

January 31, 2024

The Dutch Semicon and Integrated Photonics Industry

Semicon Korea 2024

 Share innovation. Shape tomorrow.



High Tech NL

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Share innovation. Shape tomorrow.

SEMICON® KOREA

Jan 31 - Feb 2, 2024



High Tech NL community

- Founded in 2013 as an independent community with a national overview and role
- Umbrella organization with a national focus
- Well over 240+ member companies, covering many areas and segments
- Thought leadership, focus & support for 'common interest groups'
 - **Cluster Semiconductors** (100+ companies and institutes & covering all steps in the process)
 - Other clusters: Robotics - Lifescience Technologies - Energy Systems
- Support cooperation, partnerships and international focus



The Dutch semiconductor industry & opportunities

- Our history and what bonds us?
- Facts and figures
- The Dutch semiconductor industry and running programs
- Where can we grow together and what will help us?



WHY?

START
HOW GREAT LEADERS INSPIRE EVERYONE TO TAKE ACTION
WITH
READ BY THE AUTHOR SIMON SINEK
WHY



The Golden Circle

WHAT

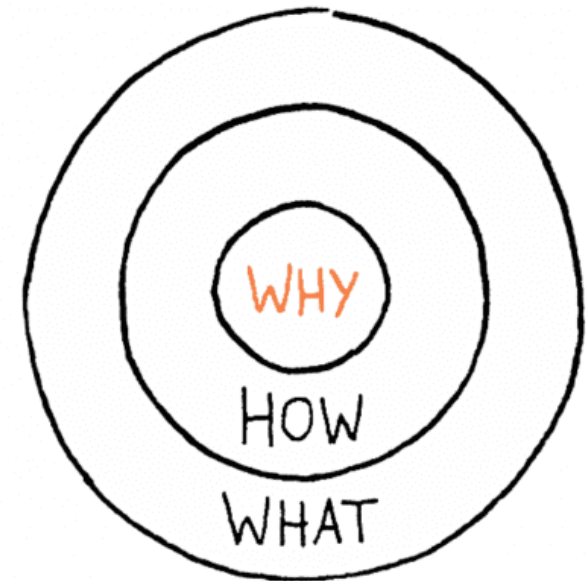
Every organization on the planet knows WHAT they do. These are products they sell or the services

HOW

Some organizations know HOW they do it. These are the things that make them special or set them apart from their competition.

WHY

Very few organizations know WHY they do what they do. WHY is not about making money. That's a result. WHY is a purpose, cause or belief. It's the very reason your organization exists.



What bonds us



Overall comparison

South Korea vs. the Netherlands



- South Korea
- Population: 51 million
- Total size: 100,363 km²



- The Netherlands
- Population: 18 million
- Total size: 41.543 km²





The Netherlands

Superior Logistics & ICT Infrastructure

According to the 2019 WEF Global Competitiveness Index on infrastructure, NL is:

#1 in Europe

#2 globally

- Port of Rotterdam: Europe's largest and most important harbor
- Schiphol Airport: Europe's best airport for cargo & passengers
- Excellent infrastructure of roads, highways, railways and waterways
- Top-5 position in ICT infrastructure (according to the World Economic Forum)
- Dutch Customs Authorities: practical and pro-active approach
- VAT deferment at time of import





Mutual business for our countries (2022 figures)

- Over 140 entities of Korean companies in the Netherlands
Brings jobs to about 3,000 people
- Mutual business (2022 data - source, CBS the Netherlands)
Export from NL to Korea: 10.3 billion EUR (↑8.4% vs. 2021)
Export from Korea to NL: 5.8 billion EUR (↑30% vs. 2021)
- Korean support entities present in the Netherlands
 - KOTRA
 - Korean Embassy
 - Two Korean business associations
 - Service Providers (fiscal, accounting, logistics)
 - Korean Chamber of Commerce established in 2023





Korean companies in the Netherlands





Official visit of President Yoon Suk Yeol

- Visit 12 & 13 December 2023
- First official visit of a South Korean president to the Netherlands, official relationship running since 1960
- Since 2022 signed 'Strategic Partnership' with focus on safety, politics, economics, culture
- Visit to ASML headquarters, Veldhoven
- ASML and Samsung Electronics signed a \$760M memorandum of understanding to establish an EUV process technology research center in South Korea (the first overseas R&D site)

Source: <https://bits-chips>

- Multiple other MoU's signed, for instance Doosan Robotics and Schiphol International Airport





Mutual policy and CEO Round Table

- Joint statement by President of South Korea Yoon Suk Yeol and King of the Netherlands Willem-Alexander van Oranje
- Both leaders recognized their unique and complementary position in the semiconductor value chain and reaffirmed their commitment to build a semiconductor alliance encompassing the participation of governments, businesses, and universities.
- In this vein, the two leaders agreed to establish a bilateral semiconductor dialogue and a Semiconductor Talent Program, and to continue and expand business-to-business cooperation.



Source: [Joint statement between the government of the Republic of Korea and the government of the Kingdom of the Netherlands](#) | [Diplomatic statement](#) | [Government.nl](#)

Semiconductors NL overview

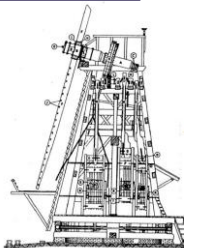


NL high tech history

- Over 400 years of history
- Many global players and champions
- Semiconductor industry about 70 years old
- Even today: no single company masters all steps necessary to design, package, produce and test a complete device
- Develop a chip? It takes 60 countries & 800 process steps
- **Cooperation is not a choice... it's a must!**

We have a long history of innovations...

Innovation	Year
Microscope	1590
Crankshaft	1594
First submarine	1620
First electric vehicle	1835
Electrocardiography (ECG)	1903
Artificial kidney	1943
Automatic transmission (CVT)	1958
Compact disc	1979
Wifi	1991
Bluetooth	1994
Tom Tom navigation	2004





Philips Electronics, founding father

- Founded in 1891
- Unique role and scope:
 - Development of technology
 - Basis for new products
 - Design & build the necessary equipment
 - Stimulate innovation and growth
- By 2023 dozens of individual companies, for instance: NXP, ASML, VDL ETG, ASM PT, KNS and ITEC
- Still strong bonds towards the semiconductor sector





Top NL semiconductor company

The global #1 in lithography equipment

- Our well-known flagship, founded in 1984
- Unique leader and partner within NL ecosystem
- Over 40,000 employees globally

ASML

How about the entire business cluster?



Key figures semiconductors in the Netherlands

- 350+ companies within a range of 200 kilometers (or 124 miles)

Within NL
Globally

over 50,000 employees
85,000 employees (and families)

- 75% Dutch owned – 25% foreign owned (mainly USA and Germany based)
- 2021 global sales revenue € 39+ billion (4.3 % of Gross National Product)
- 85% of all chips manufactured makes use of 'Made in NL' equipment
- Semiconductor sectors:
 - ✓ Metrology & inspection
 - ✓ Equipment & components
 - ✓ IC Design & Design Tools
 - ✓ Raw materials & components
 - ✓ Pure play foundry
 - ✓ Assembly & packaging
 - ✓ Integrated device manufacturer
 - ✓ Services

THE MAIN SEGMENTS IN OUR SUPPLY CHAIN

Strengths of the Netherlands



Semicon Equipment

45+ companies
Leading positions :

- (EUV) lithography
- Atomic Layer Deposition
- Advanced packaging
- Heterogenous Integration
- Metrology: scanning Probe Microscopy
- Dicing & Packaging



2021 values

- Euro 22 bln revenu
- 43,000 FTE



Equipment Components

50+ companies
Leading positions :

- Positioning systems
- Mechatronics
- Environmental conditioning
- Metal – glass - ceramic components
- Particle beam
- Laser technology



2021 values

- Euro 3,4 bln revenue
- 10,500 FTE



Chip Design

60+ companies
Focus towards:

- Analogue chips
- Compound material:
 - GaN GaAs Sic etc
- Strengths:
 - Radar, LiDAR, NFC
 - Power electronics
 - Integrated photonics
 - Quantum computing
 - Amplifiers, antennas
 - Telecom 5G/6G
 - Aerospace & Defense
 - Automotive



2021 values

- 1,100 FTE

Ambitions & opportunities



European ambition and opportunities



- **European Chips Act says:**
“ Grow towards 20% global market share by 2030”

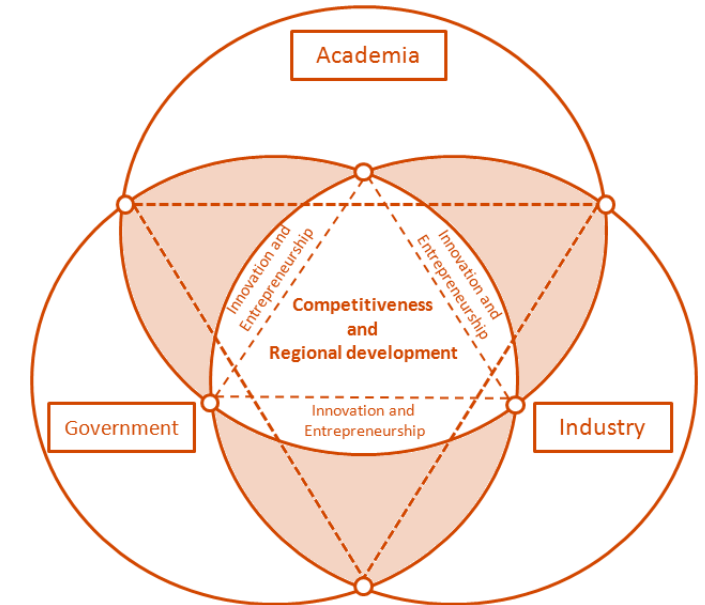
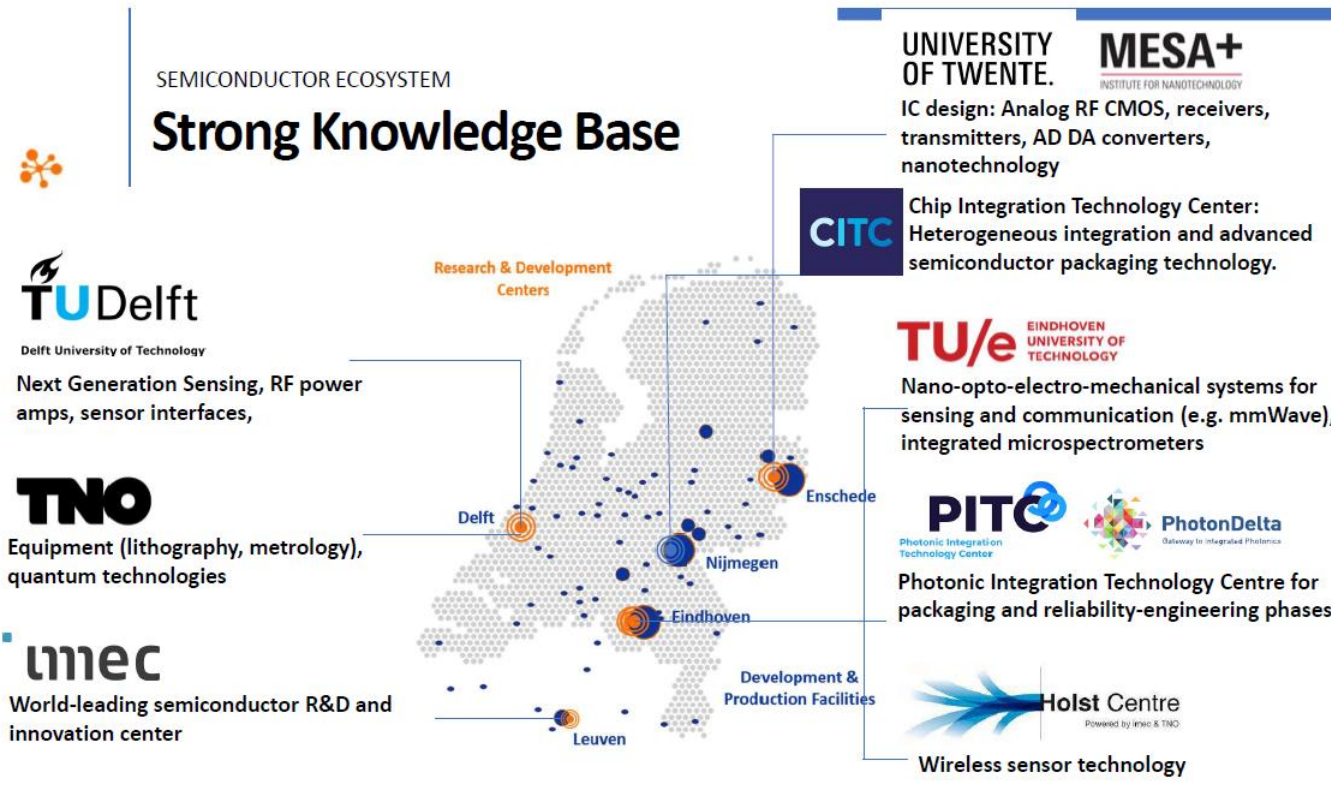
Huge investments:

- Means chances for industry and suppliers (NL and Korean)
- Globally active equipment sector
- Large and growing Chip Design community

Opportunities for:

- Production locations and increase of semiconductor output
- OSAT activities (within NL borders)
- Students and researchers, increase of staff

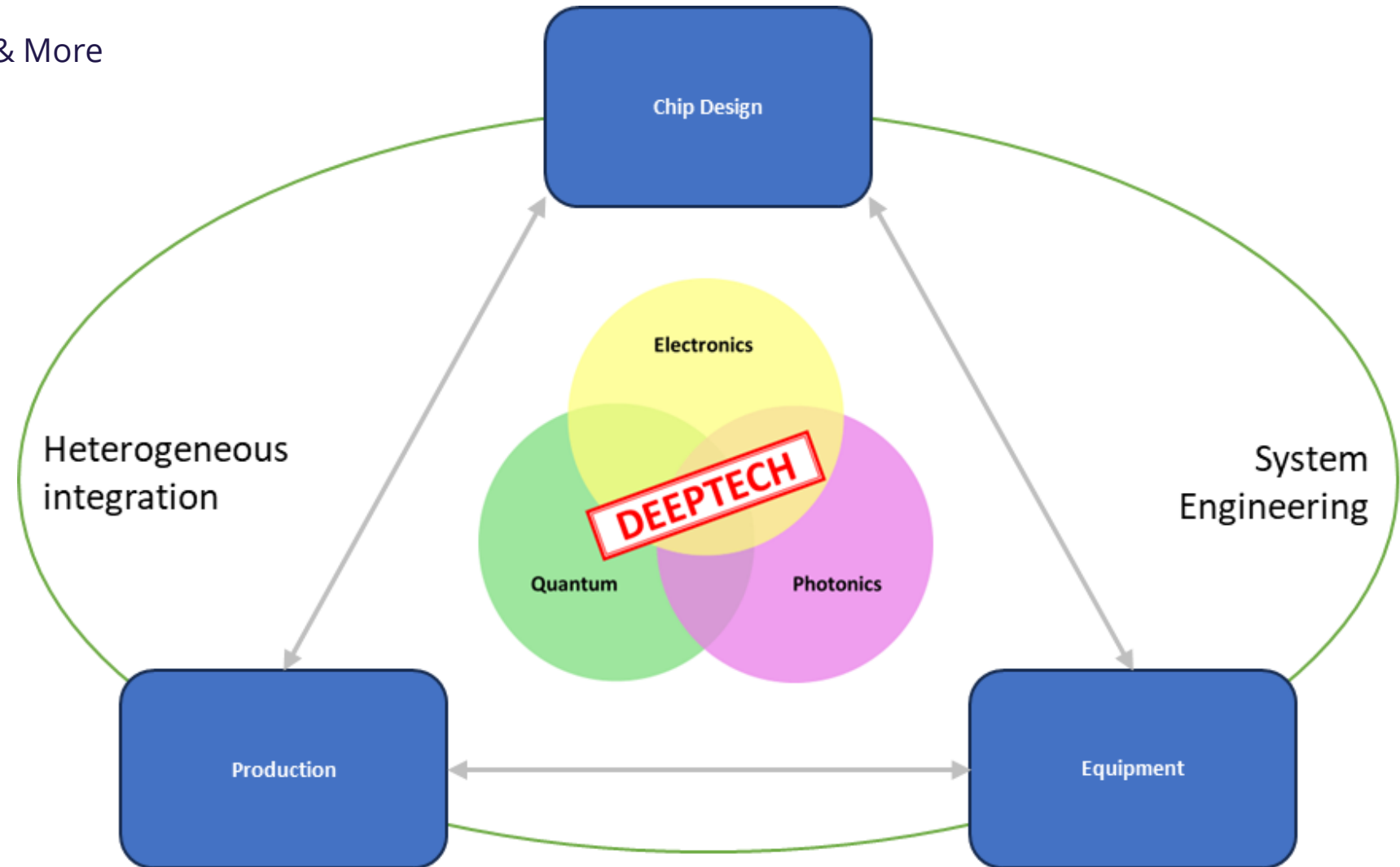
Collaboration NL government / universities / companies



Triple Helix approach

2024 and beyond focus topics within NL:

- ✓ Chip Design; More Moore & More than Moore
- ✓ Wafer Fab Equipment
- ✓ Advanced packaging and heterogenous integration
- ✓ Metrology Equipment





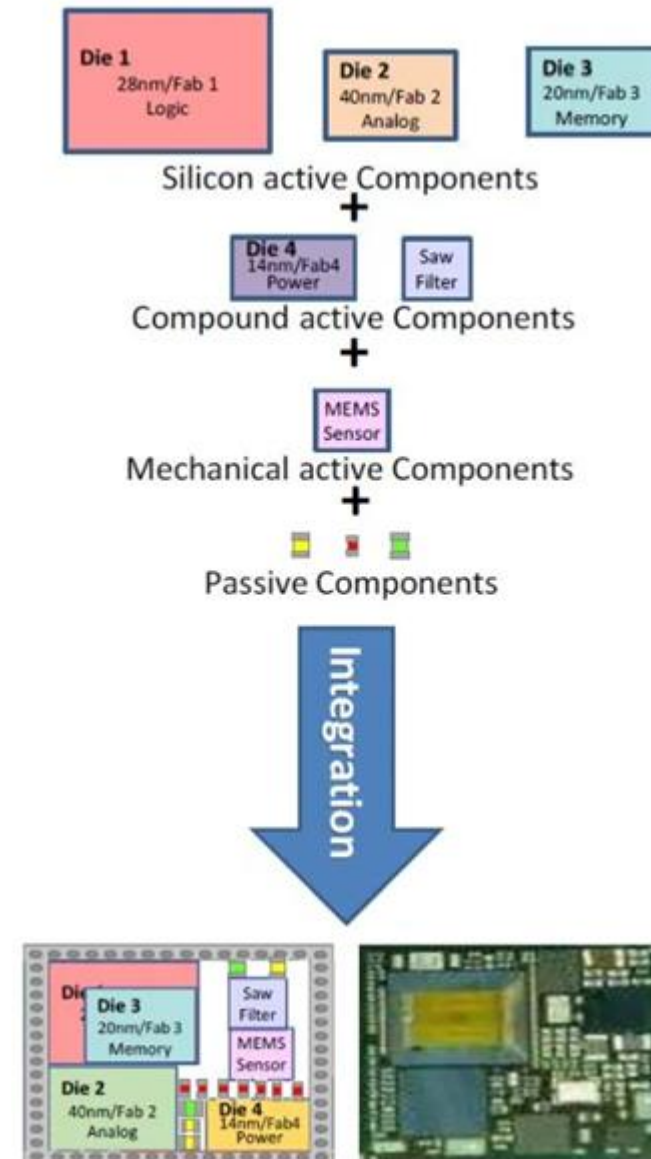
NXTGEN HighTech program

- According to Semi.org https://www.semi.org/en/communities/heterogeneous_integration_roadmap

“Heterogeneous Integration refers to the integration of separately manufactured components into a higher-level assembly or system in package (SiP) that in the aggregate, provides enhanced functionality and improved operating characteristics “

- **Why?**

Market asks for smaller, faster & more energy efficient systems

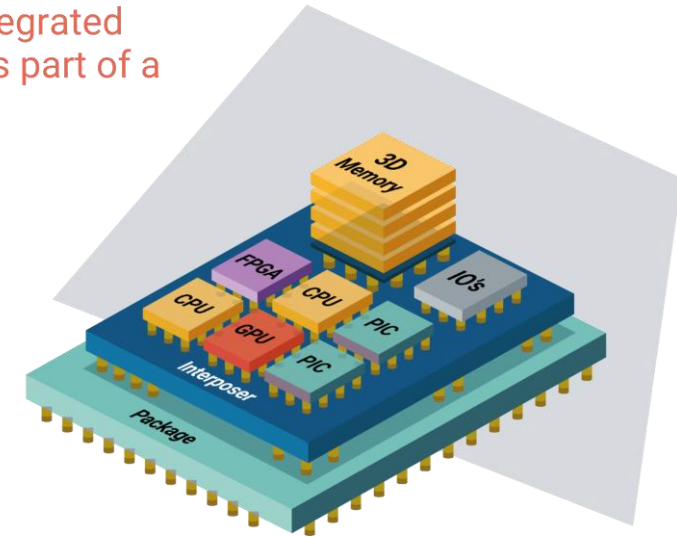




NXTGEN HighTech program

- 7-year program, total value 1 billion Euro (including 450 million government support)
- Strong future for Photonic IC's , the Netherlands holds a strong position and vast ecosystem
- We unite knowledge from semiconductors and combine for new challenges:
 - Packaging & design
 - Metrology
 - Interface electronics design
 - Volume increase production
- Benefit from 65 years semiconductor experience
- Partner with likeminded communities & countries

A Photonic Integrated Circuit (PIC) as part of a system





Semicon winterprogram, February 2024



- Organized by Technical University Eindhoven 'High Tech Systems Center' in partnership with:
 - ASML
 - ASM
 - The Korea Semiconductor Industry Association
 - The Korea Institute For Advancement of Technology
 - Samsung
 - Brainport Development
- Signing took place at ASML HQ during a visit by South Korean President Yoon Suk-yeol and King Willem-Alexander
- Winter Academy will target top talent from South Korea and the Netherlands with a world-class program



International partnership program



Research and innovation



What is Horizon Europe?

Horizon Europe is the EU's key funding program for research and innovation with a budget of € 95.5 billion (2021 to 2027)

Facilitates research and innovation collaboration worldwide, including the Republic of Korea

Areas of interest (among others):

- ✓ manufacturing technologies
- ✓ key digital technologies including quantum technologies
- ✓ emerging enabling technologies
- ✓ advanced materials
- ✓ artificial intelligence and robotics



International partnership program



Eureka program has 2 objectives:

1. Boosting economic growth by stimulating technological cooperation between companies
2. Devising and implementing joint solutions for economic, strategic and social issues.

Open for partnerships with NL based entities (SME's, research partners, universities and more)

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Source: [Eureka: program international R&D](#)



Recent collaboration success stories

I

Drone-based platform delivers critical support to first responders



In disaster situations, emergency teams can be hampered by confusion and a lack of communication. To address this, EU-funded researchers have developed new drone-based technology that provides situational awareness in real time. This will give first responders valuable information that can save lives.

Cultivating the Internet of Things in farming



Cloud-supported control of pests, data-empowered precision in the use of water and nutrients, remote monitoring of milk quality... Smart webs of connected objects are opening up new possibilities to boost productivity and sustainability in agriculture. EU-funded researchers are trialling Internet of Things solutions for farms and food.

Speeding up the search for tuberculosis vaccines



An EU-funded project aims to identify and maximise the potential of novel vaccines to end the global tuberculosis epidemic. These could save lives, stem the spread of infection and shorten treatment for the often deadly, airborne disease.

Source: [All success stories](#) | [Research and Innovation \(europa.eu\)](#)



Recent collaboration success stories

II

Intellian Technologies Inc.



Korean satellite communications leader [Intellian](#) established its new European Headquarters and Global Logistics Center in Rotterdam, the Netherlands, underpinning a long-term commitment to the region. The new facility more than triples Intellian's business footprint in Rotterdam and will further enhance the service and user experience of the company's partners and customers, both in Europe and beyond.

Intellian has had offices in the Netherlands since 2011, being active in the Dutch High tech systems ecosystem. With the landmark investment in major Dutch port city Rotterdam, Korean manufacturer Intellian has secured ownership of a key location within Europe's center of commerce for maritime, ideally positioning the company to further strengthen its focus on achieving the highest levels of customer service in the years ahead .

Lunit Inc.

Lunit is a medical AI software company devoted to conquering cancer and advancing medical intelligence. It develops and provides AI-powered solutions for cancer diagnostics and therapeutics that can save time and save lives .



Lunit established its European base for sales and marketing in Almere, the Netherlands in early 2020.

Chris Land, VP of Europe Sales for Lunit, said the Netherlands was the only prospective European location on the shortlist. 'We chose the Netherlands as our European base because of the strategic location, large start-up scene, strong medical research and focus on innovation. So, together with head office in Seoul, we decided on 't Harde and didn't consider any alternative locations in Europe.'

Land said that the 'luminary' character of the University Medical Centers (UMCs) in the Netherlands could aid Lunit in the future once it starts conducting more research and has its AI products installed at reference locations. This installed base, in turn, will assist expansion into other European territories.

Source: [All success stories | Research and Innovation \(europa.eu\)](#)



Recent collaboration success stories

III

CJ CheilJedang Corp.



South Korea's food to entertainment conglomerate CJ Group acquired Batavia Biosciences in 2021.

Batavia has its headquarters and a GMP facility in Leiden, the Netherlands and the company is a CDMO which specializes predominantly in viral vaccines and viral vector products. It also has capabilities for monoclonal antibodies (mAbs) and recombinant protein development. Batavia helps its customers with the development of a production process that meets Good Manufacturing Practice (GMP) standards.

Through the acquisition of Batavia Biosciences, CJ plans to advance into global gene therapy CDMO market to expand its red biotechnology business portfolio.

CJ will invest more than 100 million euros (about 132 billion won) in new manufacturing plant. The new plant will be built in Leiden Bioscience Park in the Netherlands. Six production lines will be built at this factory. It plans to manufacture vaccines, gene therapy drugs, and immunotherapy drugs for cancer.

Hyosung Heavy Industries Co., Ltd.



Hyosung Heavy Industries is engaged in various areas of construction, including the areas of housing, redevelopment and reconstruction, business and commercial facilities, civil engineering and environment, and SOC.

Hyosung has been thinking of adding R&D center to test circuit breakers and switches for high voltage grid and they recently set it up in Arnhem, the Netherlands where KEMA (KEURING VAN ELECTROTECHNISCHE MATERIALEN) is located.

KEMA provides testing and certification services, energy consultancy, engineering and technology consulting for the electricity sector worldwide. The R&D center will be working within the area of consulting, research and development, mainly in the field of electrical energy technology. Hyosung likes to keep a close contact with academies such as HAN university in Arnhem to hire talents for the R&D center to develop new technologies.

On top of the R&D center, they consider adding more activities, EHQ, manufacturing, EDC, etc., in future.

Source: [All success stories](#) | [Research and Innovation \(europa.eu\)](#)



How to connect with the Netherlands?

- The Netherlands Foreign Investment Agency (NFIA) is a powerful global network
- 11 locations in the Netherlands
- Local presence in Seoul and contacts all over South Korea





NETHERLANDS FOREIGN INVESTMENT AGENCY & NETHERLANDS INNOVATION AGENCY



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감사합니다 **Thank you**

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Together we create difference

Thank you for your attention



High Tech NL

Robotics



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Life Sciences



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Energy