



The Innovation Compass of the East Netherlands appendix





Appendix – MedTech & Prevention

1. Ambition for 2030

The East Netherlands is the leading region for medical technology and prevention, offering a unique combination of high-tech innovation, practical application and economic value creation. By 2030, we will be one of Europe's top MedTech regions. Our ambition is clear: every year, we will bring 10% more co-creation innovations to market, particularly in areas such as chronic care, elderly care and prevention. This will lead to healthier residents, lower healthcare costs and economic growth through strong MedTech SMEs, more employment and investment. The region links key technologies such as photonics, chip technology, AI and organ-on-a-chip directly to specific healthcare and prevention issues, enabling innovations to be validated and implemented more quickly in neighbourhoods and healthcare institutions. We provide products and services for remote care, point-of-care applications, imaging and e-health – accessible and affordable, in urban and rural areas.

2. Challenges & transitions

The healthcare system is under severe pressure due to an ageing population, chronic diseases, staff shortages and rising costs. Without intervention, healthcare will consume all economic growth by 2060. Innovation is therefore essential, provided that it is actually implemented. The East Netherlands is in a unique position in this regard: rural areas with greater distances to hospitals make the region an ideal testing ground for digital healthcare and preventive solutions. Demographic trends (22% elderly people in the East Netherlands versus 20.5% nationally) reinforce the urgency. Cross-border cooperation with north-western Germany, which faces similar challenges, increases scalability and impact.

The acceleration of digital healthcare is also an economic necessity: it creates new products, services and business models and strengthens start-ups, scale-ups and SMEs. The East Netherlands can become a European leader by linking deep tech (Twente, Arnhem-Nijmegen) to clinical validation and public-private upscaling. In a rapidly growing, fiercely competitive MedTech market (US/China), this requires targeted reinvestment. Visible implementation power raises our profile and attracts investment, partnerships and market introductions.

3. Impact & SDG's

The MedTech & Prevention 2030 ambition contributes broadly to the Sustainable Development Goals:



Good health & well-being: better access to care, focus on prevention, chronic care and elderly care.



Decent work & economic growth: growth of MedTech SMEs, more employment and investment.



Industry, innovation & infrastructure: testing facilities, clinical validation and public-private scaling.



Sustainable cities & communities: preventive care integrated into the living environment.



Partnerships: strong public-private collaboration, nationally and internationally.

Indirectly: SDG 4 (education), SDG 10 (reduced inequalities), SDG 12 (sustainable production).

4. Sub-themes & example projects

There are two example projects in the East Netherlands:

- **Digital Health Challenge Lab (DHCL)** is an innovation programme in Arnhem, Nijmegen and Wijchen that brings together healthcare institutions, housing associations, businesses and knowledge institutions to develop, test and scale up new digital healthcare and welfare solutions. Its strength lies in linking practical questions to technological solutions and knowledge, enabling implementation and scaling up. As a testing ground and flagship project within Think East Netherlands, DHCL demonstrates how the East Netherlands MedTech and prevention ecosystems are joining forces to make a lasting impact on healthcare.
- **The Hospital of the Future (2050)** is being developed in Twente as a living lab and incubator where healthcare innovations are developed at an accelerated pace and put into practice. The hospital and the surrounding (international) region function as a low-regulation testing ground, where

labour-saving technology and digital healthcare solutions can be directly applied and scaled up. The goal is a tenfold reduction in labour: from approximately 4,000 to 400 employees, with comparable effects in the region.

Other examples of MedTech qualities in the East Netherlands are:

Technology in healthcare practice: ChipTech in MedTech: linking semiconductors, photonics, sensor technology and biomolecular technology (including UT, Radboud University, NXP, Nexperia, New Origin, AI-on-a-chip, lab-on-a-chip, Radboud UMC, WUR, CITC, OnePlanet Research Centre, PhotonDelta).

Integrated infrastructure: TechMed Centre (with Technical Medicine programme), MITeC, OnePlanet Research Centre, Health Valley and Briskr offer a continuous line from research to implementation.

Challenge-based and use case innovation:

Innovations based on specific healthcare needs (HealthTech Accelerator, HealthTech Nexus, ProBono, PIHC vouchers and citizen science initiatives).

Cross-border collaboration: Structural Interreg programmes (CARE-FLOW, HEALTH4DE-NL, BRIDGE, SMART GUT) with German hospitals and universities.

Cross-sectoral strength: connection between MedTech × ChipTech × Agri/FoodTech (including OnePlanet Research Centre and CITC) creates new innovation niches.

5. Contribution to the Netherlands & Europe

National: MedTech is directly linked to IZA and AZWA tasks and provides, among other things, labour-saving technology. The East Netherlands is strong in starting up new businesses in MedTech and Prevention. The ecosystem contributes to national coordination, validation, CE marking and early market adoption.

European: The East Netherlands is an exemplary region for implementation-oriented MedTech; the combination of high-tech, co-creation & behavioural science and healthcare & social domain sets the East Netherlands apart from other European regions. The region is working in both urban and rural areas towards a strong infrastructure for the development, testing and implementation of medical technology, linked to unique areas of expertise such as photonics, chip technology, AI and organ-on-a-chip. In this way, the ecosystem contributes to strengthening Europe's strategic autonomy.

Cross-border: Structural cooperation with German partners such as in North Rhine-Westphalia via test

locations, knowledge exchange and joint market access, with an active cross-sectoral approach and focus on social embedding, make the ecosystem scalable and relevant beyond national borders.

6. Ecosystem

Through the coordination of mutual activities and with a shared infrastructure, this is the East forum for the transition from care to health.

The MedTech & Prevention ecosystem is compact and powerful:

- **Knowledge institutions:** UT/TechMed Centre, Radboudumc, Radboud University, Saxion, HAN, Windesheim, WUR and CHE, and secondary education.
- **Companies:** broad chain of start-ups, scale-ups and SMEs active in sensors, imaging, e-health and devices.
- **Networks & clusters:** economic boards, Health Valley, Briskr, AI hub East Netherlands, Novel-T. East NL, Technology and Care Academies.
- **Facilities:** simulation labs (UT, Saxion, Windesheim), OnePlanet Research Centre, CITC, neighbourhood-oriented living labs. And incubators at universities, colleges and secondary school practories.

7. Goals & indicators for 2030

- Annual +10% increase in successful MedTech innovations from co-creation.
- Annual growth in CE-certified market launches, private and public investments, and the number of medium-sized and large MedTech companies.
- Measurement via recurring qualitative research, supplemented with available quantitative data per theme line within the ecosystem.

8. Investing in innovation

Targeted investments are needed to realise this ambition:

- **Government:** national support centre for medical legislation and regulations (~€2 million/year), accelerating CE marking, launching customership with health insurers.
- **Europe:** access to international testing facilities, link with Horizon Europe and larger funds.
- **Region:** strengthening networks, scale-up support and a joint innovation agenda.

In addition, pilot projects with new funding models (budget allowances, outcome-based financing) are needed to embed innovation in healthcare practice.



Appendix – Smart Food Production

1. Ambition for 2030

By 2030, the East Netherlands will be Europe's testing ground and development region for smart and sustainable food production. Here, we will develop and demonstrate the food chains of the future, with an emphasis on the protein transition, climate-proof crops and net-zero production. Innovations will not only lead to healthier and more sustainable food, but also to technologies and knowledge that can be applied worldwide.

Our strength lies in the combination of Wageningen University & Research (WUR) as a global knowledge centre, a strong agri-food tradition and a dynamic ecosystem in which knowledge institutions, companies and governments work together. Crossovers with AI, robotisation, circular economy and smart energy solutions make us unique.

2. Challenges & transitions

The global food system is under pressure. Climate change threatens harvests, geopolitical tensions disrupt supply chains, labour shortages are increasing and demand for food is growing. The Netherlands has traditionally been a leader in this field, but is losing ground to countries such as Singapore, Israel and the US. At the same time, strict EU regulations and limited investment are hampering the upscaling of new technologies.

Smart Food Production makes a direct contribution to three major transitions:

- **Protein transition:** from animal to plant-based and alternative protein sources
- **Climate transition:** resilient crops and low-carbon production.
- **Digital transition:** application of robotics, AI and precision agriculture

3. Impact & SDG's



No hunger: a more self-sufficient and food-secure Europe.



Health & well-being: healthier food and prevention.



Responsible consumption & production: circular chains and net-zero systems.

The impact is both social (healthy food, smaller footprint) and economic (new economic activity, export of knowledge and technology).

4. Sub-themes & example projects

- **Protein transition:** stimulating the breeding, production and processing of new protein crops. Preci-fermentation development and scaling up in the Biotechnology Fermentation Factory.
- **Climate resilience:** towards a more resilient and climate-robust food system, including through crop breeding, data-driven and regenerative agriculture, and attention to water issues. Soil Valley, Regenerative Innovation Portfolio project.
- **Net-zero production:** cross-border project FoodPlus in which innovations in the field of precision agriculture, reduction of food waste, circular use of raw materials and energy reduction are further developed by SMEs. Accelerating the use of robotics and AI-controlled production systems in a smart fruit project.
- **Living labs & pilot facilities:** regional test gardens, pilots in precision agriculture, fermentation, soil health and circular food chains.

5. Contribution to the Netherlands & Europe

National: Smart Food Production contributes to agricultural transition, climate adaptation and food security. We are affiliated with Growth Fund projects such as ReGeNL, CAN, Biotech Booster, CropXR and NXTGEN Hightech, and play a major role in the regional NTS reinforcement plans for protein transition and those for robotics & AI for agriculture and autonomous production systems.

European: Thanks to WUR and its strong ecosystem, the East Netherlands is a partner for European food regions. Innovations from our region contribute to EU objectives relating to the Farm-to-Fork strategy and food security.

Cross-border: cooperation with German agri-food regions and participation in Interreg programmes increases scalability.

6. Ecosystem

The ecosystem is broad and diverse:

- **Knowledge institutions:** WUR, Saxion, UT, VHL, CoE Groen, regional ROCs.
- **Clusters & networks:** Foodvalley NL, StartLife, The Green East, Soil Valley, Greenport Gelderland, AI Hub East Netherlands.

- **Regional profiles:**

- o Rivierenland: avenue trees and fruit cultivation.
- o Foodvalley: food system transitions, WUR.
- o Twente: food processing industry and high-tech innovations.
- o Achterhoek: De Marke agricultural testing centre, agricultural manufacturing companies.
- o Zwolle: strong SME food sector.

7. Goals & indicators for 2030

- ≥25 test and pilot locations in use.
- Scaling precision fermentation and new crops for the market.
- ≥40 regional innovative agri- and food-technology (including biotech) SMEs finding their way into Europe and the world through new partnerships.
- Significant reduction in CO₂, water consumption and nitrogen in food chains. Specifically for nitrogen reduction in agriculture, ≥5 innovations tested in the region.

8. Investing in innovation

To further strengthen Smart Food Production, we ask for:

- **Government:** to accelerate regulations on gene editing and support the upscaling of biotechnology and precision fermentation. Support for programmes with national and international impact, such as FoodValley NL.
- **Europe:** funding via Horizon Europe, the European Competitiveness Fund (ECF) and Interreg, and a focus on food security in policy programmes.
- **Region:** pooling strengths in regional hubs and living labs, strengthening valorisation programmes (StartLife, Business Innovation Programme Food).



Appendix – Digital Industry & Technology

1. Ambition for 2030

By 2030, the East Netherlands will be known for its competitive, high-tech and sustainable industry, based on reliability, innovation and digitisation. This will strengthen our position in national and European value chains as set out in the National Technology Strategy (NTS).

Digital Industry & Technology delivers higher labour productivity, circular business models and contributes to strategic autonomy, economic earning capacity and social solutions.

Specific attention is paid to dual-use technologies, whereby civil innovations also strengthen defence. By 2030, the East Netherlands will develop into the ‘engine room of defence’, with SMEs actively contributing to security and exploiting new market opportunities.

2. Challenges & transitions

International technological competition is fierce, and countries such as the US and China are focusing more specifically on key technologies. The risk is that Dutch companies will lose market relevance and productivity. The East Netherlands sees digitisation as a solution to staff shortages and as a driver for transitions in healthcare, energy, food and security.

Key challenges:

- Application of AI, chips and digitisation in the broader SME sector.
- Cyber resilience and implementation of the AI Act and NIS2.
- Scaling up pilot projects to market introduction.

3. Impact & SDG's



Fair work & economic growth: higher productivity, more employment.



Industry, innovation & infrastructure: digitisation and key technologies in manufacturing



Responsible consumption & production: circular business models in industry.



Climate action: CO₂ reduction through digitisation and energy ICT.

4. Sub-themes & example projects

- **ChipTech:** production and application of chips and photonics via New Origin, CITC, OnePlanet Research Centre.
- **AI & data:** AI Hub East Netherlands, with a multi-year programme and 150 high-impact cases in industry, healthcare and food.
- **Cyber resilience:** Centre for Security and Digitisation (CVD), TUCCR and regional cyber ranges.
- **Fieldlabs & EDIH:** BOOST Robotics, Perron038 (Zwolle), Industrial Reality Hub (Ede).
- **Dual-use applications:** collaboration with the Ministry of Defence via regional hubs, field labs and SME suppliers.

5. Contribution to the Netherlands & Europe

National: Digital Industry & Technology makes a crucial contribution to the NTS reinforcement plans for semiconductors, autonomous systems and cyber secure by design. The sector helps to future-proof the backbone of the economy – SMEs.

European: The East Netherlands is a hub in European value chains for chips, photonics, AI and robotics. Cross-border cooperation is being strengthened through EDIHs and Interreg projects.

Cross-border: close cooperation with North Rhine-Westphalia and Fraunhofer institutes increases our effectiveness.

6. Ecosystem

- **Knowledge institutions:** University of Twente (High Tech Factory, ChipTech), Radboud University, Saxion, HAN, Windesheim, TNO.
- **Clusters & networks:** AI Hub East Netherlands, ChipTech Twente/Gelderland, Advanced Materials, High Tech NL.
- **Fieldlabs:** Perron038, ZWINC, Industrial Reality Hub, CVD, De Kien, TUCCR.
- **Companies:** broad base of manufacturing companies, semiconductor firms and start-ups in digitisation.
- **Crossovers:** links with MedTech, Food and Smart Energy increase social impact

7. Goals & indicators for 2030

- 1,000 companies NIS2-compliant (basic cyber measures).
- ≥50 chip/photonics products per year via pilot lines.
- 150 AI projects in industry, healthcare and food.
- +2 percentage point contribution of industry to GDP in the East Netherlands.
- 0.5–1.0 Mton CO₂ reduction through digitisation.

8. Investing in innovation

- **Government:** multi-year co-financing under NTS, implementation support for AI Act/NIS2, structural support for EDIH/field labs.
- **Europe:** link to Digital Europe, Horizon Europe and IPCEI Chips.
- **Region:** bundling in ChipTech East, multi-year plan for AI hub in the East Netherlands, human capital via 5,000 LLO certifications focused on AI/robotics/cyber.



Appendix – Smart Energy

1. Ambition for 2030

The East Netherlands is the cradle for the integration of energy systems and, with that, the energy grid of the future. Having worked on the development of decentralised systems (Smart Energy Hubs) in recent years, we are now taking the next step: system integration.

In 2030, we will demonstrate how batteries, hydrogen, heat, charging infrastructure and digital systems can be intelligently combined in robust networks. This will enable us to resolve grid congestion, make energy available and affordable, and strengthen strategic autonomy and competitiveness. The East Netherlands provides solutions that can be applied locally and scaled up nationally and across Europe.

2. Challenges & transitions

The energy transition needs to be sped up:

- From grey to green (greening generation).
- From centralised to decentralised (local production and hubs).
- From scarce and expensive to available and affordable (energy affordability).
- From dependent to self-sufficient (autarkic networks).

Urgent challenges include grid congestion, rising energy costs, and geopolitical dependence on fossil fuels.

3. Impact & SDG's



Affordable and sustainable energy: accelerating the energy transition.



Industry, innovation & infrastructure: robust energy system.



Sustainable cities & communities: energy security and liveability.



Responsible consumption & production: circular energy chains.



Climate action: CO₂ reduction through smart integration.



Partnerships: ecosystem approach and public-private collaboration.

4. Sub-themes & example projects

- **Tackling grid congestion:** National Expertise Centre for Grid Congestion (Connectr, Arnhem).
- **Smart Energy Hubs:** started in the East Netherlands, now a national programme. We want to have 60 smart energy hubs in the East Netherlands by 2030.
- **Battery storage:** Twente Centre for Advanced Battery Technology (TCABT), affiliated with Fraunhofer and Münster.
- **Hydrogen:** H2EART project, green hydrogen ecosystem for the East Netherlands and Münsterland.
- **Advances GDSs:** Ecofactorij Apeldoorn (first closed distribution system with Liander).
- **FLECS initiative:** collaboration between UT, TenneT and Alliander on cyber-secure energy systems.

5. Contribution to the Netherlands & Europe

National: The East Netherlands provides scalable solutions for grid congestion, Smart Energy Hubs and system integration. This is in line with the **Multi-year Programme for Energy and Climate Infrastructure (MIEK).**

European: as a testing ground for integrated energy systems, we are strengthening energy security and affordability in Europe. Innovations from the East Netherlands are being scaled up through Interreg

projects and cross-border collaboration

Cross-border: collaboration with North Rhine-Westphalia, Fraunhofer and universities in Münster ensures knowledge exchange and joint scaling up.

6. Ecosystem

- **Knowledge institutions:** University of Twente (CEI, TCABT, EDGE Centre), Saxion, Windesheim, HAN/SEECE, RU, WUR.
- **Companies & clusters:** battery and hydrogen companies, engineering firms, SMEs in energy technology.
- **Networks:** Connectr, regional energy communities, business parks as living labs.
- **Cross-border partners:** H2EART, Interreg GEMS and STEPS.

7. Goals & indicators for 2030

- **60 Smart Energy Hubs** realised in the East Netherlands (500 nationwide).
- **≥10 integrated system demonstrations** operational.
- **Working digital twin** for congestion management.
- **Substantial CO₂ reduction** through electrification and flexibility.
- **Closed distribution systems (GDS)** applied and proven.

8. Investing in innovation

- **Government:** structural funding within nMIEK/ pMIEK for decentralised infrastructure and recognition of the Network Congestion Centre.
- **Europe:** investments via ECF and Horizon Europe, with a focus on first ready-first served rather than first come-first served.
- **Region:** scaling up of Smart Energy Hubs, Battery Competence Cluster and business parks.

Cooperation via **NTS Smart Grids** and **NTS Batteries** is crucial. TEN partners are working on a joint action agenda with concrete projects and investment questions.

Appendix – Circular

1. Ambition for 2030

The Netherlands aims to be 50% circular by 2030 and fully circular by 2050. The East Netherlands is demonstrating that this is not only good for the environment, but also for broad prosperity and economic earning capacity. We are building circular chains in four sub-themes: manufacturing, plastics, textiles and construction.

Our ambition is for companies in the East Netherlands to become circular themselves and for the knowledge and innovations that arise here to be applicable elsewhere in the Netherlands and Europe. In this way, we are contributing to a new economic model in which reuse, redesign and new materials are central.

2. Challenges & transitions

The transition from linear to circular touches on several urgent issues: scarcity of raw materials, CO₂ reduction, energy-intensive production and geopolitical dependencies. For SMEs in the East Netherlands, this is both a challenge and an opportunity to develop new markets.

3. Impact & SDG's



Fair work & economic growth: circular chains create new jobs.



Industry, innovation & infrastructure: circular manufacturing industry, plastics and textile chains.



Responsible consumption & production: extending product lifespans, innovative recycling and biobased solutions.



Climate action: reduction of CO₂ and raw material use.



Partnerships: chain cooperation in the region and Europe.

4. Sub-themes & example projects

- **Smart manufacturing industry:** manufacturing companies are working on circular production and new business models (Fieldlab Circular Innovations, Cinergie). AI and data are playing an

increasingly important role. Potential: €666 million in additional value per year and 483,000 tonnes less CO₂.

- **Plastics:** The East Netherlands has the entire plastics chain, from collection to recycling and production. Examples: Polymer Science Park, TPRC and TPAC. Innovations focus on biobased plastics, mechanical, chemical and enzymatic recycling and comply with EU blending standards (30% in 2030).
- **Textiles:** a strong history and future. Innovations in recycling (Frankenhuis, SaXcell), sustainable yarns (Spinning Jenny, Enschede Textielstad), and new business models such as repair and reuse. The circular textiles roadmap connects producers, designers and sorters.
- **Construction:** circular construction with biobased materials from agriculture, such as flax and hemp. Examples: Pioneering (200+ companies), Plantics and Miscancell (biobased building materials), Omlab, Krimppp and The Green East.

5. Contribution to the Netherlands & Europe

National: The East Netherlands provides roadmaps for textiles, plastics and biobased construction that can serve as a model for the whole country. The circular manufacturing industry strengthens SMEs and contributes to climate goals.

European: our region is an exporter of circular knowledge and technology, from plastics recycling to biobased construction. Cross-border cooperation with Germany and participation in EU networks such as Vanguard increase scalability.

6. Ecosystem

- **Knowledge institutions:** University of Twente (circular manufacturing), Saxion (textiles, biobased), WUR (agrifood & biobased), HAN (biocentre), Windesheim (plastics & manufacturing).
- **Clusters & networks:** Polymer Science Park, DCPV, The Circular Rubber Platform, Pioneering, KRIMPPP, regional alliances with >100 companies.
- **Companies:** ranging from Apollo Vredestein, Wavin and DSM to circular pioneers such as RPP Kunststoffen, Timmerije, Leadax, Korrels, Spinning Jenny, Interface and Enschede Textielstad
- **Cross-sectorale strength:** links with agriculture (fibre crops), plastics and digitisation.

7. Goals & indicators for 2030

- 3 regional roadmaps active (plastics, textiles, construction).
- 10 large-scale projects.
- >20 living labs and hubs operational.

8. Investing in innovation

- **Government:** national standards (plastics/textiles), acceleration of biobased construction (NABB), and support for SMEs in circular business models. Support for shaping circular product chains.
- **Europe:** programmes within ECF and Horizon, mainly focused on circular materials and chains. Programmes to shape and scale up circular product chains.
- **Region:** strengthening networks and hubs, focus on practical research and training in new materials.

In addition, long-term financing instruments are needed for new chains, as well as pilots with alternative revenue models (such as circular construction contracts and extended producer responsibility, return flow utilisation, and service life extension).



Appendix – Defence & Dual use Technology

1. Ambition for 2030

By 2030, the East Netherlands will be a leading development and testing region for dual-use and defence technology within Europe. We are building on the region's strong high-tech and manufacturing industry and developing solutions that can be used for both civilian and military applications.

Our ambition is clear: a 10% annual increase in dual-use innovations in co-creation with SMEs, knowledge institutions and the Ministry of Defence. In doing so, we will strengthen the strategic autonomy of the Netherlands and Europe and create new economic opportunities for the East Netherlands.

The East Netherlands supplies core technologies that are crucial for security, critical infrastructure and European resilience: AI & data, sensors, photonics, chips, robotics, autonomous systems, cybersecurity, advanced materials and digital twins. The region is thus developing into the 'engine room of the Ministry of Defence', a place where innovation, production and chain cooperation come together.

2. Challenges & transitions

The security situation in Europe is changing rapidly. At the same time, demand for high-quality technology for defence and civil security is increasing. Three transitions determine the urgency:

Security & strategic autonomy: Europe wants to be less dependent on foreign technology. Key technologies must be designed, built and applied in Europe.

Dual-use innovation & application: The boundary between civil and military is blurring: autonomous systems, AI, chips, energy infrastructure and cybersecurity are essential in both domains. Innovation chains must become more flexible and scalable.

Chain renewal & access for SMEs: SMEs experience barriers to accessing defence markets: information provision, ABDO requirements, late payments, unfamiliarity with OEMs and lack of insight into demand articulation.

The challenge is to link these transitions to the existing high-tech ecosystem in the East Netherlands, thereby connecting companies, the Ministry of Defence and European partners to joint development agendas.

3. Impact & SDG's

The theme Defence & Dual Use Technology contributes to several Sustainable Development Goals:



Valuable work & economic growth:

growth of high-tech SMEs, new chains, exports and employment.



Industry, innovation & infrastructure:

development of key technologies for security, resilience and high-quality production.



Sustainable cities & communities:

application of dual-use technology (e.g. sensors, energy robustness, cybersecurity)



Peace, security & strong public institutions:

technologies for the protection of citizens, infrastructure and democratic values.



Partnerships:

close public-private cooperation with Defence, regions, Germany and Europe.

4. Sub-themes & example projects

- **Autonomous systems & unmanned technology:** drones, UGV/USV platforms, anti-drone systems, sensors and command & control. **Example project:** East Netherlands Anti-Drone Test Site – integrated testing ground for detection, interception and scenario testing for civil and defence use.
- **(Opto)photonics, chips & sensor technology:** core technology for radar, situational awareness and secure hardware. **Example project:** secure Hardware Pilotline – accelerating design-production-testing for European reliability. Chips and photonics.
- **AI, data & digital security:** AI applications for analysis, autonomy, cybersecurity, digital resilience and NIS2 implementation. **Example project:** AI for Security Lab – SME hub for AI

applications in security, surveillance, digital threat detection and dual-use data spaces.

- **Materials, (additive) manufacturing & maintenance:** new materials, metal and composite printing, smart production and maintenance systems. **Example project:** Rapid Deployment Manufacturing Hub – rapid production capacity for critical components in the civil and defence domains.
- **Digital simulation & training (digital twins):** virtual environments for security, logistics and asset management. **Example project:** Digital Twin for Infrastructure Security – demonstration environment for the protection of energy, water and transport networks.

5. Contribution to the Netherlands & Europe

National: Supports objectives in the Defence Industry Strategy (DIS) and NTS reinforcement plans (chips, cybersecurity, autonomous systems). Increases the resilience of critical infrastructure (energy, water, logistics). Expands SME access to the defence market and launching customership. Links high-tech innovation directly to national security needs.

European: Fits in with European priorities around strategic autonomy, dual-use technology and security (EDF, Horizon Europe, DG DEFIS). Contributes to EU chains for semiconductors, photonics, AI, robotics and cyber-secure systems. Strengthens cross-border cooperation with Germany (NRW, Fraunhofer, Münster). Offers scalable testing and demonstration projects that connect European regions.

6. Ecosystem

The ecosystem for Defence & Dual-use Technology is broad and strong, with consistently visible clusters:

- **Knowledge institutions:** University of Twente (High Tech Factory, Robotics, ChipTech), Radboud University, Saxion, HAN, Windesheim, WUR.
- **Clusters & networks:** AI Hub East Netherlands, ChipTech Twente/Gelderland, OnePlanet, CITC, Industrial Reality Hub, Perron038, CVD/TUCCR, Connectr.
- **Companies:** high-tech SMEs, semiconductor companies, sensor and radar companies, cybersecurity scale-ups, drone and robotics companies, materials and manufacturing industry.

- **Field labs & test facilities:** BOOST Robotics, TUCCR cyber ranges, test locations for UAV/ anti-UAS, digital twin labs, composite labs and battery systems.
- **Cross-sector strength:** strong links with Digital Industry, Smart Energy and MedTech create new dual-use opportunities.

7. Goals & indicators for 2030

- +10% more dual-use innovations per year from co-creation
- ≥150 companies active in dual-use innovation programmes
- ≥20 new demonstrators (anti-drone, sensing, AI, production lines, digital twins)
- ≥1.000 SMEs NIS2-ready (linked to cybersecurity transition)
- ≥10 European partnerships (EDF projects/Interreg/Horizon Europe)
- Growth of the regional defence market from €1.5–2 billion to €7.5–10 billion (with equal market share)
- Measurement methodology via annual monitoring + ecosystem data.

8. Investing in innovation

Government

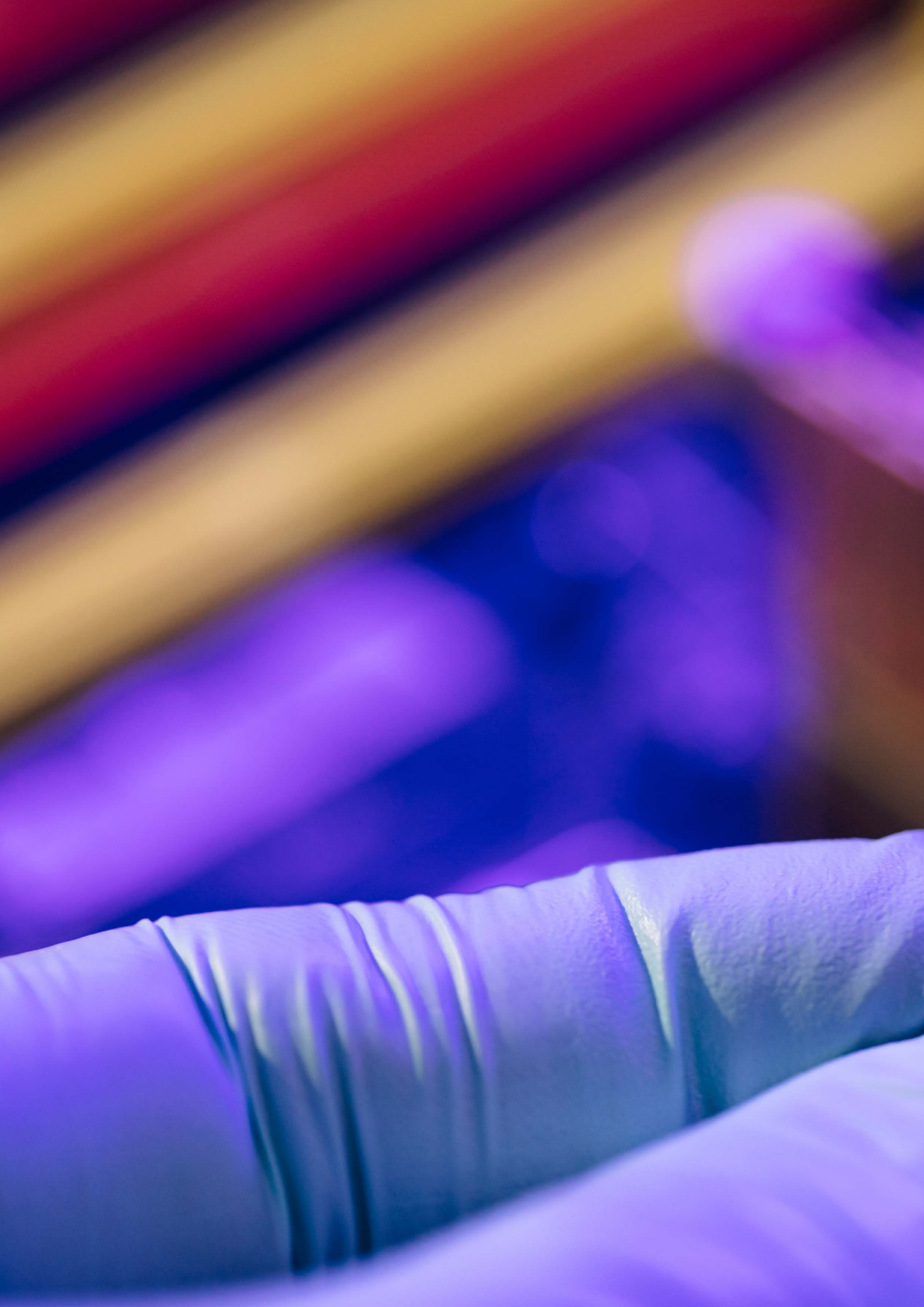
- Integrated support within DIS and NTS (autonomous systems, cyber, semicon).
- Funding for test facilities, ABDO support and acceleration of demand articulation.
- Launching customership and accelerating procurement chains for SMEs.

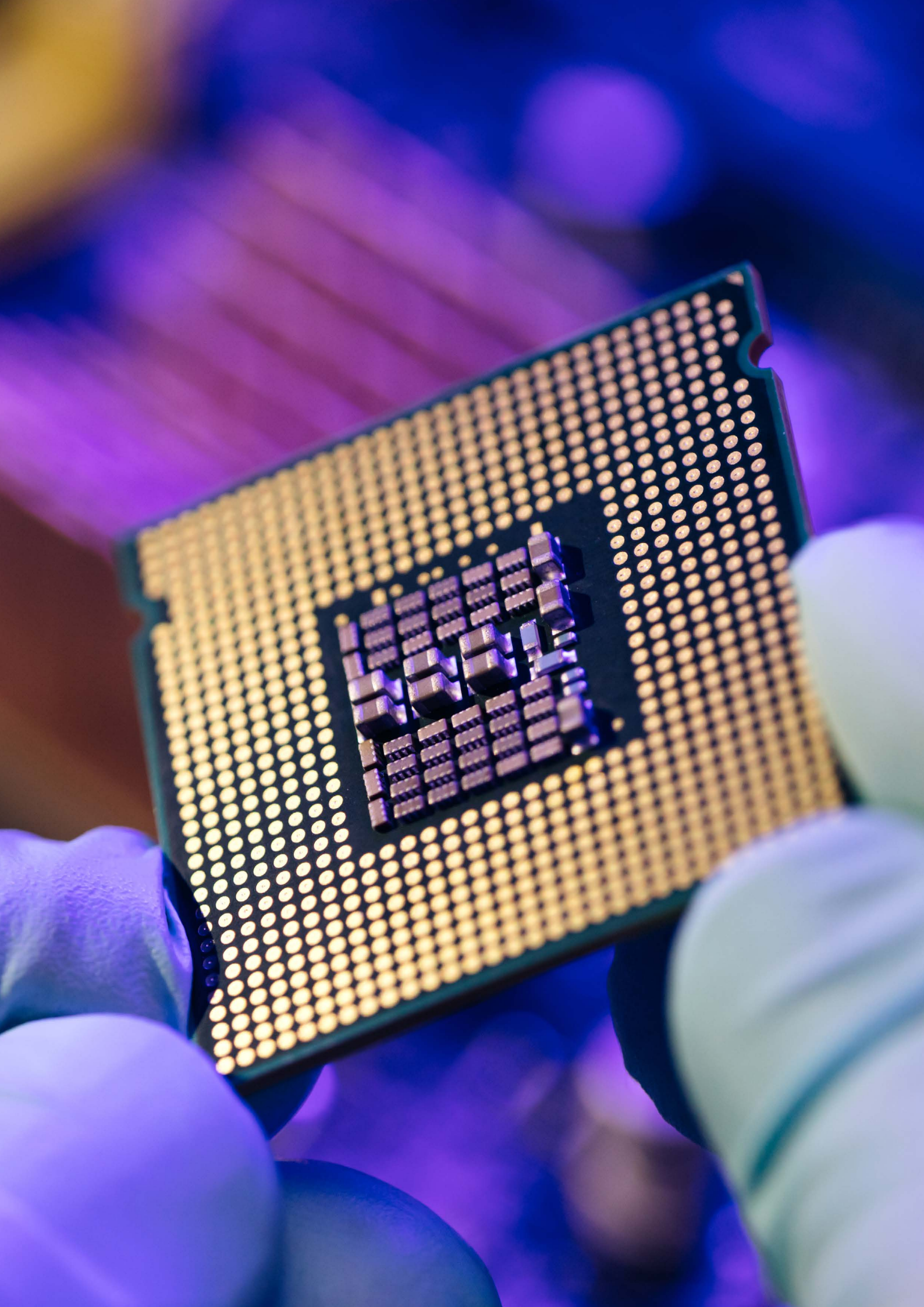
Europe

- Access to the European Defence Fund (EDF) and Horizon Europe security/dual use.
- European pilot lines for chips, photonics, AI and secure hardware.
- Cross-border programmes with North Rhine-Westphalia, IJssel-Vecht Delta and Euregional hubs.

Region

- Expand regional field labs (robotics, cyber, sensors, testing).
- Support venture development for dual-use start-ups.
- Human capital programmes for AI, robotics, cyber and systems engineering.







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