

TNO innovation
for life



Arnaud de Jong

Managing Director TNO High Tech Industry



**The innovation race:
Lead, or be left behind**



The image depicts a futuristic digital display showing a city model with various climate change impact data overlays. The display is interactive, with people in white lab coats and a woman in a yellow cardigan pointing at the data. The background is a dark blue wall with a cityscape and a rain effect. The data overlays include:

- 33°C (Temperature)
- BUILDING DAMAGE
- ROAD NETWORK FUNCTIONALITY (40%)
- SOIL SUBSIDENCE (G43-3 E77 E35)
- PRECIPITATION DEFICIT
- SUB SURFACE ACTIVITIES
- STREETS
- ROADS
- RAILWAYS
- WATER
- ENERGY
- INDUSTRY
- TRANSPORT
- LAND USE
- ENVIRONMENT
- INFRASTRUCTURE
- CLIMATE
- RISK

Climate change forces society to adapt.



Peace is no longer a given.



AI is changing the rules of the game.

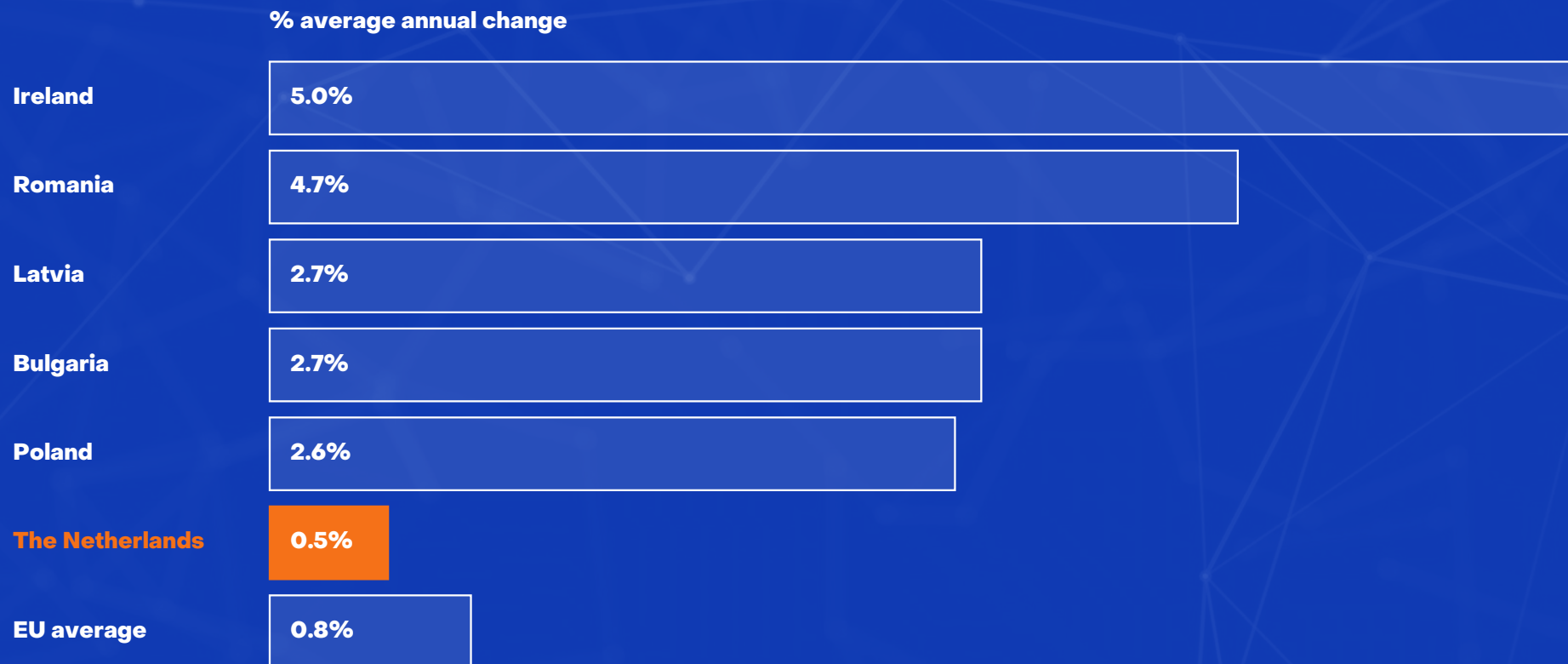


”

If Europe cannot become more productive, we will be forced to choose. We will not be able to become, at once, a leader in new technologies, a beacon of climate responsibility and an independent player on the world stage.

— Mario Draghi

Dutch productivity growth is lagging



Productivity Dutch high-tech

Gross annual added value per employee in Dutch high-tech industry

The Netherlands

€187.833

United States

€186.827

Belgium

€176.138

France

€134.012

United Kingdom

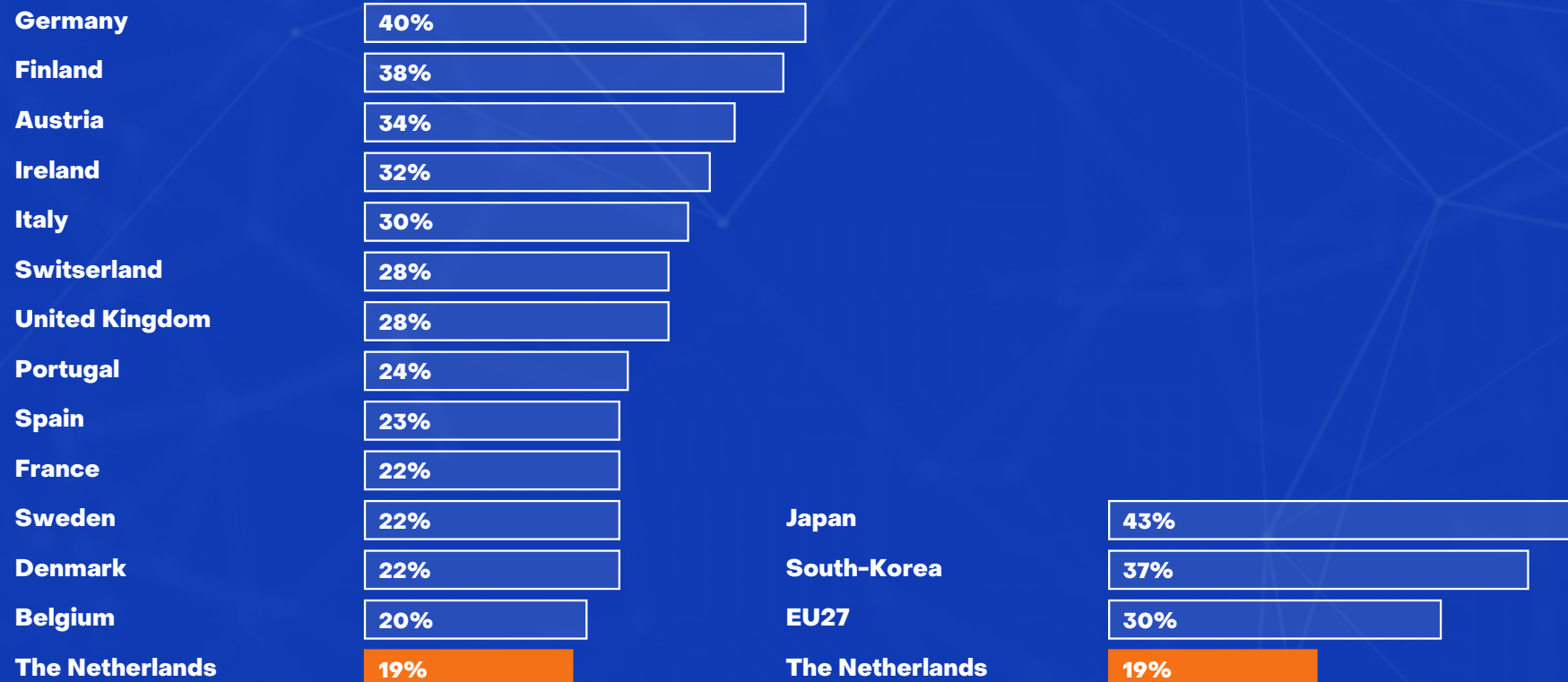
€132.597

Germany

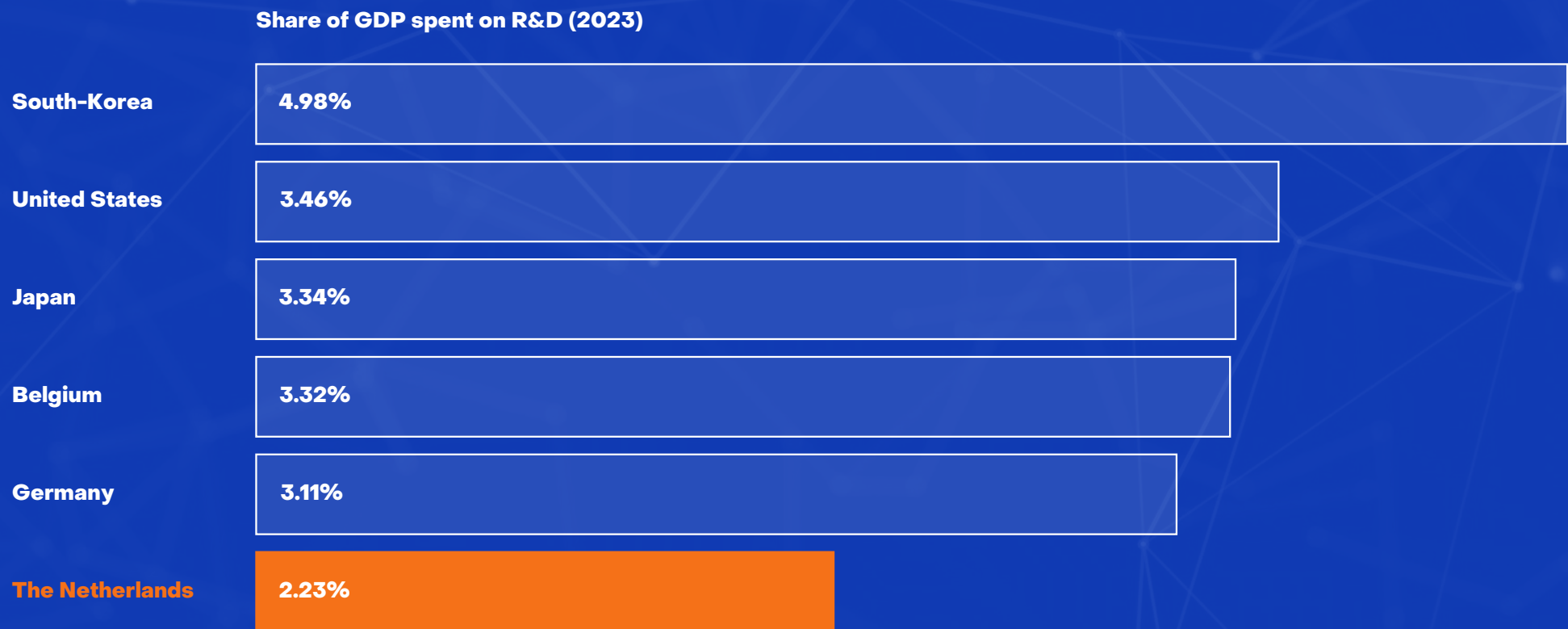
€119.119

We're underinvesting in the minds that will build what's next

Within the EU: % of students in Science, Technology, Engineering and Mathematics

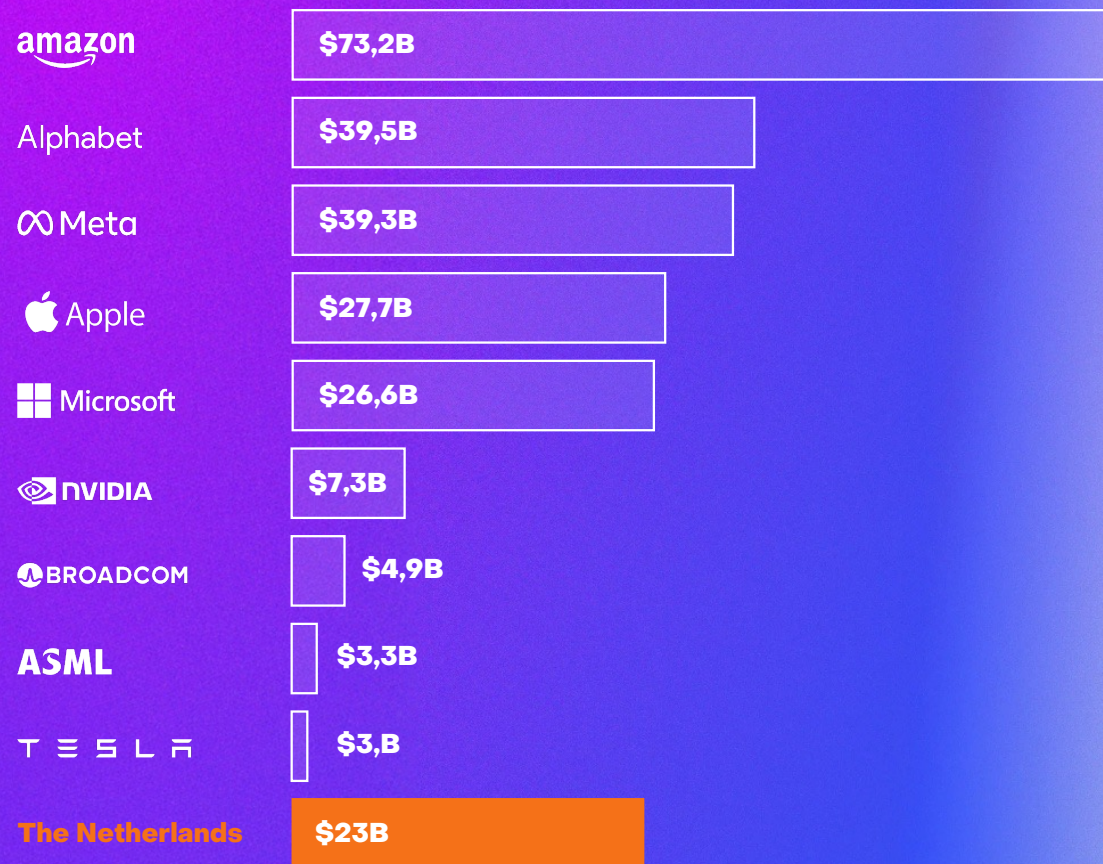


Dutch investments in R&D are lagging



The rise of Big Tech

R&D expenditures in USD (TTM 31 Dec 2022)





**To reach 3% GDP, €8.2B
is needed – €4.7B from
private sector**

**The Netherlands with 2.23% below
EU average (2023)**

- 1.56% of R&D expenditures by private sector
- 0.67% of R&D expenditures by public sector

ASML's R&D expenditures nearly match combined total of the other top 30 companies

R&D expenditures in the Netherlands (in Millions of Euros, 2023)

ASML Holding N.V.	€2,813
Koninklijke Philips N.V.	€700
Booking Holdings Inc.	€420
Koninklijke KPN N.V.	€307
Johnson & Johnson	€239
NXP Semiconductors N.V.	€265
DAF Trucks N.V.	€181
VDL Groep B.V.	€175
Thales Nederland B.V.	€144
Canon Production Printing Netherlands B.V.	€135
Rijk Zwaan Zaadteelt en Zaadhandel B.V.	€130
Unilever PLC	€99
Vanderlande Industries B.V.	€90
Koninklijke FrieslandCampina N.V.	€74
Lely Industries N.V.	€67
DEMOCOM Production B.V.	€66
Akzo Nobel N.V.	€60
Tata Steel Nederland B.V.	€59
Enza Zaden Beheer B.V.	€52
Nexperia N.V.	€50
Nedap N.V.	€47
ASM International B.V.	€37
Airbus Netherlands B.V.	€35
Teijin Aramid B.V.	€21
Priva Holding B.V.	€20
VMI Holland B.V.	€20
Koninklijke HaskoningDHV Groep B.V.	€16
Technolution B.V.	€16
Sdu B.V.	€12
SMART Photonics B.V.	€10



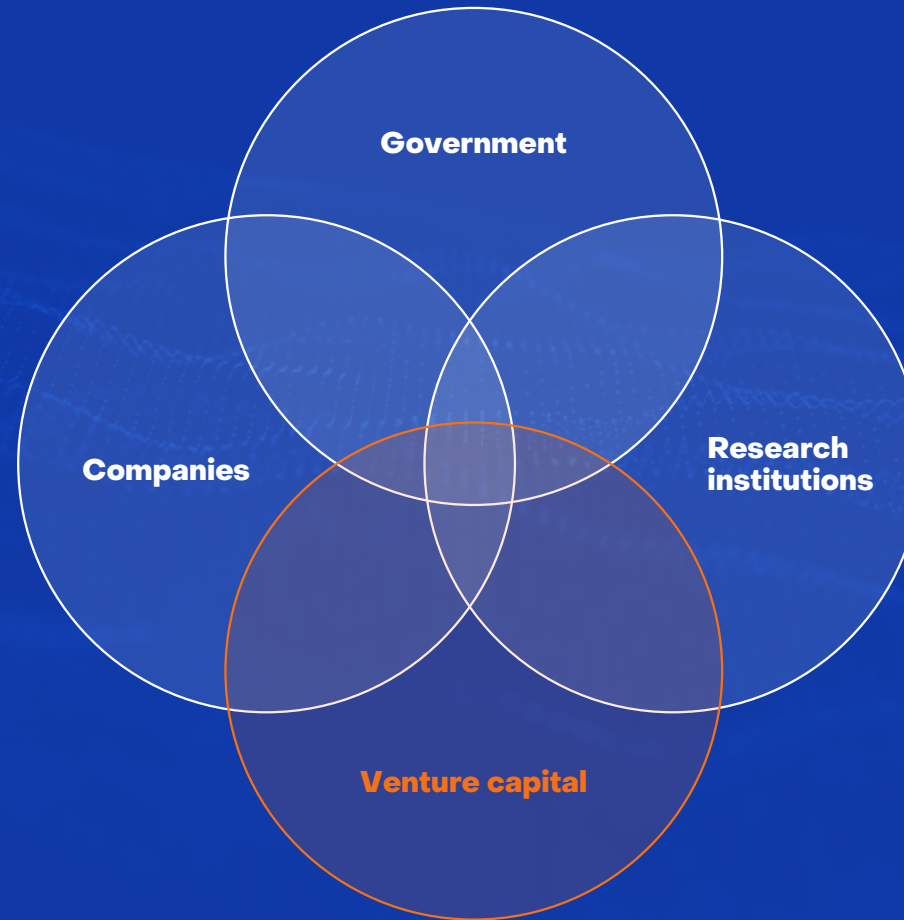


Europe is losing its industrial core

An aerial photograph of Apple Park in Cupertino, California. The circular building is the central focus, surrounded by lush green trees and a suburban neighborhood. In the background, rolling hills are visible under a clear sky.

US deeptech startups are growing four times faster than those in the Netherlands

From triple helix to innovation helix



Focus on key enabling technologies – NTS

1. Optical systems and integrated photonics
2. Quantum technologies
3. Process technology
4. Biomolecular and cell technologies
5. Imaging technologies
6. Mechatronics and optomechatronics
7. Artificial intelligence and data science
8. Energy materials
9. Semiconductor technologies
10. Cybersecurity technologies

High-Tech Megacusters around key technologies



Without megaclusters no new ASML's

- Laser-sharp national focus on innovation
- Build on strong existing tech ecosystems
- Share advanced labs, pilot lines, and equipment
- Attract global firms, top talent, and venture capital
- Boost private R&D investment - 3% of GDP
- Examples in Asia, e.g. South-Korea

Holst Centre Photonics Lab

6" InP Chip Pilot Line

A future megacenter in Eindhoven, already in motion

What we do now defines what we become.

1

**Focus:
No 100 Flowers Strategy**

2

**Strengthen the pipeline
from startup to unicorn**

3

**Improve investment
climate**

4

**Invest in infrastructure
and megaclusters**

TNO innovation
for life

It's our move — let's lead.