annual Report 2020.

Governance

[Disclose the organization's governance around climate-related risks and opportunities.](#)

Recommended disclosures:

- a. Describe the board's oversight of climate-related risks and opportunities.** Our Board of Management approves and signs off our Sustainability Strategy. The highest member of the organization directly responsible for sustainability matters is our Executive Vice President and Chief Strategy Officer (CSO), who is a member of the Board of Management.

Each of the material and corporate citizenship themes is assigned to a senior manager, who is responsible for monitoring progress against agreed targets, and ensuring sufficient resources are available to meet targets and objectives. In the event of insufficient progress, this is discussed at quarterly Sustainability Committee and operational performance review meetings, and raised with our senior management during a review meeting or other relevant committee meetings.

The Sustainability Committee is chaired by the CSO and COO, and includes senior management from various sectors. The Sustainability Strategy Office supports the Sustainability Committee in overseeing strategy execution. In our Sustainability Strategy 2019-2025, we have identified five priority focus areas, including climate change matter: People, Circular economy, Climate and energy, Responsible supply chain, and Innovation ecosystem.

Relevant senior manager(s) are responsible for each priority focus area to ensure sufficient resources are made available to meet the agreed targets/objectives and monitor progress. An executive Board member is also accountable for these targets/objectives.

Read more in Annual Report 2020: Materiality: assessing our impact

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- b. Describe management's role in assessing and managing climate-related risks and opportunities.**
- The Sustainability Strategy Office is responsible for:
- i. Developing and establishing the corporate wide sustainability vision, policies and targets together with the responsible senior management/business owners
 - ii. Stakeholder engagement, including sustainability related questionnaires, ratings and rankings
 - iii. Identifying global trends and opportunities
 - iv. Identifying risks and opportunities related to sustainability issues, including climate change and determining with the responsible senior management/business owners the responsive strategies (and investments)
 - v. Overseeing corporate-wide sustainability performance against agreed targets and information disclosure
 - vi. Facilitate quarterly executive review meeting and discussion.

In addition, we identify and assess the impact of climate-related risks and opportunities through an Enterprise Risk Management (ERM) process. We assess risks both top-down (company-level) and bottom-up (organization and process-level). Our risk management and control system is based on identifying external and internal risk factors that could influence our operational, business continuity and financial objectives. It contains a system of multidisciplinary assessments, monitoring, reporting, and operational reviews. The main value chain stages included, but not limited to, are our direct operations, upstream (our supply chain) and downstream (our customers) value chain.

Read more in Annual Report 2020: Semiconductor industry dynamics, Climate change risk and opportunities, How we manage risk

Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

Recommended disclosures:

- a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.**
- The time horizons we define for the short-, medium- and long-term are as follow:
- i. Short-term: from 0 to 1 year
 - ii. Medium-term: from 1 to 3 years
 - iii. Long-term: from 3 to 7 years

TCFD risk category: Current and emerging regulation, Legal

Time horizon: long-term

The Netherlands is part of the United Nations Framework Convention on Climate Change (UNFCCC) and a signatory of the Paris Agreement. The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase even further to 1.5°C. The Dutch government has set the goal to reduce GHG emission by 49% in 2030. Dutch industry's ultimate ambition is to be circular, and no longer emit greenhouse gases by 2050. Factories will then run on sustainable electricity from the sun and wind, or energy from geothermal energy, hydrogen and biogas. By 2030, the industry must already emit considerably less CO₂. This is an intermediate step on the way to full sustainability. Politicians can implement measures to achieve these goals, such as carbon-pricing mechanisms to reduce GHG emissions. We have seven manufacturing sites around the world. Veldhoven is the largest of these, representing around 80% of our total gross GHG emissions (scope 1 and 2 emissions). The Dutch government expects a considerable contribution from industry to achieve its emissions goals. Should carbon-pricing be implemented, then associated financial costs are estimated to be EUR 6.4 million (assumption of EUR 40 tax per unit). In addition, new regulations may restrict or lead to fossil fuels being abandoned altogether, which will lead to asset impairments.

We monitor climate change-related regulations and policies to understand the potential impact and opportunities for our business and stakeholders.

TCFD risk category: Technology

Time horizon: long-term

Climate-change issues have increasingly focused attention on product-energy efficiency. There is a risk we will not be able to develop new technologies to reduce energy consumption or the cost of the transition will be very high. In general, the success of new product introductions is uncertain and depends on our ability to successfully execute our R&D programs. Our lithography systems and applications have become increasingly complex, and accordingly, the costs and time involved in developing new products and technologies have increased. We expect this to continue to rise. In particular, developing new technology – including a multi-beam innovation and EUV technology (including High-NA) as part of our holistic lithography solutions – requires significant R&D investments, both by ASML and our suppliers, to be able to meet our own technology demands and that of our customers. Our suppliers may not have the means or may not be willing to invest the resources necessary to continue developing new technologies to the extent that such investments are necessary. This may lead to us contributing funds to such R&D programs or limiting the R&D investments we can undertake.

TCFD risk category: Market

Time horizon: medium-term

Historically, we have sold a substantial number of lithography systems to a limited number of customers. Customer concentration can increase due to continuing consolidation in the semiconductor manufacturing industry. In addition, although the applications part of our holistic lithography solutions makes up an increasingly larger portion of our revenue, a significant number of those customers are the same ones who buy our systems. With the increase in global awareness of climate change, managing the environmental impact of products is a concern for our customers and other stakeholders. They may prefer to change to products with lower carbon footprints. The lithography equipment industry is highly competitive, and our capacity to compete depends on our ability to develop new and enhanced lithography equipment, and related applications and services that are competitively priced and introduced on a timely basis.

TCFD risk category: Reputation

Time horizon: long-term

The semiconductor manufacturing process consumes large volumes of energy and water resources. Driving Moore's Law in enabling shrink and, at the same time improving computing power and storage capacity, fuels the demand for these resources. New architectures and a new way of looking at the entire ecosystem will be required to enhance energy and water-resource efficiency. To meet these challenges, the semiconductor industry has to reduce power consumption. With data centers consuming about 10% of the world's electric power, it touches the boundaries of scale. Taking action on climate change is a moral imperative. With the increase in global awareness of climate change, managing the environmental impact of products is a concern for our customers and other stakeholders. They may prefer to change to more products with lower carbon footprints. While helping the semiconductor industry to continue to realize Moore's Law, we seek to contribute to realizing the United Nations Sustainability Development Goals (SDGs) that aim to protect the planet and end poverty.

TCFD risk category: Physical risk (acute and chronic)

Time horizon: medium-term

As part of our Enterprise Risk Management process, we regularly evaluate the physical risks of climate change, acute and chronic – e.g. extreme weather conditions, chronic heat waves (drought) and the rise of sea level (floods) – that could have an impact on our facilities and disrupt our operations and/or damage our assets. The impact of these risks is deemed limited, as our main facilities and suppliers are not located in high-risk areas. These risks already exist within our industry. ASML has seven manufacturing sites around the world. Our headquarters at Veldhoven is our largest. We consider our current risk exposures to extreme weather to be limited, as our main facilities and suppliers are not located in high-risk areas. However, we monitor this risk as changes can occur in the future.

b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

Climate-related risks

TCFD risk category: Current and emerging regulation

- Risk driver: regulation and carbon pricing mechanisms
- Value chain: direct operations
- Likelihood and magnitude of impact: unlikely, medium impact
- Potential financial impact: increased direct costs

Description: Should a carbon tax be implemented, we estimate an increase in our operating cost of €6 million. This is calculated as the estimated cost of carbon tax of €40 per unit CO₂ multiplied by our scope 2 emission. We closely monitor the regulatory developments concerning climate change. In addition, in our Sustainability Strategy we focus on deployment actions for climate and energy and circular economy. For example, we implement our energy master plan with includes a renewable energy strategy.

Read more in Annual Report 2020: Climate and energy, Circular economy, How we manage risk

TCFD risk category: Legal

- Risk driver: legal and exposure to litigation
- Value chain: direct operations
- Likelihood and magnitude of impact: as likely as not, medium impact
- Potential financial impact: increased direct costs

Description: ASML has manufacturing sites and offices in 16 countries. These local sites are exposed to changes in governmental regulations and unfavorable political developments, which may affect the realization of business objectives or impair local assets. Such changes in the regulation that applies to our business can increase compliance costs and the risk of non-compliance. Non-compliance can result in litigation, fines and penalties and regulation could impact our ability to sell our products and services. We monitor the regulatory developments concerning climate change closely. In addition, in our Sustainability Strategy we focus on deployment actions for climate and energy and circular economy. For example, we implement our energy master plan with includes a renewable energy strategy.

Read more in Annual Report 2020: Climate and energy, Circular economy, How we manage risk

TCFD risk category: Market

- Risk driver: changing customer behavior
- Value chain: downstream
- Likelihood and magnitude of impact: as likely as not, high impact
- Potential financial impact: decreased revenues due to reduced demand for products and services

Description: There is a risk that customers or other stakeholders expect us to further reduce energy consumption. The demands for energy-efficient and environmentally friendly products is growing due to increased customer awareness of climate change and issues around environment pollution. Our customers operate in countries where strict GHG emissions supply and/or usage quotes by national law/regulations may apply. Customers may pass those requirements on to our products and services.

We enable innovative growth in the semiconductor industry by increasing the productivity of ASML's lithography tools. We are consistently and continuously advancing our technology. While increasing our products' productivity, we are also working towards reducing their energy consumption, to both enhance our energy efficiency and the energy used by the customer to produce a wafer. At the same time, we aim to invent, develop and manufacture our products in a more environmentally friendly way, striving to make sure they are manufactured and can be operated responsibly across their entire life cycle. Focus areas in our product-efficiency strategy include: a) Less energy per wafer output, b) Responsible use of energy by committing to only using the energy we need, and c) Contributing to energy-efficient fabs by providing more energy-efficient installation solutions

Read more in Annual Report 2020: Semiconductor industry trend and opportunities, How we innovate, Climate and energy

**Continues from Strategy -
Recommendation b.**

TCFD risk category: Physical risk

- Risk driver: acute physical risk, increased severity and frequency of extreme weather events such as cyclones and floods
- Value chain: direct operations
- Likelihood and magnitude of impact: as likely as not, high impact
- Potential financial impact: increased capital expenditures

Description: The physical risks of climate change – e.g. extreme weather conditions, chronic heat waves (drought) and the rise of sea level(floods) – could disrupt our operations and/or damage our assets. Through our ERM process and business impact analysis, we evaluate such risks regularly. The impact of these risks is deemed limited, as our main facilities and suppliers are not located in high-risk areas. While disruptions in access to water may represent a significant risk for some of our customers, water-related risk for ASML is limited. We have seven manufacturing sites, of which the four main facilities are Veldhoven (NL), San Diego (US), Wilton (US), Linkou (TW). Our main facilities are not located water high or extreme stress areas as classified by the World Resource Institute (WRI). Our San Diego site, however, is in a region where access to water can pose a risk.

Read more in Annual Report 2020: Climate and energy, How we manage risk

TCFD risk category: Physical risk

- Risk driver: acute physical risk, increased operational costs due to re-design and/or reduction/disruption in production capacity
- Value chain: upstream
- Likelihood and magnitude of impact: unlikely, medium impact
- Potential financial impact: increased direct costs

Description: Physical risk may result in disruption in our supply chain. Suppliers may not be able to deliver materials due to shifts in supply and demand for certain commodities (e.g. rare earth elements, minerals) requiring re-design changes in our products and / or requiring alternative materials. We monitor and evaluate such developments through our ERM process and our Supplier Risk Management program.

Read more in Annual Report 2020: Our supply chain, How we manage risk

Climate-related opportunities

TCFD opportunity category: Product and services

- Opportunity driver: development of new products or services through R&D and innovation
- Value chain: downstream

Description: Climate change regulations could increase the demand for energy efficiency products and potentially drive R&D and innovation to develop energy efficient lithographic systems could increase our sales or customer satisfaction.

As the markets of artificial intelligence, 5G connectivity, augmented reality, and the Internet of Things expand, consumers across the world are using ever-more powerful and sophisticated devices that are increasingly interconnected. These developments drive demand for microchips, which in turn drive demand for the chip-making systems that produce smaller, faster, cheaper, more powerful and energy-efficient microchips. We can only meet this demand by consistently and continuously advancing our technology. We monitor market trends in terms of power consumption to understand and evaluate impacts to, and opportunities for, our business and our customers. We have included energy efficiency of our products in our product roadmap. We are exploring opportunities to achieve energy savings for our latest EUV systems, which are now at the point of high-volume production.

Read more in Annual Report 2020: Semiconductor industry trends and opportunities, How we innovate, Climate and energy

Continues from Strategy -
Recommendation b.

TCFD opportunity category: Resource efficiency, energy source, (increased) resilience, (increased) resilience

- Opportunity driver: use of more efficient production and distribution processes, use of lower-emission sources of energy, resource substitutes/diversification, resource substitutes/diversification
- Value chain: direct operations, upstream, downstream

Description: Sustainable operations by more energy efficient facilities, production processes and transportation.

We are committed to minimizing our impact on the environment by improving our operational efficiency. Through our Sustainability Strategy, we aim to achieve zero carbon emission in our operations by using renewable energy, including infrastructure to reduce dependency on fossil fuels, renewable electricity, and reducing emissions in our value chain. We have developed a renewable energy strategy, which sets out our ambition to achieve zero emissions across our operations. We invest in renewable energy projects that help us achieve our renewable electricity usage target.

Enhancing energy efficiency is another priority at ASML. Our ambition is to achieve energy savings through process optimization. This includes a reduction in cycle times and by optimizing our global real-estate portfolio. Climate change and the rise of outside temperatures will force us to increase the cooling capacity in our factory locations. But it also creates an opportunity for us to install more efficient and effective cooling systems. This will reduce overall energy consumption for the installed cooling capacity.

As we move away from the linear 'take, make, dispose' model, we believe the circular economy is key to ensuring the future success and competitiveness of the semiconductor equipment industry. While continuously innovating, we also want to ensure the increasingly sustainable use of materials across our processes and value chain to reduce our environmental footprint.

We are committed to circularity in our operations and our products and believe that by doing so we not only limit our environmental impact but also generate business value. We do this by responsibly managing waste throughout our operations and maximizing the lifetime of materials in our systems, so extending their lifespans. The modular design of our products lets us extract the most value we can from the materials we use, and repurpose our products across their life cycles. To this end, we also work closely with our value chain. Transforming our economy to a circular model and promoting a conducive mindset is the joint responsibility of ASML, our customers and suppliers.

Read more in Annual Report 2020: Circular economy, Climate and energy

c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

Refer to sections above: Strategy - recommendation a and b

Risk management

Disclose how the organization identifies, assesses, and manages climate-related risks.

Recommended disclosures:

- a. Describe the organization's processes for identifying and assessing climate-related risks.** Our Enterprise Risk Management process assesses both top-down (company level) and bottom-up (organization and process-level) risks. It comprises financial and non-financial risk factors that could influence our operational, business continuity, financial and regulatory compliance objectives. The risk universe allows consolidated and comparative analysis across ASML. The financial and non-financial risk factors as identified in the risk universe are plotted in a risk landscape. The risk landscape contains the risk exposure as well as the main risk response (mitigating action). Both are discussed with the Board of Management and Supervisory Board. This Enterprise Risk Management process ensures that actions to mitigate risk are monitored through a system of multidisciplinary assessments, monitoring, reporting and operational reviews.

In addition, for Climate-related risks, we have used the Climate-Related Risks, Opportunities, and Financial Impact guidelines as provided by the TCFD in conducting our risk assessment on climate change risk. In this assessment we assessed and identified risks at both company level (e.g. political, legal, reputation, market, etc.) as well as at asset level (e.g. physical) and we have identified the climate related opportunities for our company to contribute towards lowering the impact on climate change.

Read more in Annual Report 2020: Climate and energy, How we manage risk, Risk factors

- b. Describe the organization's processes for managing climate-related risks.** *Refer to sections above: Governance - recommendation a and b, Risk management - recommendation a*
- c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.** *Refer to sections above: Governance - recommendation a and b, Risk management - recommendation a*
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Metrics and targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

Recommended disclosures:

- a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.** *Read more in Annual Report 2020: Circular economy KPIs, Climate and energy KPIs, Non-financial indicators - Circular economy, Non-financial indicators - Climate and energy*
- b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.** *Read more in Annual Report 2020: Circular economy KPIs, Climate and energy KPIs, Non-financial indicators - Circular economy, Non-financial indicators - Climate and energy*
- c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.** *Read more in Annual Report 2020: Circular economy KPIs, Climate and energy KPIs, Non-financial indicators - Circular economy, Non-financial indicators - Climate and energy*
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Special note regarding forward-looking statements

This document contains statements that are forward-looking, including statements with respect to sustainability and other TCFD targets and goals including climate neutrality, plan to reduce and eliminate hazardous substances, energy efficiency targets, conflicts minerals policy and commitment to comply with laws and regulations, including guidelines for handling hazardous materials and chemicals and other non-historical statements. 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", "target", 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 our 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, risks relating to our ability to comply with our TCFD goals and targets and the risk factors included in ASML's Annual Report on Form 20-F and other filings with and submissions to 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.