

**Letter of (December 21, 2023) from Minister of Economic Affairs and Climate Policy Micky Adriaansens and Minister for Foreign Trade and Development Cooperation Geoffrey van Leeuwen to the President of the House of Representatives on Dutch efforts to achieve a strong semiconductor ecosystem in geopolitically challenging times**

Microchips (semiconductors) play a major role in our daily lives and will continue to do so in the future. They can be found in smartphones, electric vehicles and medical devices, among other things. During the COVID-19 pandemic there was a temporary shortage of semiconductors. As a result, there were fewer medical devices and computers available. By increasing the development and production of semiconductors in this country and in the European Union, the Netherlands is seeking to prevent future shortages. For that reason the semiconductor industry must be able to grow while also remaining resilient. In this regard the Netherlands finds itself in a select group of countries that play an essential role in the production of semiconductors.

In previous letters to parliament,<sup>1</sup> the government shared its ambitions for enhancing the Dutch semiconductor ecosystem. The growing demand for semiconductors, and the changing geopolitical and geo-economic relations, make these ambitions more urgent. Therefore, we are pleased to inform the House that over the past few months a number of major milestones have been reached in this regard. This letter discusses these milestones in greater depth, particularly developments related to the European Chips Act and the Important Project of Common European Interest Microelectronics and Communication Technology (IPCEI ME/CT). In addition, various aspects of semiconductor technology will be strongly represented in the National Technology Strategy, which the House will be informed about further in early 2024.

Changing geopolitical relations, a business climate that is facing numerous challenges and worldwide government interventions in the value chain mean that the Dutch position in the global semiconductor ecosystem is always under pressure. So further action is needed, in order to ensure that we have sufficient semiconductors for our devices in the future, that the growing sector continues to make a major contribution to our earning capacity and that the Netherlands remains a key international player.

The government is working with the industry and the knowledge sector to expand the market share of Dutch semiconductor companies within the global value chain in the coming 10 to 15 years. This objective can only be achieved by addressing a number of underlying policy priorities. These policy priorities encompass the business climate, talent development, physical space for growth, the protection of knowledge and technology, and international partnerships to promote our ambitions. In the coming year, additional action plans will be formulated for these five policy priorities. Consistent and reliable government policy in this area is necessary in order to give companies certainty and stimulate long-term investment.

The first part of this letter presents a brief outline of the Dutch semiconductor ecosystem. This is followed by an overview of the policy priorities that the government intends to pursue, now and in the future, and a consideration of the milestones represented by the Chips Act and the IPCEI ME/CT. Finally, this letter will offer a glimpse into a new consultative platform which brings together government, knowledge institutions and industry to achieve the aforementioned policy priorities.

### **The Dutch semiconductor ecosystem**

The Dutch semiconductor ecosystem consists of around 300 companies and knowledge institutions, most of which are concentrated around the universities of technology in Eindhoven, Delft and Twente. There are also major semiconductor companies based in and around Almere and Arnhem/Nijmegen. This clustering of activities around universities and institutions of higher professional education is a good reflection of the very close cooperation between the companies in question and knowledge institutions. This partnership forms the basis of the Dutch ecosystem's

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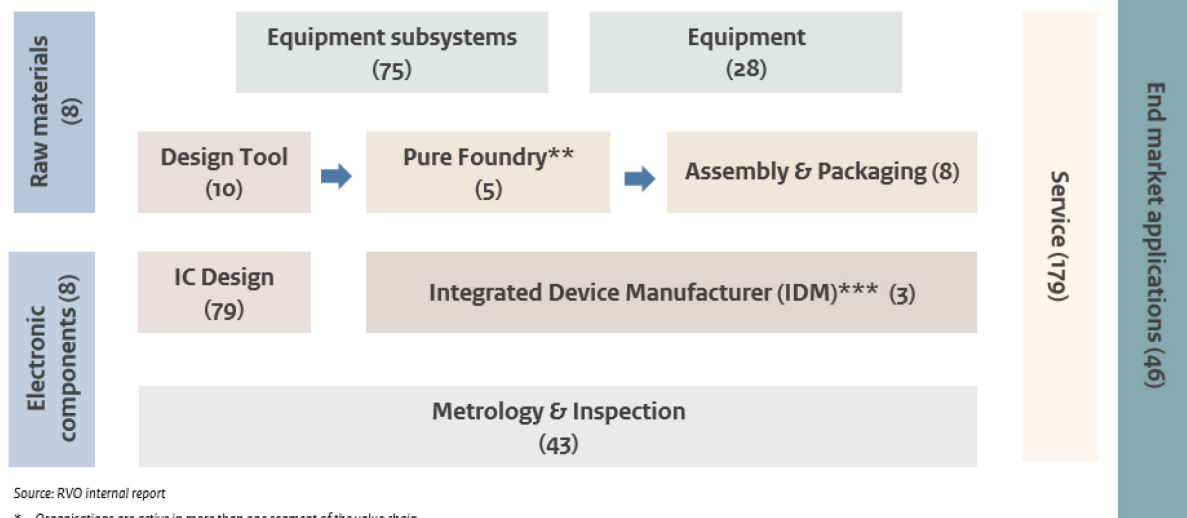
These include:

[Government Gazette 2021, 20378 \(officielebekendmakingen.nl\)](#).

Parliamentary Paper 33 009/32 637, no. 121; Parliamentary Paper 35 982, no. 9; Parliamentary Paper 2021D38167 and Parliamentary Paper 22 112, no. 3369.

strong innovation position. The figure below offers an overview of Dutch activities in various segments of the semiconductor value chain. Dutch companies and knowledge institutions are active throughout the entire value chain and are deeply embedded in local and regional supply chains and partnerships.

## NL Semiconductor ecosystem - 336 Organizations\*



The Netherlands has a unique position in the field of mechatronics, with global players like Besi, ASM and ASML. This position is thoroughly linked to a regional network of suppliers, such as the Netherlands Organisation for Applied Scientific Research (TNO), VDL ETG, Neways, NTS Group and Prodrive. SMEs play a key role in this cluster, including a number of highly innovative and globally active companies like Salland Engineering, Nearfield Instruments and Trymax. Both NXP and Nexperia are active in the field of analogue chips in the Netherlands. In addition, the Netherlands has a great deal of potential in the area of chip design, packaging and photonic chips. For instance, Dutch photonic companies such as SMART Photonics and EFFECT Photonics are able to profit from the advanced knowledge possessed by the semiconductor companies in this country, thanks in part to PhotonDelta. As a result of this, the Netherlands has a crucial position in this area as well. For example, earlier in the year, the Dutch government, together with ASML, NXP and VDL Groep, set aside €100 million for the Eindhoven photonic chip plant SMART Photonics.

Although not formally part of the Dutch ecosystem, the partnership between Dutch semiconductor companies and the Flemish research institute Imec should also be noted in this context. The Veldhoven-Leuven axis, which is a factor in determining the speed with which innovations within the semiconductor sector take place around the world, forms the heart of the European ecosystem. This is a unique partnership within the complex semiconductor value chain, which should be further strengthened beyond national borders.

### A strong Dutch ecosystem, embedded in Europe

The international order is undergoing fundamental changes. Maintaining a leading position in the development of crucial technology and the presence of domestic production capacity have become a form of geopolitical leverage. Because semiconductor technology is used in everything and crucial for the development of new technology, the semiconductor sector finds itself at the centre of global power politics. Over the past few decades the global semiconductor chain has come to be organised with such efficiency that there is now a large degree of geographic consolidation. Large government grants have also contributed to this streamlining. European chip manufacturers are now outsourcing certain aspects of production to Asian companies, making the Netherlands and Europe largely dependent on Asia for the production of semiconductors. The geographic consolidation of manufacturing, in combination with the worldwide dependence on semiconductors, means that the value chain is vulnerable to disruption. The strategic importance of semiconductors

to our national security, economy and social challenges means that further efforts are necessary to keep the value chain secure and resilient. Dutch semiconductor policy is therefore focused on strengthening the European ecosystem and thereby ensuring a globally relevant position for Dutch businesses.

To this end, we are taking a number of steps that are necessary for the Netherlands to remain a major global player in the next 10 to 15 years, by boosting the indispensability of the European value chain in the global semiconductor industry while increasing the resilience of supply chains for the European industry. In this spirit, we are joining forces with the industry to invest in expanding knowledge about this complex value chain, within central government and beyond, in order to shape a more focused policy for the industry. Finally, the government is seeking to form new strategic partnerships and technology alliances in order to bolster our position. Recently, Dutch semiconductor policy has aligned itself with the three priorities set out in the European Economic Security Strategy:<sup>2</sup> promote, protect and partnerships. These three priorities represent the integrated approach that must be followed, given the sector's strategic nature, in order to remain a relevant player. Now and in the future. This calls for a long-term policy approach, with more coherence and continuity as regards the various policy priorities.

The following policy priorities serve as guidelines for boosting the market share of Dutch semiconductor companies within the global value chain in the next 10 to 15 years.

We seek to create an attractive and competitive ecosystem in the Netherlands, where companies and knowledge institutions can establish themselves, grow, share knowledge and innovate.
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The leading position of Dutch semiconductor companies and knowledge institutions should not be taken for granted. We are working today to create the ecosystem of tomorrow. Government and the sector are investing jointly in space to grow, to innovate and to train future talent. We are doing so not only with general tax, innovation and industrial policy instruments but also with additional, sector-specific policy which is being developed at national and European level. In this way the Netherlands contributes to the European Commission's objectives for increasing the share of the European market in the global semiconductor chain. This will make the EU less vulnerable to dependence on the production of semiconductors in third countries, thereby boosting security and stability of the supply chain for deliveries to European industry.

General innovation and industrial policy makes a major contribution to the strong position of the Dutch ecosystem, especially in terms of research and development. Companies and knowledge institutions can take advantage of various government schemes for this purpose. Each year this highly capital-intensive sector makes use of over €900 million in public funds. The size of the market is expected to exceed €1 trillion by 2030, which will make a significant contribution to the Netherlands' earning capacity.

The sector mainly uses general tax-related instruments. Thanks to the high R&D investments in this sector, many companies use the tax benefits for innovation (e.g. the Research and Development (Incentives) Act (WBSO) and the innovation box (tax relief for innovation)). There are also a number of general schemes – such as allowances for public-private partnerships, innovation credits, a scheme for stimulating cross-regional SME innovation in top sectors, and early-stage financing – all of which enhance the innovation position of semiconductor companies. In addition, companies and knowledge institutions are also eligible for sector-specific grant programmes. Invest-NL (via the Deep Tech Fund), the regional development agencies and the Dutch Research Council (NWO) also invest in the growth and development of the Dutch ecosystem. A number of these programmes and sector-specific policy initiatives are explained in greater detail below.

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<sup>2</sup> [Joint Communication on European Economic Security Strategy.](#)

Enhancing the Dutch semiconductor ecosystem is a challenge that the government, the business community and knowledge institutions are taking on collectively. To that end, ambitious **national agendas and road maps** are being developed for various aspects of the semiconductor value chain. For example, over the past year the Ministry of Economic Affairs and Climate Policy and the Ministry of Foreign Affairs, together with ASM and ASML, drew up an agenda for the wafer fab equipment segment, in which the government and private sector agreed on the necessary steps to take in order to remain a world leader in this part of the chain. The Semiconductor Manufacturing Equipment Roadmap by ASML and TNO and the 'National Semiconductor Strategy: towards an integrated Dutch strategy for the semiconductor industry', in which Brainport is the leading party, are key initiatives devised with and by the sector. In the past few years a number of national agendas have already been developed for integrated photonics. For other aspects of the chain, such as chip design and packaging, exploratory studies have been launched in order to draw up agendas.

At a national level, the **National Growth Fund** is a key instrument for stimulating innovation in the realm of the energy transition, health and security. It is also an important tool for achieving the public-private goal of spending 3% of the GDP on R&D. Grants to recipients like the Einstein Telescope, PhotonDelta, Quantum Delta NL, AiNed and NXTGEN Hightech all contribute to the development of the semiconductors of the future. For example, the €450 million from the Growth Fund allocated to NXTGEN Hightech, out of a total investment of €1 billion in sustainable energy, laser communication, faster semiconductors, etc., helps position the consortium as a leading force in Europe. A sum of €471 million has also conditionally been granted to PhotonDelta to help make the Netherlands the epicentre of the next generation of photonic chips. This sum will be increased to €1.1 billion with private contributions.

The **European Chips Act** is the flagship piece of legislation of European efforts to promote the semiconductor industry. On 21 September 2023, this European law entered into force – a major milestone in achieving European ambitions. The goal of the Chips Act is to boost Europe's competitiveness and resilience with respect to semiconductor technologies and applications and to contribute to the digital and green transitions. In support of these objectives, the European Commission launched the Chips Joint Undertaking (JU) on 30 November. This paves the way for public-private investments of around €11 billion in R&D, innovation and future production capacities in Europe. On the basis of the leading position of Dutch semiconductor companies and knowledge institutions, the Netherlands played a key role in the creation of the aforementioned initiatives.

With its three pillars, the Chips Act aims to strengthen European capacities across the board – from innovation to production. The Chips for Europe Initiative, which falls under the first pillar, consists of five parts:

- 1) design capacity for integrated semiconductor technology;
- 2) 'pilot lines' for innovative production, testing and experimentation facilities;
- 3) technical capacity to accelerate the development of quantum chips;
- 4) a network of knowledge centres for the development of skills (competence centres);
- 5) setting up a Chips Fund to facilitate access to capital for startups, scale-ups and SMEs.

Within Pillar 1, in addition to supporting R&D, the Netherlands is focusing on setting up a Dutch competence centre, supporting a virtual European semiconductor design platform and linking Dutch companies, knowledge institutions and Growth Fund initiatives to the EU Chips JU pilot lines. An annual budget of €35 million has been set aside for the participation of Dutch parties in the Chips JU. European co-financing represents another €35 million annually, meaning that there is a total of €70 million available each year for the participation of Dutch companies and knowledge institutions.

Pillar 2 consists of a more flexible state support framework designed to encourage public and private investment in manufacturing facilities. It is focused not only on 'first of a kind' capacities for large-scale production, but also on machine construction and materials.

The last pillar of the European Chips Act, Pillar 3, establishes a monitoring and coordination mechanism for use in the event of a crisis. In addition to these three pillars, efforts are also being made in the area of international cooperation and the formation of mutual semiconductor partnerships with like-minded countries.

On 8 June the European Commission granted its approval to projects by around 70 companies from 14 member states in the framework of the **Important Project of Common European Interest Microelectronics and Communication Technology** (IPCEI ME/CT). An IPCEI<sup>3</sup> is an integrated European project consisting of multiple national projects undertaken by companies and/or research institutes from various EU member states that are complementary, create synergy and contribute to strategic European goals. On 8 November the four participating semiconductor companies in the Netherlands received the official decisions, informing them that the earmarked government support of €220.5 million has been pledged to four approved innovative projects. This sum is part of a total of €8.1 billion in public funds, leading to another approximately €13.7 billion in private investment. The Dutch projects are radar and 6G technology (both NXP), and the manufacture of the latest machines for advanced semiconductor production (individual projects undertaken by ASML and Nearfield Instruments). This is also a major step in the direction of European semiconductor ambitions and the project can now take off. In the years ahead a great deal of attention will also be paid to the positioning of the IPCEI ME/CT in the broader semiconductor ecosystem. The European Commission has set up a task force for this purpose, which will operate on the basis of a detailed work plan. The Netherlands is a member of this task force, and in 2025 it will host the third IPCEI ME/CT General Assembly.

**XECS** is the sixth Eureka cluster in the field of microelectronics since the organisation was started in 1989. XECS is an intergovernmental programme – in other words, not one set up by the European Commission – to which the Netherlands contributes, with an annual budget of €10 million. Unlike the Chips JU the XECS is also open to non-European Eureka countries. Projects require cooperation between companies and/or knowledge institutions from at least two countries. Projects can focus on national strategic interests and need not by definition serve a pan-European interest.

European programmes like **Eurostars and Horizon Europe** (an average of €13.5 million per year) support dozens of Dutch parties, especially large companies and photonic firms. With the help of its predecessor the Key Digital Technologies Joint Undertaking and the current Horizon Europe Cluster 4: Digital, Industry and Space, various projects are opened every year to, mainly, fundamental research in the field of semiconductor technology. Dutch SMEs are well represented in European funds such as ERDF, Interreg and REACT-EU (an average of €6 million per year).

We are investing jointly in attracting and training talent: from vocational to academic education.

A shortage of **talent trained in scientific and technical fields** is one of the biggest global challenges for the semiconductor industry. With the rising demand for semiconductors and for increasing measures to protect and prevent the risk of the unwanted transfer and theft of knowledge and technology, the shortage will only increase in the years ahead. In light of this we are working on developing shorter-term solutions, which depend on attracting international talent and knowledge migrants. In addition, over the longer term it will be necessary to train more people in technical fields in the Netherlands. Efforts are being made to achieve better alignment between education and the labour market in the technical sector, so as to reduce the shortage of technical personnel. This is done through public-private partnerships such as the National Technology Pact and the Green and Digital Jobs action plan.<sup>4</sup> In addition, the government welcomes private initiatives in which companies introduce pupils and students in primary education and from vocational to academic education to working in the semiconductor industry. In this connection the government also supports the international exchange of talent. One way is through

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<sup>4</sup> Parliamentary Paper 29 544, no. 1173.

talent programmes that bring together companies and universities in South Korea and Taiwan. The unique position of the Netherlands' semiconductor ecosystem must also be reflected in a leading global position in the area of education and talent development.

We are giving the semiconductor industry the space to grow in the Netherlands.

Like many other sectors, the semiconductor sector is facing spatial challenges, such as grid congestion, housing shortages, and limited opportunities for physical expansion. The Ministry of Economic Affairs and Climate Policy and the local regions are engaged in an ongoing dialogue with individual companies about these issues. Where possible, a customised approach will be adopted to remove barriers to growth.

We are working to prevent the unwanted transfer and theft of knowledge and technology, where necessary with a customised approach for individual companies.

As noted in the government's assessment of the European Economic Security Strategy and elsewhere<sup>5</sup>, the government is pursuing a policy to ensure that risks to national security that arise in the economic domain remain controllable. In order to reduce these kinds of risks, the government has a wide range of instruments at its disposal, including investment screening, export controls, knowledge security measures, criminalisation of espionage, and cybersecurity. The House was recently informed about the full range of instruments that can be used to prevent the unwanted transfer and theft of knowledge and technology, which also applies to semiconductor knowledge and technology.<sup>6</sup> With regard to export controls the government published a ministerial order on 30 June for the introduction of a licensing requirement for advanced manufacturing equipment for semiconductors.<sup>7</sup> The government is working to help achieve the European Commission's goal of improving coordination and cooperation on economic security policy at EU level. The government is also working with individual companies to determine whether additional measures are necessary in order to protect their strategic knowledge and technology. Because of the major impact of semiconductor technology on national security, this technology has also been designated a priority in the European Commission's recommendation to conduct risk analyses on 10 critical technologies<sup>8</sup> and the aforementioned National Technology Strategy.

We proactively enter into international partnerships with allies and like-minded countries to safeguard our relevance in the value chain.

As a result of the geopoliticisation of semiconductor technology, we see that countries such as the US and China, and also Japan and South Korea, attach great strategic value to strengthening their position in global value chains. This is done often by means of substantial government investment. In this way they are seeking to enhance their own semiconductor sectors and reduce dependencies on third countries. This gives rise not only to commercial and other kinds of opportunities for Dutch companies, but also challenges in keeping the markets open and fair. This is why the government is proactively pursuing partnerships with allies and like-minded countries to work jointly on the semiconductor supply chain of the future. This leading role is a good fit for the Netherlands on account of its leading position in the global semiconductor chain and the importance of open markets and international cooperation to the Dutch ecosystem. In this

<sup>5</sup> Parliamentary Paper 22 112, no. 3761.

<sup>6</sup> Parliamentary Paper 30 831, no. 199.

<sup>7</sup> [Government Gazette 2023, 18212 | \(officielebekendmakingen.nl\)](#).

<sup>8</sup> Parliamentary Paper 22 112, no. 3826.

connection the Netherlands focuses mainly on enhancing the European ecosystem and its relations with the Indo-Pacific and the United States. A compelling European narrative about the importance of a strong semiconductor industry for the entire EU, which builds on existing competences in Europe, is important in this regard. In the coming months the Netherlands will take the lead on this, together with the industry. In addition, the government has taken a closer look at what the Netherlands needs to do in order to forge a more strategic partnership with the Indo-Pacific, where large parts of the value chain are located, in order to achieve its own ambitions. Making choices about what will systematically contribute to a strong and resilient ecosystem in the Netherlands is necessary for this purpose. In addition, we will continue to use the full range of international enterprise instruments at our disposal in order to give Dutch companies an international platform.

A good example of this is the Flemish-Dutch economic mission to Arizona and San Francisco/Silicon Valley devoted to semiconductor technology which took place in early December 2023. A delegation of over 50 Flemish and Dutch companies and knowledge institutions had the opportunity to get acquainted with the US ecosystem, exploring opportunities to broaden and deepen cooperation with American companies. It was also announced that in the next five years ASM would be investing \$300 million in an advanced semiconductor factory in Scottsdale, Arizona.

### **Announcement of a new consultative platform with the semiconductor industry**

Consultations are already in full swing with companies and knowledge institutions from the semiconductor sector in support of the aforementioned policy initiatives. To improve the coherence and continuity of these actions, the government is establishing a consultative platform (working name: Semiconductor Board NL). This platform will consist of representatives from the business community (a combination of SMEs and large companies), knowledge institutions and government, and it will meet on a regular basis. The exact composition of the platform will be worked out in the coming weeks in consultation with representatives from the private sector. The Semiconductor Board NL will meet for the first time in the first quarter of 2024. Its composition will make it possible to strategically approach priorities, bottlenecks and developments from various perspectives. This public-private partnership thus makes it possible to take a comprehensive view of both commercial opportunities and geopolitical threats to the sector, to flag issues facing the Netherlands and to consult about technological developments, in advance of the regular policy cycle. The platform will also devise the aforementioned action agendas following from the five policy priorities and monitor their implementation. And it will gather input for the benefit of the European Semiconductor Board, which was created by the European Commission as part of the implementation of the European Chips Act.

This new public-private partnership is an indispensable step in achieving the goal of increasing the market share of Dutch semiconductor companies in the coming 10 to 15 years and implementing the aforementioned policy priorities in geopolitically challenging times.