The new generation of high tech equipment for future generations
NXTGEN HIGHETECH

The new generation of high tech equipment - for future generations

The Dutch are frontrunners in high tech equipment

Dutch companies produce high tech equipment used for the manufacturing of semiconductors and medical instruments, data communication, and other markets that continue to redefine the boundaries of technological possibility. A crucial pillar of the Dutch economy, high tech equipment makes up a large share of the Dutch export total. Further growth therefore substantially contributes to the growth of the economy overall. High tech equipment also offers solutions for the biggest challenges our society is facing, from the energy and climate transition, optimal health care, and safe communication to the sustainability of our food chain. It is also at the core of (European) production and technology sovereignty, which has proved to be crucial during the COVID-19 pandemic.

A leap forward is necessary

Our world-class high tech equipment is a result of the expertise and entrepreneurship of all players and their close cooperation: companies, knowledge institutions, governments and funders have achieved this success together. Companies like ASML, Philips, NXP, VDL, Lely and Medtronic, as well as their ecosystems, are internationally leading players. However, this strong position should not be taken for granted. Partly due to political interests, the competition in other parts of the world is increasing. Though substantial investments are sorely needed, Dutch investments in R&D fall behind internationally. In addition, a large part of the ecosystem consists of suppliers and start-ups with limited scope for investments, making disruptive innovation and diversification towards new applications under their own steam a challenge. The players in the ecosystem have a lot in common, starting with a base in key technologies such as system engineering, optomechatronics, and robotics. Therefore, a substantial joint investment is needed to enable further technology and market development. To be able to strengthen future earning capacity, the Dutch high tech equipment ecosystem needs to take a leap forward.

The NXTGEN HIGHETECH program initiates that leap

Investment program NXTGEN HIGHETECH initiates this necessary leap with the objective of making the Dutch high tech equipment ecosystem one of Europe's leading high tech clusters by 2030. The program aims to develop a new generation of high tech equipment focusing on sustainability, digitisation, health and technology sovereignty. In order to keep production in the Netherlands and the EU profitable, the equipment is manufactured, applied and maintained through digital technology, strengthening the earning capacity and tackling societal challenges in the Netherlands at the same time. We are striving towards a new generation of technology which will benefit the future generation of people: our children.
Six areas of application making the Netherlands stronger

NX NXTGEN HIGHTECH will be developing new equipment in six areas of application with a shared basis in key technologies. Examples of the intended leap forward:

- Clean energy: clean hydrogen by manufacturing efficient electrolysers using thin film technology.
- Data communication: transferring from radio to light. Communication through laser beams is safer and has a much higher capacity.
- Health equipment: production technology for new chips used to simulate organs and accelerate the search for new medicine without the need for animal testing.
- Stacked microchips: a step towards even faster and more efficient chips that partly switch using light as well.
- Compact, flexible and robotised production lines for lightweight composite structures.
- The food chain: introducing faster and more precise robots in agriculture and horticulture.

The proposed solution: towards a coherent, leading high tech equipment ecosystem
The NXTGEN HIGHTECH program facilitates joint ventures by companies and knowledge institutions focused on the development of new value chains, new activity and international positions. The program is built on three coordinated pillars:

1. **Six application programs**: the program stimulates and supports consortia aiming to obtain pivotal positions in new value chains. Many consortia consist of a mix of start-ups, suppliers, Original Equipment Manufacturers (OEMs), Original Module Manufacturers (OMMs) and knowledge institutions. Some 340 players are ready to start developing these 'control points' across 42 different projects.

2. **Technological and scientific advancements**: the program strengthens the technological and scientific foundation for the applications. A deeper knowledge of relevant system and key technologies is crucial in order to ensure the high tech equipment ecosystem is futureproof. This technology foundation will be strengthened by the 42 projects mentioned above, in addition to the open calls available for new perspectives and players.

3. **Ecosystem**: the program promotes intensive collaboration across a range of scientific disciplines and sectors, focusing on six aspects: building a joint vision, developing physical locations, attracting investment capital, recruiting and retaining talent and trainings, closer collaborations in the ecosystem, and internationalisation.

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**Who will be first to apply wireless data communication by laser?**

Wireless data traffic uses radio waves. However, the spectrum is filling up, capacity is limited, and data can be wiretapped. Laser beams provide a whole new alternative. Laser light is able to effortlessly travel thousands of kilometres, has a huge capacity, and is both energy efficient and safe: as laser beams are targeted, wiretapping and disrupting them becomes that much more difficult. Dutch scientists and entrepreneurs are taking the lead in (laser) light and have been applying it to areas such as astronomy and semiconductor manufacturing for years. The challenge we are facing now is to apply this knowledge to laser terminals as quickly as we can, as they are the crucial links in the entire communications chain. Companies like Airbus and Viasat see this challenge as an opportunity and are collaborating with researchers from – for example – TNO, companies such as VDL and Demcon, and innovative start-ups like Single Quantum and EFFECT Photonics in order to develop these terminals. Whoever will be first to offer these crucial links will be guaranteed a key role in a tremendous growth market. This will require new technology, close and long-term collaborations, and significant investments. NXTGEN HIGHTECH is up to the challenge.
The result: higher earning capacity and future-proof solutions

The Dutch high tech sector accounts for a GDP contribution of 72 billion euros per year. NXTGEN HIGITECH aims for extra GDP growth, from 11 to 16 billion per year in 2040. In addition, the program provides the high tech sector with a new technology base, tackling important societal challenges at the same time. Between 2022 and 2029 investments amounting to 1.2 billion euros are needed, over half of which will stem from the Growth Fund.

Starting right away with over 340 companies and knowledge institutions

The parties participating in NXTGEN HIGITECH consist of 189 SMEs (including 75 young start-ups and scale-ups), 130 larger companies and 23 knowledge institutions. Roughly 1500 researchers and innovators are contributing. With a letter of intent these organisations have shown their commitment towards giving the program a running start. A contribution from the Growth Fund is a vital prerequisite for achieving this goal.