THE ROADMAP TO FUTURE PROSPERITY

A strong Netherlands in a relevant Europe

THE WENNINK REPORT

CONTENTS

PREFACE

This report is rooted in a sense of commitment to our country and concern about the direction we are heading. The Netherlands is a wonderful country - with smart people, successful businesses and a society in which we look after each other. But the foundations under those strengths are starting to subside. We all feel it: decisions take too long, rules pile up and the energy to tackle problems together seems to be ebbing away. Our strong economic base is crumbling. This has major consequences and will affect all of us. If we do not take action, our quality of life will deteriorate significantly.

The challenges of our time are great and have a bearing on every aspect of our society. Digitalisation, the as yet uncompleted energy transition, increased security threats, but also an ageing population, the housing crisis and the pressure on public services all demand renewed cohesion and action. All these themes are underpinned by the same question: how can we maintain the Netherlands as a country where people have confidence in each other, in their government and in the future?

The world around us is changing rapidly. Technological and geopolitical developments are reshaping the balance of power and any country that fails to move with the tide and to deploy itself to develop and trade in smart solutions risks becoming dependent - not just economically, but geopolitically and socially as well. For the Netherlands - a country that earns its money through trade - this is damaging: if you don't have anything to trade with, you will have no clout in negotiations. We, as the Netherlands, do not want to be a mere onlooker as these changes take place; we want to participate in shaping the future. That ambition requires us to relearn how to make choices, work together and take action.

Given this context, this report is about more than just our competitiveness. It is about strengthening our societal resilience: our society's capacity to renew, recover and ensure that the generations of today and tomorrow continue to enjoy the same level of prosperity. In that respect, digitalisation, climate adaptation, healthcare and security are the great challenges of our time.

To maintain that resilience and safeguard our future prosperity, we must invest in what makes growth possible: in a lower regulatory burden, in modern infrastructure, in knowledge and talent, but also in mutual trust, in a decisive government and speed of action. If we do not act now, we will not only lose jobs and businesses, but our quality of life will also suffer considerably. Every day that initiatives run aground in rules and procedures, we miss out on economic opportunities and lose social energy. Every day that necessary choices are postponed, it costs the Netherlands more than the investments that are currently needed.

What struck me the most during the many conversations I had while preparing this report was the fact that the will to improve is everywhere, but people feel the system is getting in their way. In the Netherlands, we have tried to prevent risks by means of rules, but this has also narrowed the scope for action. The democratisation of decision making and implementation has gone too far, allowing indecision to prevail. This is disastrous for mutual trust - between government and business, between policy and implementation, between citizens and institutions.

And yet there is also every reason for optimism. All around the country I have met people and organisations that want to build the future - entrepreneurs, teachers, researchers, healthcare workers and civil servants. Their willingness to invest, to innovate and to take responsibility is great. What they are asking for is direction and space. The Netherlands wants to take action, but it needs to be allowed to.

That is why this report is about action. About the political courage to make choices, about leadership and about relearning how to work together. The aim is to give our economy new impetus. This will enable us to achieve economic growth that allows us not only to take on and finance the aforementioned social challenges, but also to create future prosperity. The necessary choices will inevitably cause friction - because they require priorities, honesty and sacrifices. But if we want the Netherlands of future generations to remain a country where people have prospects, where people receive a good education, where people get the care they need and where people are safe, then now is the time to act.

Other countries are making clear choices in terms of what they want to excel at. For South Korea it is semiconductors, for France it is quantum technology and innovation, and for the US and China it is artificial intelligence (AI). We must determine our own course. One rooted not just in a need to be competitive, but also in a feeling of competence, strength and responsibility for our society. Being a force in chip technology, renewable energy, healthcare innovation and defence is not an aim in itself, it is a means by which to maintain our freedom, solidarity and prosperity. If future governments fail to show that they and the public authorities more broadly can deliver - that decisions actually lead to improvements in people's daily lives - confidence in our democracy will erode further. Trust is not gained by words, but by action: a house that is in fact built, a licence that is indeed granted, an energy network that actually works.

The Netherlands has all the ingredients to make this happen: knowledge, creativity, capital and a strong tradition of cooperation. What we need is the political courage to make choices, the leadership to steer the right course and the mutual trust to do it together.

The future won't wait. Now is the time to build a stronger Netherlands. A country that is not only economically successful, but also responsible, resilient and safe. A country that safeguards the prosperity of its future generations. We don't have to think about it any longer. Let's get started.

Peter Wennink

SUMMARY

Sluggish growth and technological dependence: why the Netherlands must act now

This independent advisory report is a response to the request to translate the Draghi report - which outlined the future of Europe's earning capacity - to the context of the Netherlands. Dubbed 'the Wennink Report', it comes at a time when the Netherlands finds itself at a crossroads. Years of economic success have brought us broad-based prosperity, a strong social security sector and a high degree of wellbeing among the population. But these achievements offer no guarantees for the future. Dark clouds are gathering over our society. The war in Ukraine, the ageing of the population, the need for a sustainability transition and the pressure on public services make it clear that the foundations under our prosperity are beginning to erode. These great societal challenges require fundamental choices.

The essence of these challenges is economic in nature: in order to cover the rising costs of healthcare, pensions, defence and the energy transition, we need annual economic growth of at least 1.5%-2.0%. The current outlook, however, is sombre. De Nederlandsche Bank (the Dutch central bank, DNB) and the Netherlands Bureau for Economic Policy Analysis predict annual growth of only 0.5% to 0.9% in the medium term, which is not enough to sustain our current public services, let alone improve them. The Netherlands is in danger of losing its capacity to meet the challenges society faces.

To turn this tide, we need a structural change of course. Further economic growth will have to come almost entirely from higher labour productivity, while our productivity growth has actually been slowing for decades. We need a breakthrough to reverse this trend. Productivity growth is the only sustainable way to maintain prosperity, wage levels and public services. This will require investment of at least €151 to €187 billion in the high-productivity parts of our economy. This investment will have to be undertaken in the next 10 years, largely by the private sector.

This growth challenge coincides with a period in which the Netherlands and Europe are having to fight for their position in the world. Europe used to be a pioneer in innovation, but has not been this for many years now. As Mario Draghi showed, the gap between Europe and the technological frontrunners, China and the United States, is widening rapidly. These countries are investing massively - much more than Europe is - in key technologies such as artificial intelligence, semiconductors, drones, biotechnology and renewable energy. Europe and the Netherlands are dependent and in danger of becoming more and more dependent if nothing is done. However, the battle is not yet done. The Netherlands has all the necessary ingredients to remain a relevant player in technology globally. We have a strong knowledge

base, innovative businesses and a tradition of public-private partnerships. It is important to note in this respect that the Netherlands will always be dependent on other countries for certain technologies and raw materials, even if we manage to reverse the current trends. Those dependencies are unavoidable and do not necessarily have to be problematic: technology supply chains are complex and interconnected. It only becomes a risk when the dependencies are one-sided - if we simply become a 'buyer' of technology and are no longer a key player in the global high-tech value chains. In that situation, we lose our strategic relevance. Other parties will then set the conditions and prices for our access to technology.

So it is essential to focus on domains where we can build and maintain a strategic position. We must concentrate our efforts on high-end niche technologies in which we can stand out. These are more difficult to imitate and can therefore give us a more sustainable competitive edge. The focus in this report is therefore on four domains:

- Digitalisation & AI
- Security & Resilience
- Energy & Climate Technology
- Life sciences & Biotechnology

Together these domains are decisive for our future prosperity: they form the backbone of the great transitions of this century, they are characterised - partly due to their international societal relevance - by an explosive growth in demand and they increasingly determine the geopolitical balance of power. By means of targeted investment in these areas, the Netherlands can strengthen its strategic relevance in Europe and the wider world, and contribute to solutions for the great challenges of our time.

Preconditions are the key to investment and growth

There is great willingness to invest in the Netherlands' future earning capacity. These investments will only happen if the right preconditions are in place. However, this is the very area that has deteriorated in the past few years. The Netherlands is increasingly faced with 'overdue maintenance', as a result of which businesses, knowledge institutions and financial institutions are hampered by structural obstacles in all sorts of areas. In order to remove these obstacles, we have to make choices. We must choose to create the preconditions for a high-productivity economy. We need to take swift action on this within four categories:

- Expedite licensing procedures and simplify rules;
- Opt for the talent that our future needs;
- Ensure an affordable and reliable energy supply; and
- Strengthen the economic infrastructure.

There is a lack of speed and decisiveness in licensing and in regulation. This means societal goals become subordinate to slow and complex procedures. Risk-averse public administrators and supervisory authorities hamper innovation, while not enough decisive action is being taken on important issues. So instead, make the licensing system faster, more predictable and more straightforward for projects that are crucial for our earning capacity, such as energy infrastructure and industrial investments. Break through impasses, such as the current nitrogen deadlock, take back national control of licensing procedures for strategic projects and introduce regulatory sandboxes for strategic innovations, so that new technologies and investment projects can be tested, used and scaled up more rapidly.

The availability of well-qualified talent is a second major challenge. Year after year the quality of our education is deteriorating and technically qualified talent is becoming scarcer. We lack structured reskilling and upskilling programmes that can help tailor the skills of our labour force to the changing demand. And we increasingly discourage international students and knowledge workers who could fill part of this gap. We are also creating obstacles to a healthy labour dynamic by clinging to uncertain temporary contracts and rigid permanent ones. That is why we need a National Talent Agenda that will focus fully on training, education and skills so that the future growth we aspire to can be achieved. The social security system and labour market policy also need recalibrating to ensure they tie in with our economic and technological ambitions.

Access to affordable and reliable energy is the third essential precondition for many investments. Congestion on the power grid means that thousands of businesses and organisations are having to wait to be connected, which stalls innovation and the sustainability transition in the Dutch economy. In the short term, the existing grid capacity could be used more efficiently, through more flexibility and priority allocation. In addition, legal, financial and spatial planning interventions will be needed in order to achieve a permanent solution to this problem. Electricity prices in the Netherlands are significantly higher than in surrounding countries, which prompts strategic industries to move elsewhere. In the short term, therefore, enhance the energy mix with affordable production sources and tax advantages, so that we can compete with Belgium and Germany in terms of prices. For the long term, work towards a robust energy mix with sufficient security of supply for industry and other strategic sectors.

Economic infrastructure is the fourth precondition that must be in place. The Rotterdam and Schiphol mainports, Brainport Eindhoven and innovation ecosystems such as the Leiden Bio Science Park and the Food valley campus in Wageningen are all places where scientific knowledge and industrial competencies come together. The Netherlands needs a national plan to strengthen these ecosystems. Specific points for attention for this are streamlining spatial planning procedures and investing in housing, energy infrastructure, digital networks and knowledge infrastructure. By engaging in public-private partnerships in these areas, we can build trust and enable the parties involved to make the greatest possible contribution to the Netherlands' international competitiveness.

If these preconditions are in place, a great deal is possible in the Netherlands. Our country has exceptional investment potential. For the purposes of this report, 51 concrete propositions were collected from more than 30 consortiums across the four above-mentioned domains, via a broad public-private survey. More than a thousand experts fleshed out proposals representing a total investment potential of around €126 billion, most of which can be financed with private funding. These propositions build on the innovation infrastructure that was in part developed over the past few years via the National Growth Fund and which are aimed at bringing innovative technologies to market more quickly. These investments will make a significant structural contribution to the economic growth that the Netherlands needs. The 51 propositions from this agenda can evolve to form the core of a Dutch investment and industrialisation strategy.

Ensuring the preconditions for investment are in place is no easy task. It requires difficult choices that have been postponed for too long: about how we want to use the limited space we have in the Netherlands, about allocating the scarce capacity on the power grid, about nitrogen emissions and about the use of labour. Not everything is possible, and it is definitely not possible to achieve everything at once. But if we have the courage to make those choices, there is significant scope to achieve the Netherlands' growth potential and safeguard our strategic relevance.

Implementation: decisive governance and stable financing

A plan is only as good as its implementation, however. Without the appropriate financing and administrative organisation, the recommendations in this report cannot be achieved. First of all, it is important to generate as much private investment as possible. To achieve this, the Netherlands will have to win back the trust of investors, both here and abroad. Years of unstable policy have led to a breach of trust that can only be remedied by means of a credible and consistent strategy for the coming decade. Only then can ambitious public-private collaboration be restored.

Public investment is also needed. First and foremost, in order to put in place the preconditions for this investment. At least €19 to €62 billion will be needed for this in the coming decade. But fostering innovation also requires public funding, which must be spent in such a way as to maximise private investment. Two strong institutions will be needed to ensure our public funds are used as effectively as possible: a new National Investment Bank to be set up that will bring together existing instruments and focus on public-private co-funding of the necessary investments in technology and infrastructure. With a working capital of €10 to €20 billion, up to €100 billion could be mobilised. The new National Agency for Groundbreaking Innovation, which, with a budget of €2 billion, will focus on fostering innovative ecosystems and funding strategic innovation projects that have groundbreaking impact. Both institutions must operate at arm's length from the political arena, with professional management and a clear mandate. This guarantees stability for the long term.

Scope needs to be created for these public investments, which requires a government budget incorporating less expenditure on goods and services and more investment. Greater insight is needed into the long-term return on investments, so that our budget system rewards an approach that looks further ahead. Consumption expenditure must be limited, inefficient tax measures must be abolished or improved and non-strategic state holdings must be sold. A new cabinet must also be willing to allow a controlled increase in the national debt, for investments that will demonstrably yield major economic benefits. Serious investment in our future prosperity requires difficult choices, including in public finances.

Finally, this task demands a new, strong administrative structure that will actually realise these strategic choices. Future earning capacity must be designated as a matter for top-level decision making, under the responsibility of the prime minister. The Minister of Economic Affairs must also be able to pursue comprehensive economic policy, and must therefore be given back stewardship of energy and trade policy. An independent Government Commissioner for Future Prosperity will help implement interdepartmental tasks and will organise the public-private dialogue via a National Investment Council. With a statutory mandate, a dedicated fund and an effective implementation unit, this commissioner will be able to overcome impasses and expedite projects. This enables strategic goals - such as solving the issue of grid congestion - to be achieved through clear prioritisation, interdepartmental coordination and public decision-making power.

These ambitions also require changes to the broader civil service: in order to make this administrative structure work, the government must become less complicated and more professional. The extreme burden of accountability in politics has led to a kind of fetishism for processes. As a result, processes have been put before goals and the government no longer serves society to the extent it should. Political office holders, civil servants and supervisory authorities must find courage again: the courage to take action, the courage to take risks and the courage to pursue societal goals quickly and effectively.

Let's get started

Not taking action is also a choice. Every day that we are not investing in the future of our country, we are allowing the cost for future generations to rise. This report shows that the possibilities are there: we know what is needed, what we need to invest in and how we need to do that. The report thus also expresses a great deal of confidence in the future of the Netherlands. The will to build, to innovate and to work together is present everywhere. Let us harness that energy and make a start today with the choices and investments that will make our country stronger and more resilient. The future won't wait.

PART I

WHY THE NETHERLANDS MUST INVEST NOW

WHY THE NETHERLANDS MUST INVEST NOW

The Netherlands is a wonderful country. There is broad-based prosperity, accessible healthcare, strong social security and beautiful nature. That is certainly something to be proud of, because decades of hard work have gone into this prosperity. Our small kingdom is the eighteenth largest economy in the world and the fifth largest in Europe. With a gross domestic product (GDP) of around €63,000 per person, we are among the richest countries in the world and, more importantly, 87.5% of our population describe themselves as happy.

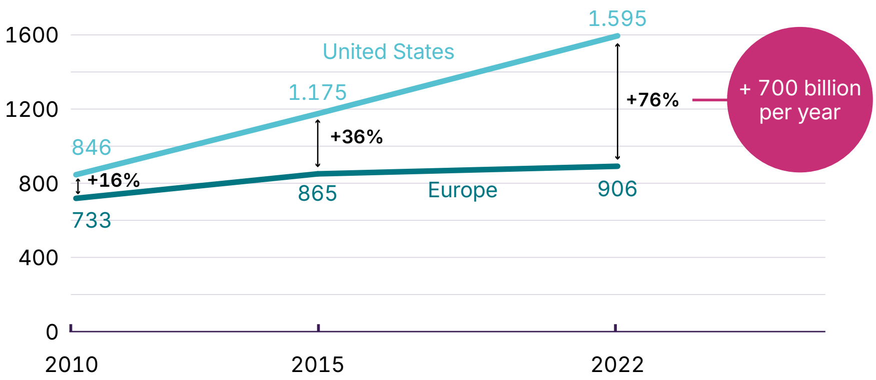
But this offers no guarantees for the future. Dark clouds are gathering over the Netherlands. The deadliest conflict in Europe since World War II has ended the peace dividend of recent decades. The ageing of our population poses major challenges for our healthcare and pension system and we are not yet halfway through the transition to a climate-neutral society. We also need to modernise our infrastructure, build more affordable housing and reverse the declining trend in the quality of our education. This requires more than just incidental measures, it calls for structural choices that keep society affordable.

Meeting these challenges will require economic growth: at least 1.5% to 2% a year. That is the minimum level to keep pace with the increase in spending, but still leaves no room for improving our purchasing power, for better social services and for further investment for the future. Projections from the Netherlands Bureau for Economic Policy Analysis (CPB) indicate that the Dutch economy will grow by only 0.9% per year in the medium term, however. Realising the additional growth needed is not easy. Achieving this will require at least €151 to €187 billion in additional, largely private investment until 2035. This investment challenge is at the heart of this report: without this boost, our future broad-based prosperity falls. These investments cannot take place now because the preconditions, such as nitrogen emission allowances and access to energy, are not sufficiently in place. This needs to be sorted out soon. Low growth does not just mean slow progress: with the enormous challenges in healthcare, defence and the energy transition, it means a structural decline in our prosperity.

National and international developments make this challenge even more acute. The United States and China are rapidly increasing their lead in critical technologies. While they aggressively invest in technological self-sufficiency and dominance in critical technologies like artificial intelligence (AI), semiconductors, drones and biotechnology with programmes like *the American AI Action Plan* and the 14th Five-Year Plan, the Netherlands is falling further behind. In seven-years' time, the difference in investment by large European and US companies has grown from 36% to 76%, to €700 billion a year (see Figure 1.1). We are being technologically sidelined, precisely in the domains that are so important for the future of the Netherlands. In the domains that will determine our future prosperity (digitalisation & AI, security & resilience, health & biotechnology and energy and climate technology), we are dependent on the US and China, but the converse is not true. This puts pressure not only on our economic position, but also on our *strategic relevance*. The Netherlands cannot turn this tide by itself, but it can play a crucial role within Europe in our shared strategic relevance.

Mario Draghi sounded the alarm about European competitiveness last year. The next two chapters show that time is running out in the Netherlands too. It is imperative for our future prosperity that we commit to economic growth and to increasing our strategic relevance. This is not an abstract goal, but a prerequisite if the Netherlands is to remain a prosperous, safe and liveable country in the future. It is necessary to ensure the happiness and prosperity of all Dutch people and to pilot us through the societal transitions of today and tomorrow.

Figure 1.1 Capital spending and R&D spending of large* European** and US*** companies.
In billions of euro (€), normalised to 2022 prices****



* 'Large' is defined as having turnover of more than $1 billion or €1 billion.
** Europe 30 = EU-27 plus Norway, Switzerland and the UK.
*** Only listed companies are considered; intangible assets are excluded.
**** Historical spending for both the Europe 30 and the United States has been adjusted for inflation.

Source: Investment: Taking the pulse of European competitiveness (2025) | McKinsey Global Institute

CHAPTER 1

The investment challenge: why the Netherlands needs to adjust course now

The Netherlands is at a defining moment in its economic development. In order to pay for our societal transitions, we need to generate economic growth of at least 1.5% to 2%. The key to this growth lies in growing productivity, which will require at least €151 to €187 billion in productivity-enhancing investments. By directing these investments towards socially important domains, everyone can benefit from them.

480 billion

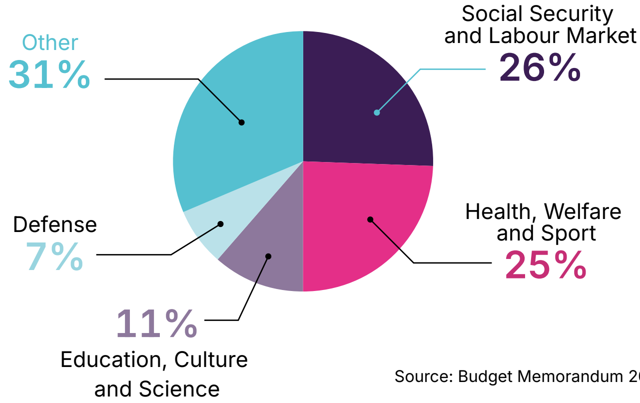
In government spending in 2026

1.1. Without economic growth, our public services will come under pressure

Many of the most important things in our country are publicly funded. Fundamental services like unemployment benefits, allowances, healthcare and defence are paid for from the Dutch treasury, and thus from taxes and contributions collected from all of us. As Figure 1.2 shows, in 2026 almost 70% of Dutch government expenditure (totalling over €480 billion) goes to these categories. Healthy public finances are therefore crucial to maintain and improve the public services we expect from the Dutch government.

Figure 1.2 Dutch government expenditure in 2026 by expenditure category[1]

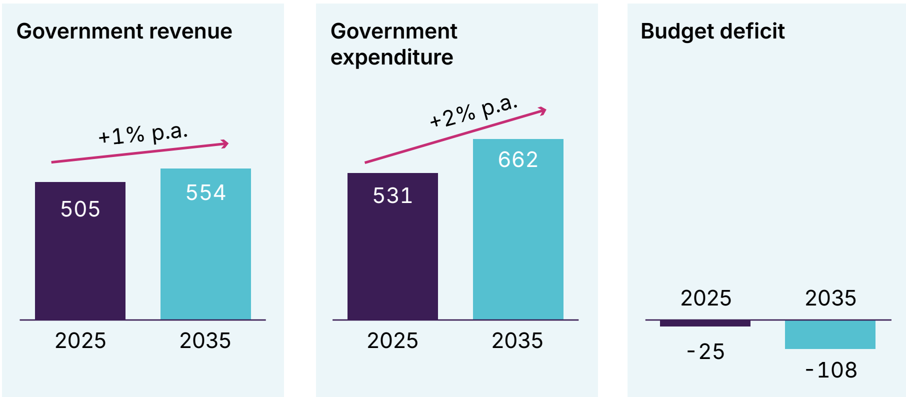
As a percentage (%) of the central government budget



Source: Budget Memorandum 2026.

Figure 1.3 Projected development in government revenue and government expenditure*

In billions of euro (€), normalised to 2025 prices



* See Appendix 3 (online) for a description of the method and assumptions.

100 billion

higher government expenditure in 2035

The Netherlands, especially compared to many European countries, has been pursuing a prudent financial policy for decades. This has resulted in one of the lowest public debts in Europe. Our debt ratio of 45% is significantly lower than that of Belgium (107%), France (114%), the US (121%)[2] and even debt-averse Germany (62%).[3] Our trend-based budgetary policy has allowed the Dutch government to retain room to address the challenges of the future. We now see these challenges looming. Over the next 10 years, government expenditure will rise twice as fast as revenues as a result of our economic growth declining but spending in healthcare, defence and climate having to rise. For example, healthcare spending has already increased from 6% to 9% of GDP since 2000. This could be financed because the government's interest charges have been exceptionally low for many years. In the future, however, this buffer will no longer be there: interest costs will rise due to higher interest rates, while healthcare spending is expected to rise further (to around 12% of GDP in 2035). Our defence spending as a percentage of GDP will also double to 3.5% as a result of the new NATO standard.[4] As Figure 1.3 shows, additional government expenditure is expected to be more than €100 billion a year higher in 2035 if firm cutbacks are not made.

Because government revenue is out of step with expenditure, projections indicate that under current policies, including additional healthcare, defence and climate spending, the Dutch debt ratio will rise to more than 200% of GDP in 2060.[5]

234%

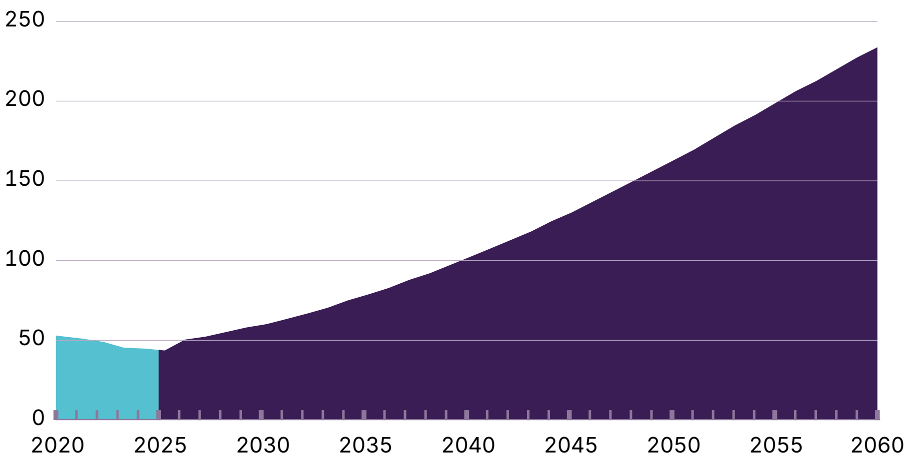
Debt ratio as a percentage of our GDP in 2060, if policy remains unchanged

These estimates do not yet take into account unforeseen challenges, such as the war in Ukraine, the Covid-19 pandemic and the Euro area crisis past and present. Such high debt is a major problem: investors lose confidence that the government will be able to repay its debts. They subsequently set higher interest rate requirements to compensate them for this risk, which in turn leads to higher interest costs and ultimately to an untenable situation. This kind of negative spiral occurred in Greece, for example. To avoid this scenario, with the current growth projections, the Dutch government will have to make substantial cutbacks or be forced to increase taxes.[6]

So if these additional costs cannot clear the debt, the Dutch government will have to generate almost €100 billion in additional tax revenue. Households will feel this directly in their pockets, as they currently bear about 63% of all government revenue via payroll tax, income tax, VAT and excise duty. If burden sharing remains the same, with the current growth path an average household will, in ten years' time, lose €1,700 annually in terms of purchasing power. If our growth declines even further, say to 0.5% a year, it will cost an average household more than €7,000 a year. If no tax increases are implemented, spending will have to change significantly. As Figure 1.2 shows, however, these cutbacks come at the expense of fundamental social services. And while there are certainly gains that can be made in efficiency, the sheer scope of the austerity task means that the quality of these social services will be in jeopardy.

Figure 1.4 The expected development in the Dutch debt ratio if policy remains unchanged

As a percentage (%) of gross domestic product



Source: CPB (Netherlands Bureau for Economic Policy Analysis)

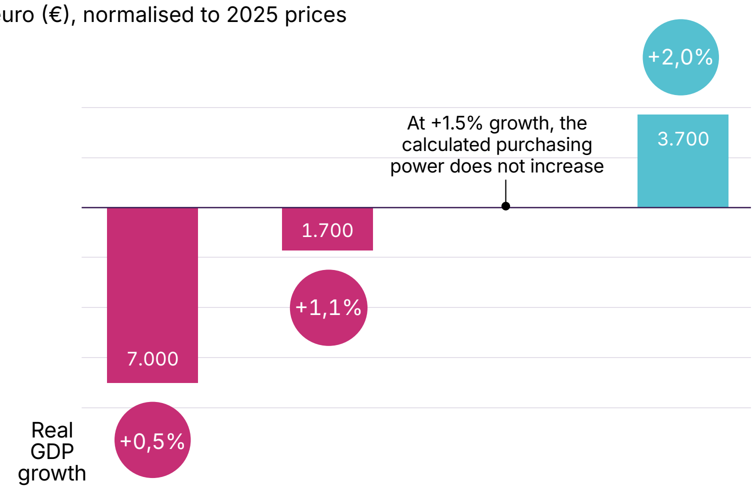
1.5%

economic growth is necessary at a minimum to maintain our prosperity

Only economic growth can mitigate this loss in purchasing power (see Figure 1.5): at 1.5% growth, purchasing power is expected to remain stable; only at higher growth is there any improvement. These positive effects do not happen automatically: achieving 1.5% to 2.0% growth also requires additional public spending. And growth on its own does not automatically solve the budget deficit: the scenarios with more than 1.1% growth assume that some of the government expenditure will not grow in line with GDP, leaving room for investments. Choices in limiting the increase in government expenditure, for example the state pension, have consequences for the distribution of wealth. But growth is simply necessary to even make these choices at all. Our purchasing power cannot remain stable without the absolute minimum of 1.5% growth. To build our prosperity above this level, the goal should be to achieve 2% growth or more. This rate is not a law of nature: the exact growth path needed to keep our collective services affordable could turn out to be higher or lower in the future. It also depends on demographic developments, productivity growth and political choices on the scope and quality of public services. It therefore makes sense to see 1.5% growth as a realistic minimum value within a range of 1.5% to 2% growth.

Figure 1.5 Calculated* development in purchasing power in 2035 per household for each growth scenario**

In euro (€), normalised to 2025 prices



* See Appendix 3 (online) for a description of the method and assumptions.

** Under the assumption that household disposable income grows in line with GDP and that budgetary policy evolves in such a way that public debt remains stable.

1.2. A breakthrough in productivity is necessary for growth

2.9%

the economy grew between 1984 - 2003

A growth rate of 1.5% to 2% is not unrealistic: such annual growth is not uncommon in our economic history. In the years 1984-2003, the Dutch economy actually grew at an average annual rate of 2.9%. But our growth rate has halved to 1.5% in the 20 years since. Given current trends, our growth could even halve again in the next 20 years - with all the consequences this would entail.

The reason for this decline can be found in the structure of Dutch economic growth. Growth is driven by two factors: i) additional use of 'labour' - more hours worked; and ii) higher productivity in these working hours. Economic development in the Netherlands over the past two decades has been mainly driven by the first factor: extra input of labour. Almost two-thirds of the economic growth was due to growth in labour input, and only one-third to growing productivity.[7] Collectively, more of us have started working: an increasing number of people in the Netherlands are in paid employment. But our productivity during those hours worked increased only marginally. This ratio cannot be sustained as a basis for economic growth in the coming decades. Although our labour input will continue to grow until 2030 and probably keep our economic growth above 1% for a few more years,[8] it will stagnate after that. Growth in labour input will no longer be able to mask our low productivity growth.

There are a number of reasons for this. Firstly, a demographic reason: because of the ageing population, an increasingly smaller percentage of the Dutch population will be working, while a larger percentage will be retired.[9] There is also not much stretch left in the labour input of the existing workforce. 85% of Dutch people aged between 15 and 64 are available to work - a labour contribution level that is historically and internationally very high. In view of limiting factors such as disability, physical limitations and educational commitments, it seems unlikely that our labour force participation rate will increase much further.[10] In the Netherlands, we do work significantly fewer hours per worker than in many other economies. On average, each working person produces about 1,450 hours worked per year. This is well below the OECD average of 1,740 hours, and significantly less than countries such as New Zealand (1,751 hours), Canada (1,694 hours) and South Korea (1,872 hours). Our high employment rate and high proportion of informal work such as child and informal care contribute to this. In addition, working more hours in the Netherlands is often not rewarded as the result of high marginal tax rates and a complex benefits system. Many people in part-time jobs - even in sectors with shortages - would like to work more.[11,12] A change in policy and mindset that actually rewards working more hours can indeed contribute to higher labour input. But our stagnating working population also means that there are limits to the total number of extra hours that can be worked. This limits the growth potential in labour input.

Outside our existing working population, labour input could increase due to higher labour migration. DenkWerk calculates that our net labour migration would have to increase by 65,000 workers per year to reach 1.5% growth per year.[13] However, such an increase would also put additional pressure on social services and the housing market[14] and is far beyond society's structural absorptive

> "Productivity isn't everything, but, in the long run, it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.""
>
> – Nobel laureate Paul Krugman

85%

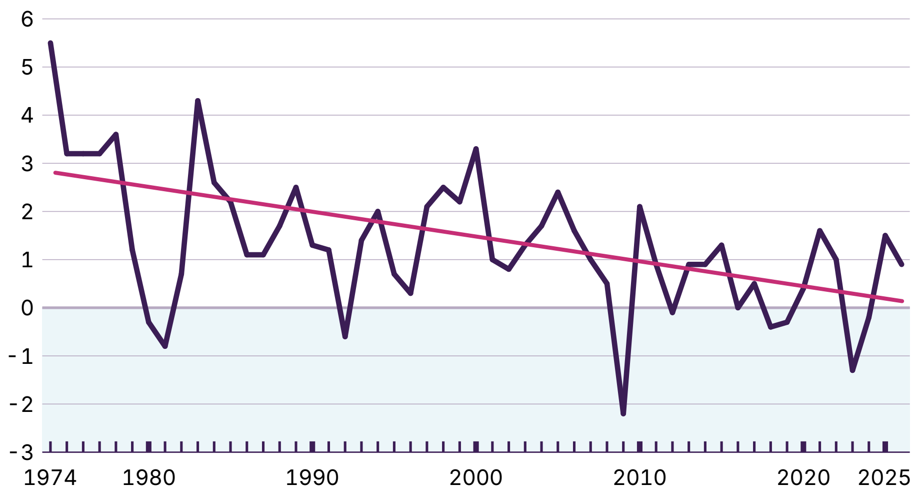
of 15-64 year olds are available to work

capacity. While migrant workers are crucial to Dutch societal transitions, they alone cannot be the answer to the Dutch growth question.[15]

Due to the limited potential of an increase in labour input, economic growth will have to come mainly from rising labour productivity.[16] Labour productivity is simply the value added per hour worked: it shows how efficiently we use our labour. Productivity is therefore the only sustainable way to increase prosperity, wages, purchasing power and living standards.[17] Boosting productivity growth is thus of paramount economic and social importance. Our productivity growth has, however, been showing a declining trend for decades, as shown in Figure 1.6.[18]

Figure 1.6 The trend in Dutch labour productivity growth over the past 50 years[19]

As a percentage (%)



Source: CBS.

Our productivity growth over the past two decades has been just 0.6% per year, far below the 1.8% from 1974-2003, and well below the level needed to achieve 1.5% economic growth. It is not wishful thinking that we can achieve such growth again: over the past 10 years, productivity in the US has increased by 1.7% per year, driven by the explosive growth of the tech industry.[20] Average annual productivity growth is also significantly higher among our European neighbours like Sweden, Denmark and Switzerland than in the Netherlands. [21] So there is no fundamental reason why a positive development in our productivity growth would not be possible.

However, without productivity-enhancing investments, both public and private, this trend cannot be broken. Improving the knowledge and skills of skilled workers, creating new products, improving production processes and purchasing machinery are all ways to increase productivity - and they all require investment. These investments are becoming less and less attractive in the Netherlands, however. Because of the nitrogen crisis, new factories are not being built. High energy costs are driving high-productivity companies abroad, and slow regulations hamper innovation. These preconditions, which are necessary for investments in a productive, innovative economy to pay off, have deteriorated rapidly in the Netherlands in recent years. As a result, investment is stalling.

0.6%

per year was our productivity growth over the past two decades

This lack of investment also prevents the process of 'creative destruction': new products, technologies and processes to replace the old ones do not get off the ground. This problem can be seen in the low business dynamics in the Netherlands. Too few companies are being set up - and too few are disappearing. Even our most dynamic sectors are only as dynamic as the European average, and it is precisely our high productivity sectors that score low for creative destruction.[22] This lack of dynamism dampens our productivity growth.[23] Old, low-productivity businesses are not forced to compete with new, innovative firms.[24] This effect is not only visible within sectors: it also manifests itself in structural changes in the Dutch economy. Employment has increasingly shifted from high to low-productivity sectors in recent decades. Temporary employment agencies, slaughterhouses and cleaning companies are becoming a larger part of our economy, while high productivity sectors such as chemicals, telecoms and financial services are shrinking.[25]

So our productivity growth is low partly because our sector structure is shifting towards low-productivity sectors, and investments in capital and research and development (R&D) that boost productivity are lacking due to deteriorating preconditions. These two effects reinforce each other: high-productivity sectors invest relatively heavily and are therefore hit hardest by deteriorating preconditions in the Netherlands. As our sector structure deteriorates, our economy ends up in a vicious circle. This trend must be reversed if we are to achieve a breakthrough in our productivity growth.

"Economic growth springs from better recipes, not just from more cooking."

– Nobel laureate Paul Romer

1.3. The Netherlands needs large-scale investment

151-187 billion

in investment needed over the next 10 years for 1.5% growthi

The Netherlands generates too little productivity-enhancing investment to achieve 1.5% growth. This tide cannot be turned overnight. The Netherlands will need to structurally increase investment every year. To map out that investment gap, TNO Vector and RaboResearch, on their own initiative, made an econometric estimate of the investments that would be needed until 2035 to achieve at least 1.5% growth. These estimates represent a balanced investment package that expects investments in capital and human capital in addition to private and public R&D investments. RaboResearch estimates that €151 billion in additional investment is needed to increase our growth rate to 1.5%.[26] Using a slightly different methodology, TNO Vector arrives at an additional investment task of €187 billion over the next 10 years; around €19 billion per year.[27]

The investment gap calculated by TNO and RaboResearch corresponds in size to the relative difference in productive investments between the Netherlands and the US. Both economies spend about a fifth of their GDP on investments. But, as Figure 1.7 shows, the composition of those investments differs significantly. While we spend relatively more on building housing and commercial buildings, the US actually invests 1.8% of its GDP, almost €500 billion, more than the Netherlands and Europe in capital goods such as machinery, equipment and intellectual property products. Those are the investments that really make people more productive. Better machinery, new technology and smarter processes make a difference in this; capital for other things like commercial buildings does not change how you produce and therefore contributes less to productivity growth. Scaled for the size of the Dutch economy, the difference in productivity-enhancing investments amounts to a gap of €19 billion per year. As Mario Draghi noted last year, productivity-enhancing investments are lagging behind in Europe. And as this analysis shows, the Netherlands is no different from the rest of Europe in this respect.

[1] Technical footnote: The structural investment boost as calculated by RaboResearch and TNO cannot, based on models, result in a higher structural growth rate. In the long term, depreciation of these investments will also rise, which will again reduce growth. The Dutch level of prosperity does remain structurally higher, however. Temporary is also relative in this case: the models estimate that with this investment boost, the growth rate will remain around 1.5% until well beyond 2040. For details, see the studies by TNO Vector and RaboResearch.

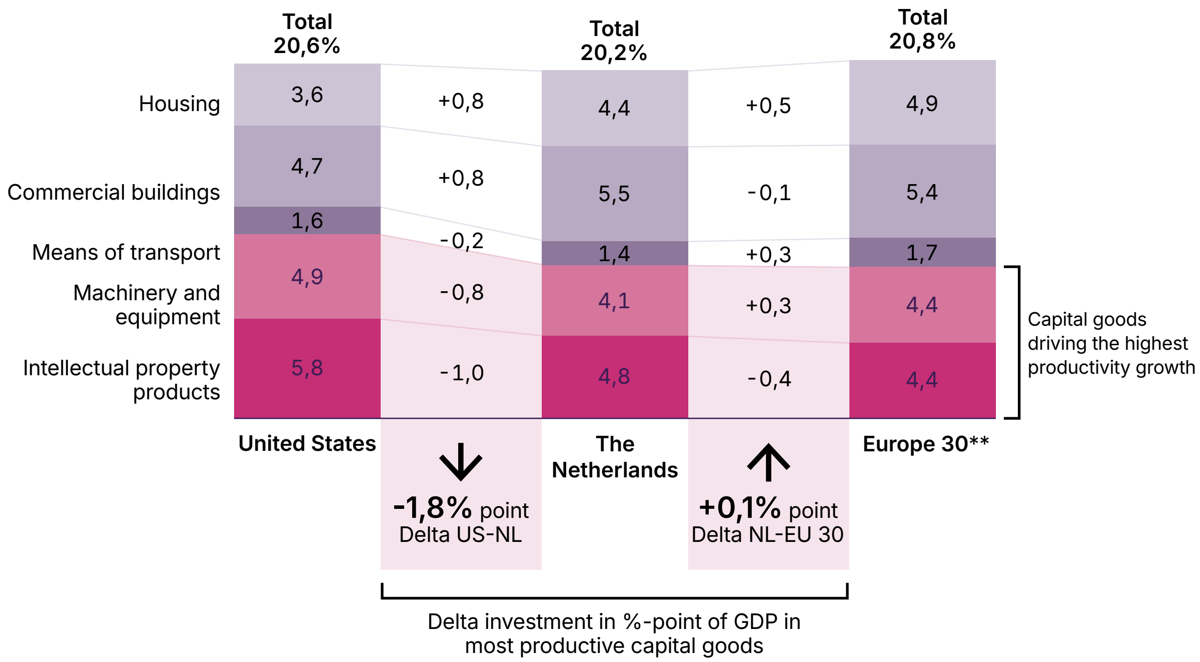
14,044

businesses and organisations waiting for an electricity connection

Closing the investment gap will require large-scale, mainly private investment, according to analyses by TNO Vector and RaboResearch. But because of the deteriorating economic preconditions in the Dutch economy - for example, on the power grid, where 14,044 businesses and organisations are waiting in the queue for an electricity connection - these investments are not materialising at the moment. Major public investments will therefore also be needed to put the preconditions in place. Even then, resources are still scarce, which is why the government must take a steering role to move our economy towards high-productivity activities. This means that the business sector must also be challenged: they must be incentivised to innovate, compete and invest. In this steering, the challenges facing Dutch society must be central. After all, growth is not an end in and of itself, it serves the common good. The high-productivity sectors that the Netherlands focuses on must create broad societal benefits.[28] Investments must not only generate private returns.

Figure 1.7 Investments by type of capital good (capex and R&D)*

Average for the 2010 - 2022 period, as a percentage (%) of GDP



* In national accounting, R&D is, unlike in corporate accounting, treated as an investment (intellectual property) because it creates future economic value.
** Europe 30 = EU-27 plus Norway, Switzerland and the UK, excluding Romania.

Source: AMECO; Investment: Taking the pulse of European competitiveness (2025) | McKinsey Global Institute.

It is possible to realise a high-productivity economy that grows by at least 1.5% to 2% annually, that focuses its energy on addressing societal challenges and that thus creates broad-based prosperity. This, however, will demand a great deal from both the government and the business sector. Without hundreds of billions in investment, hard work and political courage, our growth will lag behind. Without economic growth, we will lose our purchasing power and our ability to keep paying for our social services. This would see the Netherlands lose a significant part of its prosperity.

1.4. In summary

- The Netherlands is in the midst of major societal transitions in healthcare, housing, defence and climate.
- Economic growth is indispensable in order to successfully survive these transitions. The expected medium-term growth rate of 0.5% to 1% is too low to keep our services on level; at least 1.5% to 2% annual growth is needed to continue financing our purchasing power, social security and public services.
- The contribution that additional labour input can make to our economic growth is coming up against its limits due to the ageing of the population; future growth must come almost entirely from higher labour productivity.
- However, productivity growth in the Netherlands has been declining for decades. Investments in technology, innovation and capital are lagging, and our economy is shifting to sectors with relatively low productivity. A structural turnaround is necessary.
- Large-scale productivity-enhancing investments are needed to achieve this. The Netherlands needs to mobilise around €151 to €187 billion in additional (mainly private) investment over the next 10 years. These investments can only be generated if the preconditions in the Dutch economy improve substantially.
- These investments must be profitable for society as a whole. A high-productivity economy that grows at least 1.5% to 2% per year and puts its energy into the societal challenges of today and tomorrow is possible.
- If we do not achieve this turnaround in our economic growth, we will soon be lacking the economic strength to meet societal challenges in healthcare, education, climate and defence. Dutch purchasing power and prosperity will decline in that case.

CHAPTER 2

Investing to stay strategically relevant: four domains that determine our future

The Netherlands and Europe are rapidly falling behind China and the US from a technological perspective.To remain strategically relevant, the Netherlands needs to build technological niche positions in four domains: digitalisation and AI, security and resilience, energy and climate technology, and life sciences and biotechnology. This requires substantially higher R&D investments and a much more effective translation of scientific knowledge into commercial applications and scalable businesses.

2.1. Europe is rapidly losing ground to China and the United States in critical technologies

Europe has traditionally been an innovative continent. Groundbreaking innovations such as Bluetooth, MRI technology, wind energy, and ASML's EUV lithography machines all have European roots. These kinds of technological innovations are not isolated; each of them has laid the foundation for new industries. This type of innovation is a key driver of productivity growth and thus crucial for our prosperity. But its significance goes beyond pure economic earning capacity. Technological innovation is also vital for our well-being: medical technology improves our healthcare, energy technology helps make our economy more sustainable and digital technologies are crucial for our national security.

At the same time, technology increasingly determines the balance of power between countries. Technological leadership is used to exert political or economic pressure.[29] That is also commonplace in Europe; European armed forces rely heavily on US defence technologies[30] and the European Union (EU) relies almost entirely on China for rare earth metals that are crucial for all kinds of modern technologies.[31]

Dependencies do not necessarily have to be problematic: technology supply chains are complex and interconnected. It does, however, become a risk if the dependencies are one-sided. If we depend on the technology of others and they hardly depend on us, we lose strategic relevance. Other parties will then set the conditions and prices for our access to technology.

That risk is becoming increasingly concrete as our technological position is under increasing pressure. China and the US dominate in both the development and application of critical technologies such as AI.[32] Only four of the world's 50 largest

4

of the world's 50 largest technology companies are European

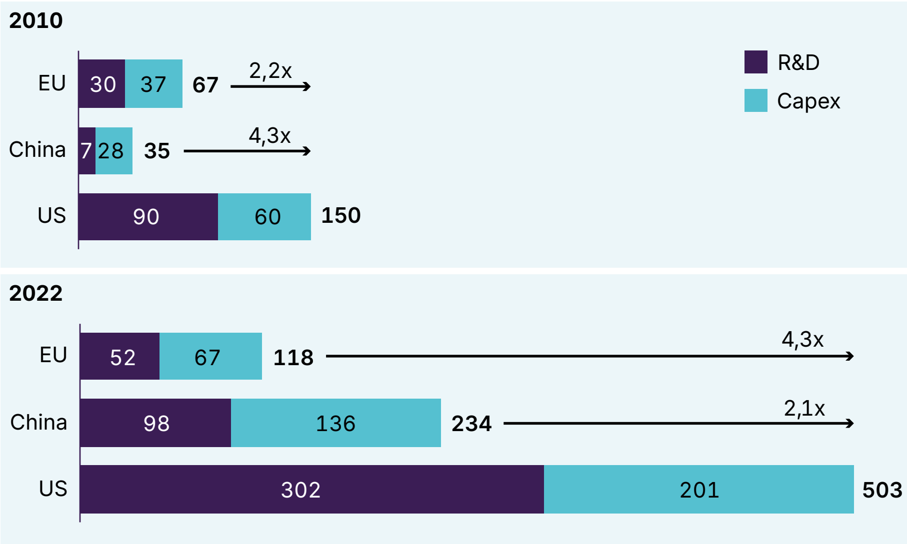
technology companies are European, and the EU is still only truly competitive in four out of the 14 critical technology areas.[33] Moreover, investments in the EU are much less likely to go to radical innovations,[34] while the economic impact of these technologies is the greatest.[35]

Large European technology companies also invest significantly less than their US counterparts. As shown in Figure 2.1, this gap is growing rapidly. In 2010, the difference was still a factor of 2, but now US companies are investing more than four times more. The difference in R&D investments is particularly striking: US companies invest six times as much in this. Meanwhile, China is on an impressive rise: between 2010 and 2022, CAPEX and R&D investment increased by a factor of 6.7. Whereas China lagged behind the EU as recently as 2010, the situation has now reversed.

This trend is worrying because the R&D investments of today form the basis for the technological leadership of tomorrow. If Europe fails to invest enough, we will miss the boat. This is not an abstract risk: the Draghi report calculated that the lack of a mature European tech industry largely explains the 'productivity gap' with respect to the US.[36] If our technology position continues to deteriorate, this will cost Europe an estimated €2 to €4 trillion a year in added value by 2040,[37] while economic growth is essential to keep our public services on level.

Figure 2.1 The R&D and CAPEX spending of technology companies* that are among the top 2,000 global R&D investors**

In euro (€), normalised to 2022 prices



* Computer hardware, computer services, electrical components and equipment, electronic equipment, electronic office machines, fixed line telecommunications, mobile telecommunications, semiconductors, software, telecommunications equipment.

** The top 2,000 includes a total of 322 EU companies (18.7% of total R&D investments), alongside 681 US companies (42.3%) and 524 Chinese companies (17.1%).

Source: 2024 EU Industrial R&D Investment Scoreboard.

“Those who do not count technologically are not at the table - and those who are not at the table are on the menu.”

– Peter Wennink

2.2. Europe must aim for strategic relevance in four domains

Strengthening Europe's technological position is not only an economic task, therefore, but also a hard geopolitical necessity. Those who do not count technologically are not at the table internationally - and those who are not at the table are on the menu. These risky dependencies are most evident in four societal domains:

1. Digitalisation and AI
2. Security and resilience
3. Energy and climate technology
4. Life sciences and biotechnology

Unilateral dependencies make us vulnerable because they limit our control over essential parts of the economy and society.

These domains are very important because they bring together three elements that determine our future prosperity: they form the backbone of the great transitions of this century, they are characterised - partly due to their societal relevance - by an explosive growth in demand and they increasingly determine the geopolitical balance of power. Digitalisation and AI largely determine the efficiency and security of the economy and the government. Security and defence technologies determine stability in a world of rising geopolitical tensions. Energy and climate technology are essential for the transition to a sustainable economy. Life sciences and biotechnology are crucial for health, food security and medicine supply. It is precisely in these areas that unilateral dependencies make us vulnerable because they limit our control over essential parts of the economy and society. These are domains in which the Netherlands and the EU do not want to be at the mercy of other countries.

These vulnerabilities are precisely why major economies structure their innovation and growth policies around these four domains. In China, this direction is visible in the 14th Five-Year Plan, which explicitly prioritises technologies within these domains, such as AI, semiconductors, biotechnology, new defence-related high-tech and batteries.[38] China is investing heavily in these domains to gain technological leadership, reduce dependencies on foreign technology and increase economic and geopolitical influence. But we also see this development closer to home; the European Commission is targeting these four priority domains with the new European Competitiveness Fund (an investment fund aimed at boosting European competitiveness).[39] This is part of a global trend where countries are actively pursuing policies to drive innovation and growth. This type of policy intervention increased by ninefold between 2017 and 2023. As such, active growth policies have long since ceased to be the preserve of emerging economies and have also become a matter of course in advanced economies.[40]

The Netherlands and Europe are vulnerable in these four domains. As a result, we are at risk of becoming even more dependent on Chinese and US technologies. A dependency that is already a reality in many places:

- Within the domain of digitalisation and AI, we are highly dependent on foreign technologies.[41] For example, our central government buys more than half of its cloud services from three US companies (Microsoft, Amazon and Google).[42] The EU also relies heavily on non-EU providers in the use of generative AI, such as ChatGPT,[43] while Europe itself invests significantly less in AI.[44] Because digital technologies have a winner-takes-all dynamic, there is often little or no possibility for European companies to catch up.[45] US dominance in this field also puts the privacy of European citizens at risk. Under certain conditions, these companies can be required to share data with the US government, even if it is stored on European servers.[46]

- In the security and resilience domain, Europe lags behind in cybersecurity technology. That makes us vulnerable in times of hybrid warfare. Also in the field of drones - increasingly important in modern conflicts - the EU lags well behind the United States and China in terms of production.[47] Especially given the rising geopolitical tensions, this is cause for concern.

Our technology position needs to be strengthened if Europe and the Netherlands are to remain strategically relevant.

- We are increasingly dependent on China for energy and climate technology. In addition to dominance in battery technology, China is well on its way to achieving dominance in nuclear power and technology.[48] Disruptions in that value chain, for instance due to an escalation of the conflict between China and Taiwan,[49] could slow down Europe's energy transition and prolong our dependence on fossil fuels.

- In the life sciences and biotechnology domain, Europe is heavily dependent on suppliers outside the EU for the production of active pharmaceutical ingredients (the basis for many generic medication such as paracetamol and ibuprofen).[50] In the field of industrial, or 'white', biotechnology, Europe is largely dependent on China for certain critical ingredients, such as vitamins.[51] There are also few alternatives to the sophisticated US lab equipment that many biotech companies use, such as machines to read DNA ('sequencing').[52] This is problematic, as supply problems or deliberate export restrictions can significantly delay European pharmaceutical production and development.

Dependence within these domains has a major impact on the future prosperity of Europe and the Netherlands alike. This is because it means our negotiating position in economic, diplomatic and possibly even hybrid and armed conflicts is weakened: we need them, but they hardly need us.

To turn the tide, Europe and the Netherlands must therefore strive for strategic relevance within these four domains. It is also essential to strengthen our technology position. Without investments, Europe and the Netherlands become a 'consumer' of foreign technology, putting our values at stake. The Netherlands can play a key role in preventing this, provided we make targeted investments in technologies that are promising for the Netherlands.

2.3. The Netherlands' strong technological starting position is under pressure

The strong Dutch technology position provides a good basis for contributing to Europe's strategic relevance. We have a number of high-quality technological ecosystems, including Brainport Eindhoven, Leiden Bio Science Park and Food valley around Wageningen. Dutch high-tech companies like ASML and Rijk Zwaan also have key positions in international value chains. In terms of knowledge and technology, too, the Netherlands still holds a strong hand: on the key technologies that the cabinet has identified as priorities,[53] the Netherlands is among the top 10 in absolute numbers of scientific publications, compared to benchmark countries the EU-15, US and China. As shown in Figure 2.2, the Netherlands also ranks reasonably well worldwide in terms of patents, which provide insight into our technology position. The picture topples when we look at the development over recent years: our strong starting position is under pressure. Between 2015 and 2025, the Netherlands lost ground on nine out of 10 key technologies.

This decline is partly due to China's emergence as a major technological player.[55] Between 1998 and 2023, Chinese R&D investment increased by a factor of 39. China now has the largest number of R&D employees in the world and is a leader in scientific publications and patents.[56] The Global Innovation Index (a leading ranking on innovation) also shows the Netherlands' downward trend. While coun-

Figure 2.2 The development of the Dutch technology position* over the period 2015 - 2025[54]

	Top 3	Position of the Netherlands
Optical systems and integrated photonics	China, United States, Japan	11 ↓
Quantum technology	United States, China, United Kingdom	11 ↓
Process technology	United States, China, Japan	10 ↓
Biomolecular and cell technologies	United States, China, Germany	11 ↑
Imaging technology	China, United States, Japan	6 ↓
Mechatronics and opto-mechatronics	China, United States, Japan	12 ↓
Artificial intelligence and data science	China, United States, Japan	12 ↓
Energy materials	China, United States, Japan	11 ↓
Semiconductor technology	China, United States, South Korea	13 ↓
Cybersecurity technology	China, United States, South Korea	14 ↓

China United States Japan South Korea United Kingdom Germany

* The technology position was determined based on the Patent Asset Index (PAI). This index measures the total value of countries' patent portfolio within a given technology domain, taking into account the number of patents and their quality (market coverage and number of citations). The development of the technology position is based on the Dutch share of global PAI over the period 2015 - 2025.

Source: TNO Vector.

The Netherlands spends

2.3%

of GDP on research and development

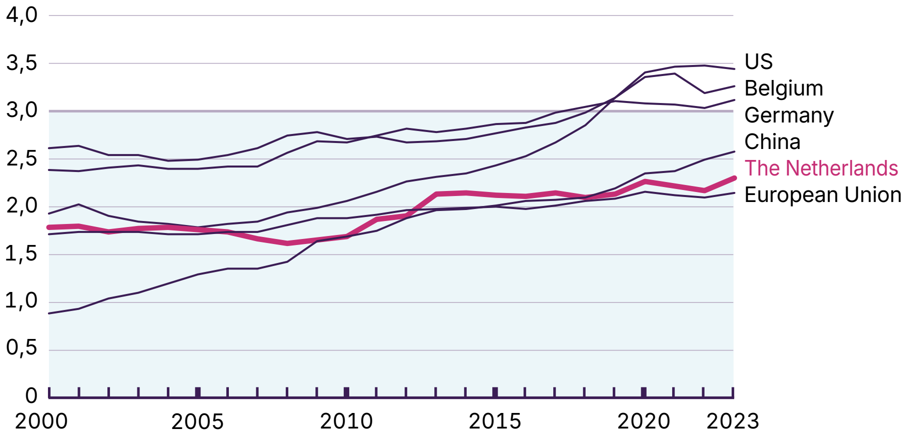
tries like Switzerland, Sweden and Singapore managed to maintain their top-five positions in this index and countries like China, India and Turkey continue to rise, the Netherlands has fallen from second to eighth place over the past eight years.[57]

R&D investments are indispensable to reverse the downward trend. They form the basis for new knowledge and innovations and are thus crucial for keeping the Netherlands a relevant technological player. But current figures give cause for concern: the Dutch R&D intensity (R&D investment as a percentage of GDP) is low (2.3%) and declining. TNO calculates that in the absence of additional policy, there is a real chance that the Netherlands will spend less than 2% of GDP on R&D in 2030,[58] while the target is to increase that spending to an R&D intensity of 3%.[59] This means that the Netherlands is falling behind countries such as the US (3.5%), Belgium (3.3%) and Germany (3.1%), as shown in Figure 2.3. To bring our R&D intensity to 3% by 2030, the cabinet needs to allocate an additional €14.9 billion for public R&D investments in the coming years. [60]

The low R&D intensity is not just a result of our sector structure, as is often thought. Sectors that naturally invest less in R&D, including the business services sector, are overrepresented in the Netherlands, while R&D-intensive sectors such as manufacturing are underrepresented. But a new analysis shows that the vast majority of the low Dutch R&D intensity is explained by an intrinsic effect: on average, Dutch companies invest less in R&D than foreign companies in the same sectors. This level of investment has fallen even further in recent years. [61]

Figure 2.3 The development of R&D spending in the Netherlands in an international perspective

As a percentage (%) of gross domestic product



Source: OECD, Main Science and Technology Indicators (MSTI database).

2.4. Innovation and scaling up are essential for the Netherlands' technological position

The R&D landscape has for years been dominated by a limited number of big players.

Today's major R&D investors are not necessarily tomorrow's innovators. European companies mainly specialise in mature technologies, for example within the automotive industry[62] There are opportunities for optimisation there, but the potential for radical innovation and thus economic growth is limited. The European economy is also not dynamic enough: the automotive industry has dominated the list of the biggest R&D investors for the past two decades (see Figure 2.4). It was the same in the US 20 years ago, but all the big R&D investors (Alphabet, Meta and Microsoft) are now to be found in the tech industry. The companies in China investing the most in R&D, including Huawei, Tencent and Alibaba, are also in this sector. [63]

At the same time, Figure 2.4 illustrates the limited innovation dynamics in the Netherlands.[65] The R&D landscape has for years been dominated by a limited number of big players: ASML, Philips and NXP. These three accounted for almost a quarter of all private R&D investments in 2023.[66] The latest figures show that ASML maintains its leading position: in 2024, the company's investments in R&D rose to more than €3 billion. This further increases ASML's investment dominance.[67]

To strengthen our future prosperity and economic resilience, the number of companies investing heavily in R&D must increase significantly. To achieve that, it is crucial that we know how to translate good ideas into applications in the market. This does not happen enough now. Dutch science excels in many fields,[68] but we

Figure 2.4 Top 3 R&D investors in the US, EU and the Netherlands[64]

United States

2002	2011	2021
Microsoft (ICT services)	Microsoft (ICT services)	Alphabet (ICT services)
Ford (automotive)	Intel (ICT services)	Meta (ICT services)
Pfizer (health)	Merck (health)	Microsoft (ICT services)

Europese Unie

2002	2011	2021
Mercedes-Benz (automotive)	Volkswagen (automotive)	Volkswagen (automotive)
Siemens (ICT-products)	Mercedes-Benz (automotive)	Mercedes-Benz (automotive)
Volkswagen (automotive)	Bosch (automotive)	Bosch (automotive)

Nederland

2002	2011	2021
Philips (electronics)	Philips (electronics)	ASML (ICT products)
AkzoNobel (chemistry)	ASML (ICT products)	NXP (ICT products)
ASML (ICT products)	NXP (ICT products)	Philips (electronics)

Source: JRC data, edited by TNO Vector.

are not nearly successful enough in converting that knowledge into scalable solutions. There are two reasons for this.

First of all, the move from university to the market poses a challenge. Dutch universities generate relatively few spin-offs (see Figure 2.5). Although knowledge valorisation is officially the third core task of universities, alongside education and research, researchers are still mainly assessed based on their scientific publications and not encouraged enough to be entrepreneurial.[69] Researchers who want to start a business often face obstacles such as a fragmented support structure with major differences in quality and a rigid attitude on the part of institutions when negotiating the use of intellectual property. That has to change.

Just

21.5%

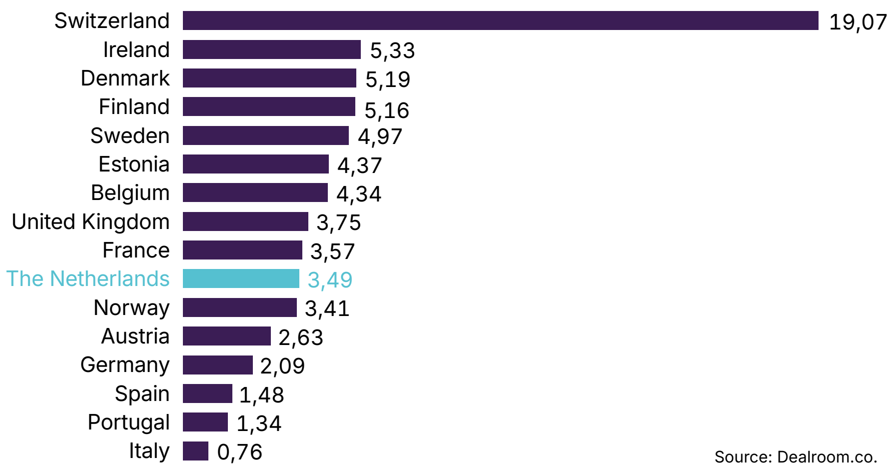
of Dutch startups continue to grow

A second problem is that if innovations do get commercialised, they often lack scale. Our startups grow into scale-ups more laboriously than startups in other countries. While in Germany 40.6% and in the US even 54.1% of startups continue to grow, in the Netherlands that percentage remains stuck at 21.5%.[71] This is a missed opportunity, because it is precisely in the later growth phases that the greatest economic value is created.

The example of quantum technology (one of the aforementioned key technologies, which potentially has great economic impact[72]) illustrates the Dutch 'innovation paradox' like no other (see Figure 2.6). The figures show that the Dutch performance is gradually declining along the innovation chain. The Netherlands excels in scientific output and publication quality: we are responsible for 2.4% of all global publications on quantum technology. The contribution to the global patent portfolio in this area, at 2%, is still reasonably close to the share in publications. The picture becomes less rosy once we look at the share of investments in quantum companies, however, and even more skewed when it comes to the num-

Figure 2.5 Spin-offs founded since 2019 that have raised at least €1 million[70]

Number of spin-offs per million inhabitants



Source: Dealroom.co.

Figure 2.6 Quantum technology illustrates the Dutch innovation paradox[73]

As a percentage (%) of the total worldwide

2.4%	2.0%	1.0%	0%
Quantum publications	Quantum patents	Quantum startup investments	Quantum unicorns

The technology position was determined based on the Patent Asset Index (PAI). This index measures the total value of countries' patent portfolio within a given technology domain, taking into account the number of patents and their quality (based on market coverage and number of citations). The development of the technology position is based on the Dutch share in the global PAI over the period 2015-2025.[1]

ber of unicorns - companies worth more than one billion dollars. There are now 12 quantum unicorns worldwide, but none of them is based in the Netherlands. In short, our investments in knowledge are not yet paying off enough in economic value. This makes Dutch investments in knowledge de facto development aid for countries like Singapore and the US.

2.5. Room for action: The Netherlands remains strategically relevant by choosing technological niches within the four domains

The Netherlands has all the necessary ingredients to remain a relevant player in technology globally. But without targeted interventions, our technological position risks deteriorating further, resulting in a loss of relevance and stagnating economic growth. To avoid this, we must first create competitive economic preconditions to ensure that (new) knowledge can quickly advance to an application in the market. The path from idea to industrial production needs to be radically simplified.

Decisions also need to be made. As a small country with limited resources and various scarcities, we cannot do everything at the same time.[74] The four domains at the centre of this report - digitalisation and AI, security and resilience, energy and climate technology, and life sciences and biotechnology - are crucial for our future prosperity and thus provide a good basis for these choices. Moreover, pre-

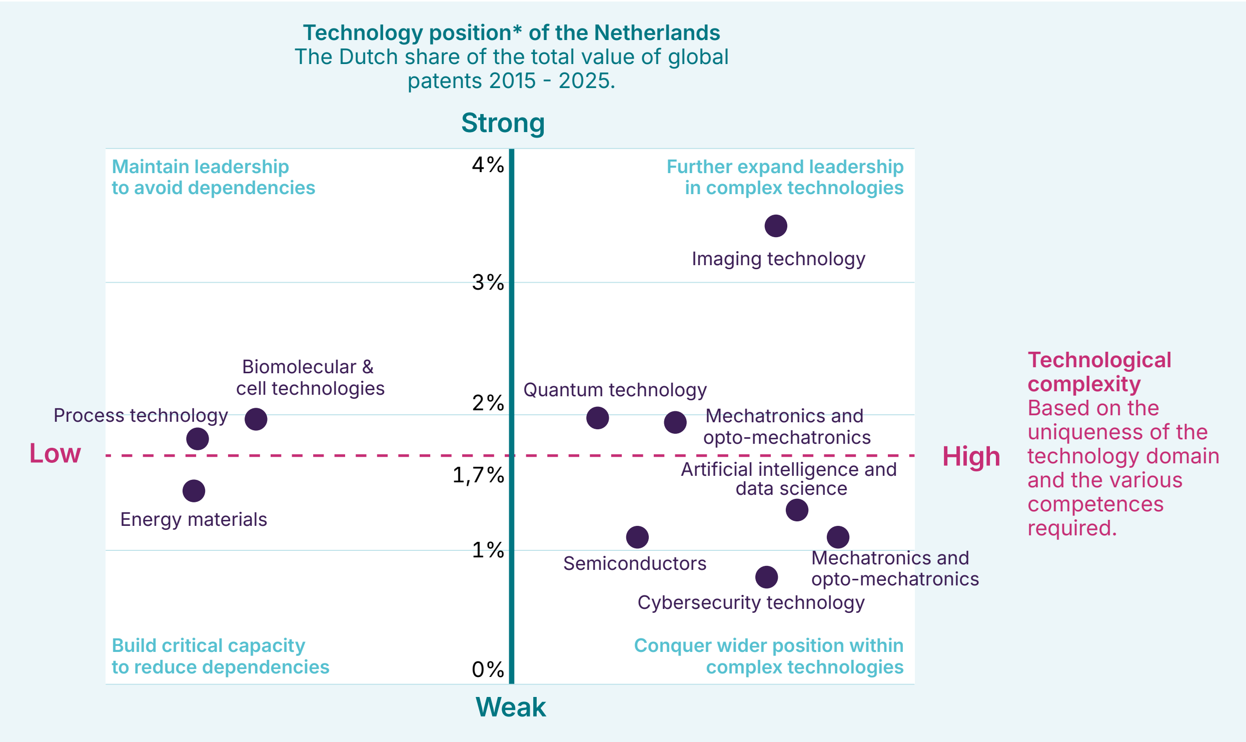
1 The share of quantum publications was calculated based on the number of global scientific publications on quantum in the period 2013 - 2022, the share of quantum patents based on the Dutch contribution to the global quantum Patent Asset Index in the period 2015 - 2025, the share of startup investments based on the funding raised globally for quantum startups and scale ups in the period 2020 - 2024.

cisely because of their societal importance, they represent a great opportunity for innovation and economic growth.

The Netherlands must focus on building a number of high-tech niches within these domains. Just as we already have a unique position in the semiconductor value chain with ASML's EUV lithography machines, which produce the latest generation of chips. Having unique knowledge and applying this knowledge in products, services and production processes will keep the Netherlands relevant on the world stage. More importantly, it will prevent us from having to go along with countries with values that differ from our own.

The National Technology Strategy is a good basis for developing these niche positions.[77] Figure 2.7 shows that the Netherlands has strategic opportunities in all promising technologies, albeit from different starting positions. At the top right are relatively complex technologies in which the Netherlands is already strong. As these are difficult to imitate, they offer a more robust competitive advantage[78] and consolidation of our position is essential. For the complex technologies in which the Netherlands is lagging behind, at the bottom right, it is important to

Figure 2.7 Strategic capabilities of the Netherlands in technologies by complexity and strength[75]



* The technology position was determined based on the Patent Asset Index (PAI). The horizontal dotted line gives the median PAI value. The technology position indicates how complex and unique a technological domain is, based on the different competences it requires.[76]

Source: TNO (2025).

strengthen the position. Within semiconductors, the Netherlands excels in lithography with ASML, but there are also opportunities in other parts of the chain. Nearfield Instruments, for example, is developing metrology machines that check the quality of chips at the nanoscale,[79] broadening the Dutch position in this technology. The technologies on the left are less complex, but still important. Here, we need to maintain our leading positions to prevent crucial knowledge and production from disappearing abroad. Reducing dependencies, for example by building critical capacity in energy materials, is also essential.

Steering for technology positions within the four domains requires political courage, but it is important to realise that 'not choosing' is not an option. After all, failing to make explicit choices means an implicit choice for continuation of the status quo. And that is proving insufficient to ensure our future prosperity. By consciously choosing technological niches in which the Netherlands can distinguish itself - from complex breakthrough technologies to critical, less complex foundations - we can play an important role in Europe's strategic relevance and secure our future prosperity.

2.6. In summary

- Europe is rapidly falling behind in critical technologies compared to China and the US, increasing both economic and geopolitical dependencies.
- To avoid over-dependence on these countries, Europe and the Netherlands must focus on four domains that are essential for our future economy and societal well-being: digitalisation and AI, security and resilience, energy and climate technology, and life sciences and biotechnology.
- Operating from a strong technological starting position, the Netherlands is able to contribute to Europe's strategic relevance. At the same time, the Netherlands is currently losing technological clout as the result of inadequate R&D investments and by not exploiting its existing knowledge base effectively enough. This tide must be turned.
- Within these domains, the Netherlands needs to focus on building technological niche positions.
- Through targeted investments and better economic use of knowledge, the Netherlands can play an indispensable role in international value chains, thereby increasing both its economic and geopolitical clout.

Endnotes

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PART II

WHERE THE NETHERLANDS MUST STRATEGICALLY INVEST

WHERE THE NETHERLANDS MUST STRATEGICALLY INVEST

While Part I showed the need to invest in economic growth and increase technological and strategic relevance, Part II focuses on what the Netherlands needs to do in concrete terms to make that possible. The extra €151 to €187 billion in productivity-enhancing investments that the Netherlands needs will only get off the ground if the Netherlands once again becomes an attractive country in which to innovate, build and scale up. Our technological position also stands or falls on the economic preconditions in the Netherlands. Ultimately, these preconditions determine whether our societal ambitions can become a reality.

€126 billion

Investment potential in the propositions from this report

At present, however, the economic preconditions are insufficient. Roundtables with dozens of businesses, knowledge institutions and financial parties reveal a striking degree of unanimity: people want to invest, but run aground because of preconditions that have structurally deteriorated in recent years. Licensing processes are slow and uncertain, the nitrogen deadlock blocks economic development, and objection procedures can delay projects for years. Access to affordable energy also seriously curbs growth: more than 14,000 businesses are waiting for an electricity connection, while those that are connected pay higher electricity prices than businesses in neighbouring countries. At the same time, shortages of well-trained staff are growing because the Netherlands is not training enough talent in science, technology, engineering and mathematics (STEM talent), discouraging highly skilled migrants and letting educational performance decline. This has made investments not only riskier, but in some cases simply impossible.

Our economic infrastructure is also under pressure. The mainports - the Port of Rotterdam, Amsterdam-Schiphol and Brainport Eindhoven - owe their strength to the convergence of scientific knowledge and industrial competences. Together with our innovation ecosystems, they are places where new technologies are rapidly being developed, tested and scaled up. When these nodes weaken, the Netherlands loses its ability to keep up on the global scale and our capacity for growth structurally declines.

At the same time, the talks with 31 consortia also reveal optimism: as soon as the preconditions are restored, there is investment potential of at least €126 billion waiting in the four domains of this report. And that only involves the projects provided for this report; the underlying potential is considerably larger. This makes one thing clear: the Netherlands does not lack a willingness to invest, it

The task is clear: The Netherlands must once again become a country where investments can come to fruition, technology can flourish and businesses can scale.

lacks investment opportunities. The will to build is there, but the climate to build is not.

The bottlenecks are known, and so are the solutions. Licensing procedures can be made faster and more predictable. The nitrogen deadlock can be broken. The energy supply can become reliable and more affordable again by investing in the power grid and using the existing grid more intelligently. Talent can be nurtured with more focus on STEM, programmes for large-scale upskilling and reskilling and a modern migration framework for knowledge workers. And our mainports and innovation ecosystems could be on the cutting edge again internationally if targeted investments are made in their physical, digital and knowledge infrastructure. In other words, if the Netherlands improves the preconditions, the investment engine can pick up immediately.

The task is clear: the Netherlands must once again become a country where investments can come to fruition, technology can grow and businesses can scale up. This does require that choices be made. Not everything is possible in the Netherlands and it is definitely not possible to achieve everything at once. The preconditions that the government creates for the economy must aim for a high-productivity economy that innovates in domains that are important for society. This also means that certain activities will no longer take place in the Netherlands. Saying goodbye is hard: the old is concrete, the new still unknown. But it is necessary. Our future economic strength, our strategic position and our ability to achieve and finance societal transitions will depend on it.

The next two chapters show how this can be achieved: first, the preconditions which the Netherlands needs to strengthen in order to enable investment, and second, the concrete projects from the investment pipeline which can be realised once these preconditions are in place. This will show how our economy can become stronger and more innovative, thus securing the Netherlands' strategic relevance, future resilience and broad-based prosperity.

CHAPTER 3

The preconditions that enable investment

The Netherlands can achieve its societal goals only if the economic preconditions are geared towards a high-productivity economy. This requires that the Netherlands be a place where investments can take fruition, technology can grow and businesses can scale up. Without these preconditions, growth of at least 1.5% to 2.0% will not be achieved and our technology gap will continue to widen.

3.1. Bring speed and innovation back into rules and licensing

Laws and rules define the political and economic ground rules in a society. Without this framework, an economy cannot function.[1] Promoting competition, trust and stability builds an attractive investment climate. Protection of workers, communities, the environment and intellectual property also promotes broad-based prosperity. The institutional trust the Netherlands has built is of incredible value.

This trust is eroding, however. The government is increasingly failing to serve the social goals of the Netherlands. It lacks boldness, speed and decisiveness. Because of these deficiencies, our growth potential is crumbling and we are not managing to keep up with the speed of technological developments. First of all, the nitrogen deadlock has been creating huge obstacles in licensing procedures for homes and factories for years. And where nitrogen issues can be avoided, licence applications run into complex decentralisation of spatial planning procedures. Due to lack of spatial planning direction, projects of economic and national importance get stuck in long waiting times, complicated applications and protracted objection and appeal procedures. Speed is also lacking in innovation. Regulatory frameworks are not geared to today's technological developments, which inhibits innovation. Commercialisation procedures can take years longer than in other countries, consequently the Netherlands lacks the speed to stay technologically relevant.

The emphasis on procedures rather than on achieving goals undermines the trust citizens and businesses have in the government: are politicians still capable of tackling the major societal challenges of our time?[2] If the government is to regain public support, its rules and processes must again be in the service of achieving goals.[3]

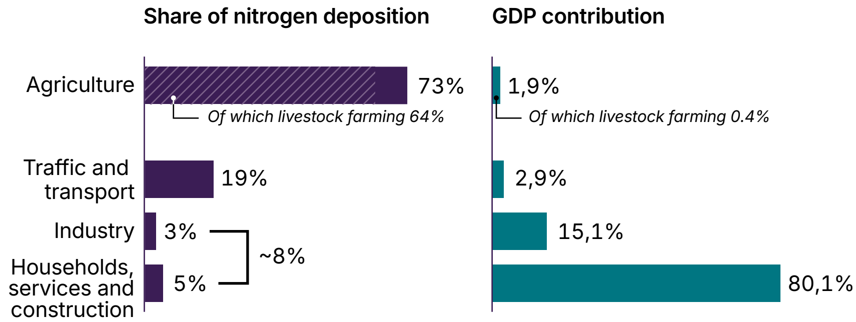
Break the nitrogen deadlock in the Netherlands

The nitrogen dossier illustrates how inaction can lead to impossible situations. The government's failure to act has left the Netherlands suffering the debilitating effects of the nitrogen deadlock on nature permits for more than six years. Because of the poor communication and lack of prospects for the future, mistrust and discontent has arisen on all sides. Johan Remkes' report from 2022, 'Wat wel kan' [What *is* possible][4], aptly portrays that breach of trust. He therefore recommended action: *"What's needed is a targeted short-term approach that actually achieves nitrogen reduction."* This was the only way trust could be restored. Three years later, however, this approach has still not materialised: the problem is getting worse. Precisely what Remkes predicted in his report if no decisiveness on this issue was forthcoming.

Delays and postponements of projects that require a new nature permit are now taking place on a large scale. This is causing enormous damage for construction and industry. The decreased issuing of licences over the 2024 - 2030 period could lead to €30.7 billion in gross turnover losses.[5] This estimate is already outdated, however: the possibilities for using any latitude for nitrogen emissions within existing licences have been further restricted since the Council of State ruling in December 2024.[6] This will sharply increase the negative impact on the economy, which is expected to be a multiple of the €30.7 billion mentioned above.[7] And it is precisely the capital-intensive investments in renewal and sustainability that are losing out due to the lack of nature permits. In the Rotterdam industrial cluster for example, billions in investments cannot take place in the coming years because nature permits are not available. 66% of these investments would have

Figure 3.1 Share of nitrogen deposition in Natura 2000 areas by source

As a percentage (%) of domestic sources in 2023



Source: RIVM, Eurostat.

30.7 billion

The minimum turnover loss in the period 2024 - 2030 as a result of the nitrogen deadlock

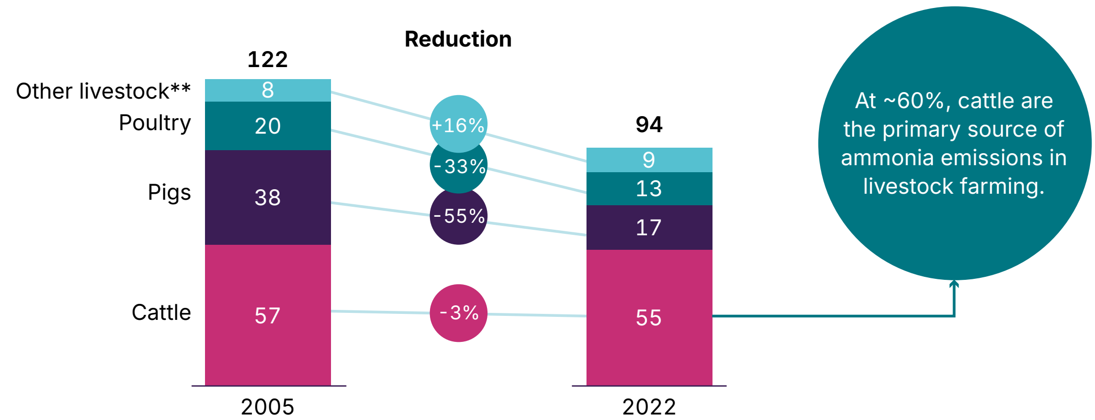
contributed to the energy transition. For instance, the Porthos project to store CO_2 from the Port of Rotterdam has been delayed by a nitrogen case.[8] The nitrogen deadlock thus prevents the growth and sustainability of our society.

Construction and industry thus bear the bulk of the economic costs of the nitrogen crisis[9], but play only a small role in Dutch nitrogen emissions deposited in nature areas. Figure 3.1 shows that at 73%, agriculture accounts for most of the nitrogen deposition in nature areas.[10] Livestock farming, which accounts for only one-fifth of added value in agriculture, accounts for almost 90% of deposition by agriculture. And it is precisely the livestock sector that is achieving little nitrogen reduction. Emissions from cattle, in particular, the largest emitter within the livestock sector, have barely declined over the past 20 years, as shown in Figure 3.2. This is in stark contrast to other sectors: for example, emissions from the industrial and energy sectors and traffic have decreased by 63% and 40%, respectively, since 2005.[11]

Difficult choices have to be made, therefore. Agriculture makes a major contribution to the Dutch economy and society both directly and indirectly via the wider agri-food complex, and deserves concrete prospects for the future. But major changes are needed within agriculture, especially in cattle farming. Both national measures, such as buyout schemes, and area-specific measures, such as nature restoration, are necessary to deal with this crisis.[12] But only if these measures are backed by concrete, mandatory targets and swift and decisive implementation will we get the Netherlands out of this deadlock.[13]

Figure 3.2 Ammonia emissions from livestock farming

Between 2005 and 2022, in kilotonnes of ammonia*



* Nitrogen deposition or precipitation in Dutch nature areas consists of ammonia (primarily from agriculture) and nitrogen oxide (primarily from traffic and industry).

** Contains sheep, goats, horses & ponies, rabbits & fur animals.

Source: CLO, CBS, Ministry of Agriculture, Fisheries, Food Security and Nature / CBS Statline (2025). Agrimatie Wageningen Social & Economic Research (2024) / RIVM (2025). Monitor of nitrogen deposition in Natura 2000 sites. Emissions registration.

And that must be done, because the consequences of not acting are simply unacceptable. New businesses cannot start up and existing businesses cannot develop. Sustainability projects stall because they cannot get a nature permit. The economy of tomorrow is lagging behind. The Netherlands needs to implement a comprehensive strategy on the nitrogen dossier as soon as possible, and agriculture needs concrete prospects for the future as soon as possible. The possible solutions for this challenge have been thoroughly explored and recorded: the one thing lacking for this dossier is the decisiveness that is required to make tough choices.

The crisis of the future: clean water

A crisis is better avoided than solved. The Water Framework Directive (WFD) has the potential to deadlock licensing in the Netherlands again. Not one of the 745 surface water bodies that must by law be in good condition by 2027 under the WFD is currently in order. Concentrations of PFAS, among other chemicals, are often far too high. If this is not addressed with sufficient urgency, the Netherlands will soon have another structural problem with nature permits and, not unimportantly, no clean water.[14,15]

Not a single surface water body in the Netherlands meets the requirements of the Water Framework Directive.

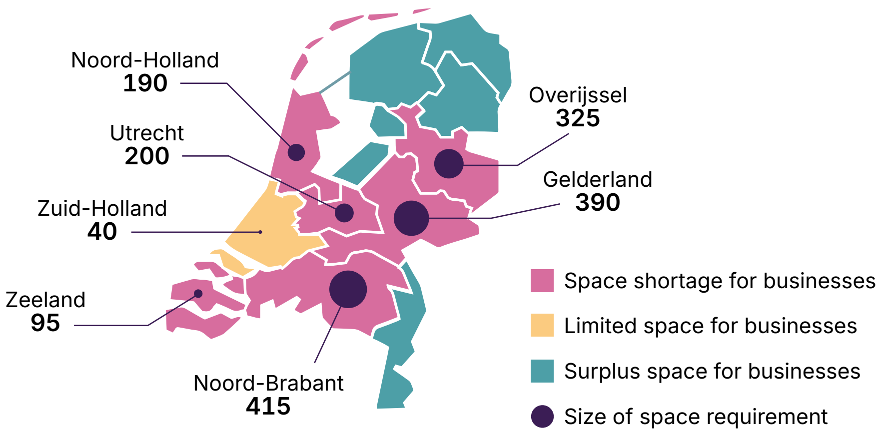
Give the Dutch economy room

It is not just the nitrogen deadlock that is hampering new investments in the Netherlands. Building in the Netherlands, be it housing, factories or infrastructure, is a long, complex process. There is scarce room for businesses: for both domestic and foreign entrepreneurs, finding a plot is an obstacle.[16] In regions like Utrecht and Brainport Eindhoven, there are no new plots available at business parks for logistics or large-scale industry. If the current trend continues, by 2030, new plots for businesses will be sold out in six of the 12 provinces, as shown in Figure 3.3.[17] Since developing business parks often takes a minimum of seven years, space for Dutch businesses will become increasingly limited without swift action.

The scarcity of space for businesses is a choice. 66% of Dutch land is used for agriculture, a much higher percentage than in Belgium or Germany, for example, where this figure is around 50%. Less than 3% of Dutch land is used by businesses, which, however, do create the vast majority of economic value. Space for business activity, especially around innovation clusters, has to be safeguarded for growth. Converting a small percentage of the agricultural land to space for businesses and energy infrastructure will enable the rest of the economy to develop again for many decades, leaving more than enough space for a healthy and productive agricultural sector. Dutch land is scarce, and this scarce space needs to be better distributed to achieve at least 1.5% to 2.0% structural growth.[18]

Figure 3.3 Space available for businesses in 2030, by province[19]

In hectares



3%

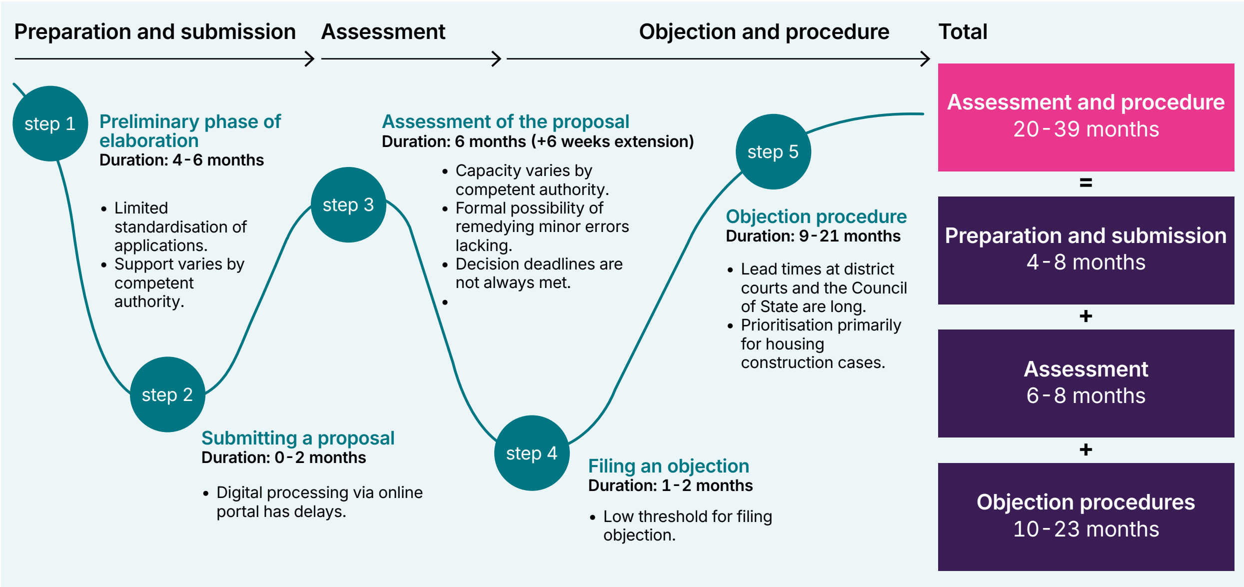
The Dutch business sector uses only a small percentage of our land, where the vast majority of economic value is created

For businesses that have managed to secure a location, obtaining planning permission is a lengthy and complex process. There is currently great variety in the structure, formulation and detailing of spatial planning procedures between municipalities.[20] Licences are anchored in the *Omgevingswet* [Environment and Planning Act] and each municipality makes its own Environment Plan for this purpose. That customisation within municipalities has a function: urban Rotterdam logically has different spatial planning needs than nature-rich Mook en Middelaar. Many municipalities are moreover actively engaged in shaping licences carefully and in cooperating with local stakeholders, which actually adds value in complex living environments. But municipalities now also provide customisation where it is not needed, for example for issues such as pipes and cables. This lack of uniformity is not due to the law itself: nowhere in the Environment and Planning Act does it say that the structure and parts of municipalities' environment plans may not be uniform; that is how it has been implemented, however.

Developing these environment plans takes a huge amount of capacity at municipalities, therefore. That time and expertise of the municipal apparatus subsequently cannot be used to support citizens and businesses with their licence applications.[21,22] Customisation also creates a lot of extra work for people and businesses who have to navigate the unique rules of all these municipalities. The lack of a uniform approach on key topics thus creates extra work, delays, growing administration and a quagmire of complexity.

These issues manifest themselves in every step of the process, as Figure 3.4 shows for industrial licences. Before a licence application can be submitted, additional research is often required in addition to the standard application. Many regulations are still evolving and specific rules of a municipality or province in relation to the land can lead to a laundry list of additional requirements, tests and studies. From archaeological surveys to flora and fauna inventories, these requirements easily take months to complete.

Figure 3.4 Process and duration of the various steps in the application for planning permission for an industrial business



Source: Central government, IPLO, Environment and Planning Act, Council of State, STOER, Gemeente.nu, Environmental Information Point.

The environment and planning permit is then submitted. This process is generally predictable if an application fits well with the set frameworks and takes eight to 12 weeks.[23] This is a relatively long period of time seen from an international perspective: in China and the US, the median application takes less than two weeks. Moreover, for complex applications, the licensing can take more than six months. As such, it can easily take a year before a licence is granted. After that, there can still be significant delays in the objection and appeal procedures. These are long, intensive processes that can advance as far as the highest administrative court in the Netherlands, the Council of State. The delays caused by these procedures are a widespread problem - residential construction, electricity infrastructure, factories and data centres all suffer from protracted procedures.

In the municipality of Amsterdam, for example, one couple with unfounded objections held up the construction of hundreds of homes for years, resulting in tens of millions in damages.[24] In Eindhoven, too, two objectors held up the construction of an underground bicycle parking garage for almost three years until the municipality decided to proceed without waiting for the Council of State's ruling.[25] The delays caused by these procedures are worsening: the Spatial Planning Chamber of the Council of State, which rules on objections in spatial planning in the Netherlands, has seen the number of pending proceedings more than double since 2020.[26]

In Europe, more people now work on complying with rules than on innovative research.

It does not have to be this way: the rapid construction of the LNG terminal in Eemshaven shows that an active role for the central government in matters of national importance can lead to considerable acceleration. All processes as well as construction were completed in just 200 days.[27] A temporary exemption certificate was issued to allow construction to proceed in parallel with licensing procedures. On strategic themes, the national economic interest must weigh heavily and licensing procedures must be accelerated. Such exceptions cannot be applied everywhere, but expedited procedures can also be implemented more broadly. In housing, for example, this is done with the *Wet Versterking regie volkshuisvesting* [Enhanced Governance Powers (Public Housing) Act], which restricts appeal and objection procedures and which saves up to a maximum of one year. Such legislation can also bring speed and scalability back to the process of environmental and planning permits for businesses and is therefore of enormous importance. The Netherlands simply cannot get bogged down in its own processes.

Regulations hinder investment security and scale-up

Besides planning permission, all too often state aid reviews, procurement procedures and commercialisation licence applications take up too much time and capacity. In Europe, more people now work on complying with the rules (3.9% of the population), than on doing innovative research (1.7%).[28] Administrative processes take longer and longer due to an accumulation of procedural steps, which has taken the speed out of the Dutch and European economy. This lack of speed directly affects our potential for innovation and hence our strategic relevance. In the high-tech sectors where the Netherlands wants to compete internationally, the market is moving extremely fast.

Long lead times for commercialisation therefore lead to insurmountable backlogs. For instance, the *EU Novel Foods Act*, which tests whether new food products can be admitted to the European market, has an average lead time of more than 2.5 years - disastrous for innovative businesses in, for instance, the protein transition. Testing and approval of new medication also takes up to 40% longer in Europe than in the US.[29] For young, small businesses, which often do not have the capital buffers to wait an extended period of time, these slow processes can spell the end of the business. Regulations can back innovative businesses into a corner: besides slow licensing procedures and procedures for commercialisation, they are often not allowed to receive state aid because they are defined as an 'undertaking in difficulty'. For instance, a fast-growing startup or scale-up that is investing heavily in order to grow can already be labelled as 'in difficulty' precisely because it is doing what an innovative business is supposed to do.

These regulations are causing us to miss out on opportunities: precisely those businesses with groundbreaking propositions are being excluded because it often takes them longer to become profitable. The risk-averse policy culture in the Netherlands also means that the boundaries of European regulations are not being pushed, for fear of proceedings on the European level. In the Netherlands, both legislation and implementation are calibrated entirely to procedural correctness, rather than achieving societal goals.

Another problem is the excessive distance between legislators, regulators and (innovative) businesses. Technology is often developing faster than the frameworks these days, leading either to a braking reflex or to societal harm due to lack of legislation.[30] The frameworks and the supervision need to become future-proof. They need to be able to respond to disruptive innovations, to quickly give innovative propositions clarity on the legislative frameworks in which they operate. This ensures investment security and protects society. Regulatory sandboxes can help achieve this ambition. These are structured environments in which innovative technologies such as AI or self-driving cars can be tested in close cooperation with regulators. Although the EU explicitly allows for this, the Netherlands still makes very little use of this possibility.[31] This does take place in other member states: Portugal has allowed supervised testing of self-driving vehicles around Lisbon and Porto by giving vehicle operators a temporary exemption from road traffic laws and liability rules.[32]

France tested several applications, as shown in Figure 3.5, including a test zone in which 5G applications could be experimented with.[33] The untapped potential of regulatory sandboxes in the Netherlands clearly illustrates this is not just a problem stemming from European legislation - the Netherlands also needs to take action.

Figure 3.5 Three examples that made the French sandbox model possible

	Wastewater reuse in agriculture	Artificial intelligence and data	Telecommunications and 5G
What was made possible?	Agricultural businesses were temporarily allowed to use treated wastewater for irrigation and fertilisation of crops, which is normally prohibited under French environmental legislation.	Businesses were allowed to test artificial intelligence applications that processed personal data under simplified reporting and consent requirements.	Businesses were given temporary licences to use 5G frequency bands outside the regular licensing procedures.
How does it deviate from existing regulations?	Temporary exemption from the prohibition in the Code l'Environnement on the use of wastewater for agricultural purposes.	The CNIL* provided interpretative latitude within European and French privacy laws to test AI applications and granted accelerated approval for experiments where the application of rules was still unclear.	Exemption from the commercial licensing requirement in the Telecommunications Act, approved by ARCEP**.
How does it work in practice?	The Ministry of Agriculture and Public Health, under the framework of France Expérimentation, granted permission for derogation, with monitoring of public health and environmental impacts.	The CNIL** granted approval to combine datasets that normally had to remain separate, as long as there was a risk management plan and transparency provision beforehand.	ARCEP* established temporary test zones, with limited geographical coverage and real-time monitoring, allowing experiments with 5G applications to take place safely.
What was the effect?	The pilots resulted in structural adjustment of environmental regulations and acceleration of circular water projects.	The sandbox sped up AI development and provided input for the EU AI Act, but remained small-scale due to legal uncertainty about data sharing.	The sandbox accelerated innovation in 5G applications for smart cities and industrial networks, and the results were used in the national rollout of 5G.

* *Commission nationale de l'informatique et des libertés* - the relevant data privacy regulator
** *Autorité de Régulation des Communications Électroniques, des Postes et de la Distribution de la Presse* - the relevant regulator of the Telecommunications Act.

The gold-plating of European rules and the further narrowing of these frameworks by national regulators creates major limitations in the scalability of European businesses.

A similar dynamic also applies to how member states, including the Netherlands, deal with European rules. The gold-plating of European rules and the further narrowing of these frameworks by national regulators creates major limitations in the scalability of European businesses. The Waste Framework Directive is interpreted differently in each member state, for instance, which means no market for secondary raw materials can be created. In France pyrolysis oil, which is used as a biofuel, is classified as a raw material, whereas in the Netherlands it is legally still classified as waste - with all the additional requirements that entails. Standards around harmful substances even vary by province,[34] making the playing field even more complex.[35] The Netherlands also often conducts stricter supervision than surrounding countries with respect to the same legislation. This can be far-reaching: the Dutch Personal Data Authority (AP) has, for example, even been taken to task by the European Court of Justice for interpreting the privacy law too strictly.[36] The ACM was the only one in Europe to abolish the volume discount for bulk users of electricity, putting our industry on an uneven playing field with the rest of Europe.[37] These differences make the Netherlands unappealing and prevent a European single market from materialising.

The trade costs of these and other differences in legislation between member states are equivalent to an import tariff of 44% for goods, and 110% for services within the EU. That is three times higher than inter-state trade barriers within the US.[38] In practice, this means that Dutch companies find it difficult to scale, which hurts our productivity growth.[39] Aligning national regulation and supervision with broad EU standards, for example with the EU Inc. proposal for uniform corporate structures, does require guts. Weakening certain national standards poses potential risks. It also requires creativity: where the EU cannot reach consensus, the Netherlands must create a vanguard with surrounding countries to lead by example. Harmonisation is not easy, but the cost of inaction is many times greater.[40] Europe must complete the single market to meet its growth and sustainability ambitions. Every member state must play its part in this. And we must dare to take the lead.

Conclusion and recommendations

The risk-averse reflex of the Dutch government means that following procedures is presently given more attention than achieving societal goals. In order to strengthen Dutch competitiveness and make progress on the major societal transitions, a new balance has to be found in this regard. If the Dutch government is to achieve productivity growth and strategic relevance, it must first and foremost return to serving these goals. The Netherlands must take the lead in Europe in making this turnaround.

1. Force a breakthrough in the nitrogen dossier

- Follow the vision in the Remkes Report (2022) to provide a structural solution to the nitrogen problem. Draw up a plan immediately incorporating, at the very least, concrete, enforceable targets, an ambitious timeline and sufficient budget for restructuring livestock farming and nature restoration so that nitrogen reduction is legally anchored.

- Immediately in 2026, start with both voluntary and mandatory measures at local and national level to get licensing moving. Dare to make difficult choices straightaway, for instance with mandatory buyouts.

2. Provide space for business development.

- Take back national control of projects that are of great economic and strategic importance to the Netherlands. Designate sites for this purpose and implement temporary exemption structures for parallel construction and licensing.
- Require municipalities to issue sufficient land for businesses.

3. Shorten licensing procedures and ensure consistent environmental and planning rules

- Anchor national control over key economic themes and projects in law, via a targeted amendment to the Environment and Planning Act or a separate acceleration scheme for crucial projects, to create the necessary acceleration to achieve structural growth of at least 1.5% to 2.0%.
- Ensure uniform application of the Environment and Planning Act and speed up licensing procedures by widely applying national frameworks and successful regional best practices. Where municipalities and regions cannot achieve the necessary speed, the central government must be able to intervene to speed up decision making.
- Treat space for businesses similar to housing construction. Here, too, limit the duration of appeal and objection procedures and implement a Businesses Governance Act to shorten the processing time for licences for businesses.

4. Revise regulatory frameworks with a view to innovation

- Use regulatory sandboxes to encourage innovation in socially important sectors. Ensure enough capacity at regulators to support this.
- Get rid of the gold-plating of EU regulations. National legislation should not do more - or less - than EU regulation, and opt for burdenless transposition to national law. Work with neighbouring countries to accelerate integration and harmonise legislation on topics of strategic importance.
- Immediately move away from the strict accounting application of the definition of ‘undertaking in difficulty' in the granting of state aid and apply a proportionality test for starting scale-ups. Like other member states, utilise the maximum room for interpretation and exceptions within the legislation and take the lead at EU level in modernising these definitions.

5. Prevent new barriers

- Prevent that businesses, housing construction and other projects run aground due to the Water Framework Directive in 2027. Draw lessons from the nitrogen dossier. Map out the risks and move quickly and decisively in working on a legally anchored solution.

3.2 Choose talent that enables the needed economic growth and technological relevance

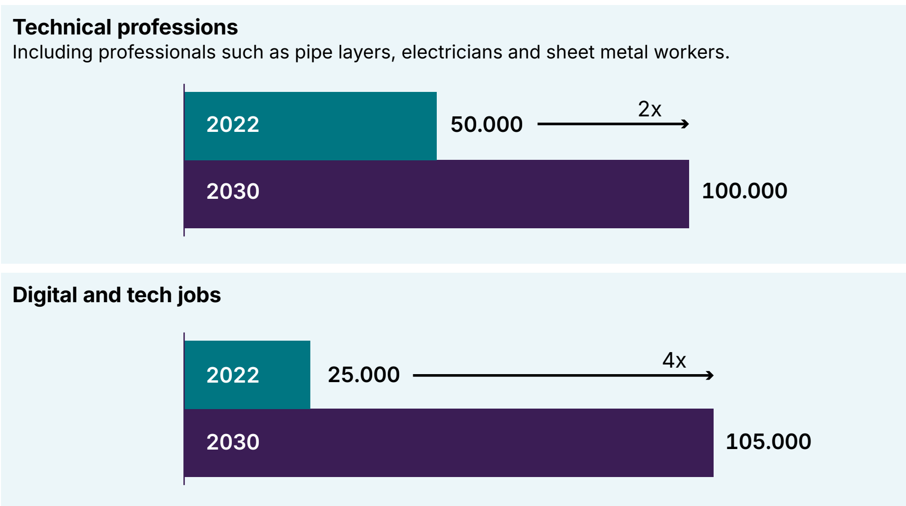
The current policy on, and the investments in, Dutch talent are insufficiently effective, partly due to a lack of clear guidance and coordination.

The Dutch labour market requires fundamental changes. As discussed in Chapter 1, because of our stagnating labour force, our economic growth has to come almost entirely from productivity growth. This is sorely needed to pay for our social services: In 15 years' time, the Netherlands will have only two people in work for every person receiving state pension (AOW), compared to seven to one when the state pension was introduced.[41] Labour is scarce, and labour scarcity is disproportionately high in those sectors where our greatest growth potential lies. Figure 3.6 shows that technical and digital talent, from electricians to programmers, is only getting scarcer. Without this technical and digital talent, we cannot make any progress in the crucial technological domains described in Chapter 2.

As a result of this, we are in danger of falling behind economic powerhouses like China, which invest heavily in attracting and developing talent. Countries like South Korea and Singapore are also pursuing explicit strategies aimed at developing and attracting talent, ranging from massive investments in AI training to programmes that actively attract top international talent. The current policy on and the investments in talent are insufficiently effective, partly due to a lack of clear guidance and coordination. We are unable to move quickly in training and retraining talent to the skills needed now. Without a drastic change in our approach to talent, the Netherlands will not be able to meet its societal goals.

Figure 3.6 Expected shortages in technical and digital jobs in the Netherlands[42]

2022 compared to 2030, number of jobs



Source: McKinsey (2025). Sustaining a Dutch labor market that works for all.

The decline in the quality of our education is disguised by increasingly easy exams.

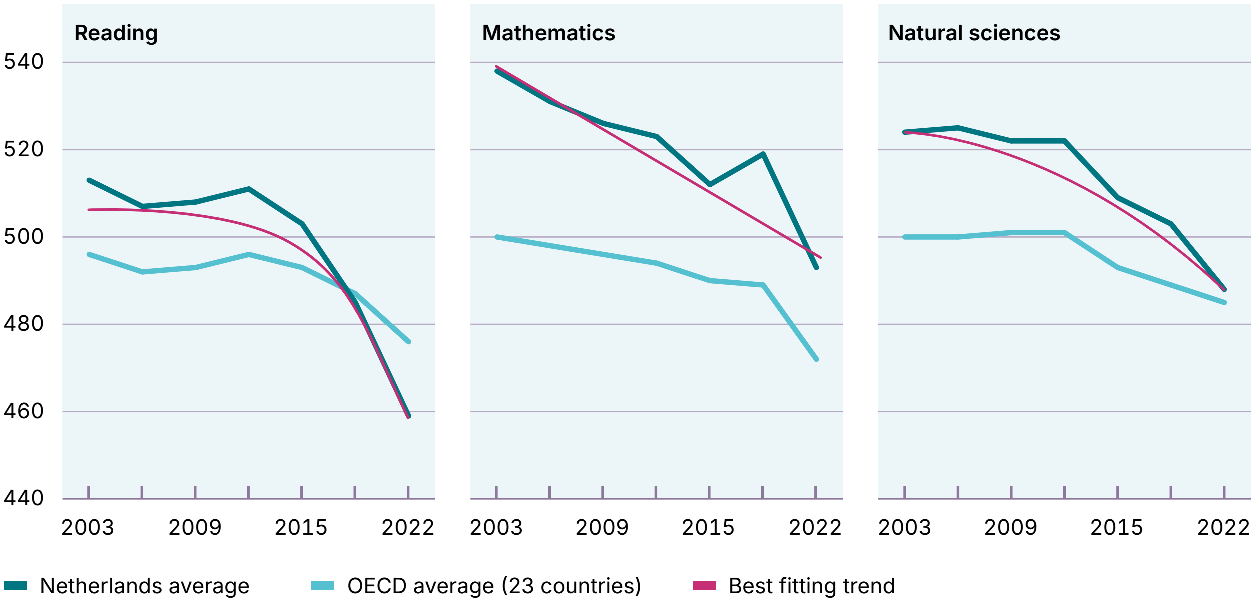
We are losing our educational base

Just when the Netherlands most needs a highly productive workforce, one of the strongest determinants of productivity, the quality of education, is falling.[43,44] Although government expenditure on education has increased as a percentage of GDP since 2000,[45] our educational performance has in fact declined sharply over the same period, as shown in Figure 3.7. Dutch young people perform increasingly poorly in reading, maths and science, both compared to previous generations and to their international peers[46]. The drop is particularly large among pupils in prevocational secondary education: two to four times higher than for pupils in senior general secondary education and preuniversity education.[47] This drop in performance is disguised by ever-simpler exams. In maths and physics, 40-50% less material is now tested than 30 years ago, and the difficulty level of the questions has also dropped. This means that examination marks in Mathematics A, Mathematics B and Physics have increased by 0.7 points on average, but our students' knowledge is rapidly declining.[48] We are simply not aiming enough for excellence.

Improving education starts in the classroom. Too little is being invested where it counts in the Netherlands, such as in training for teachers and school heads. Because there are limited opportunities for advancement in their jobs, top teachers disappear into management positions or consulting firms for career prospects. And those who continue teaching in the classroom are drowning in

Figure 3.7 The development of Dutch 15-year-olds measured in PISA scores (Programme for International Student Assessment) since 2002, compared to the OECD average[49]

In PISA score points



Source: OECD (2023). PISA 2022 Results (Volume I). The State of Learning and Equity in Education.

> "The foundation of our economy is people: their hard work, their talent and their skills. Competitiveness today is less about wage costs and more about employee knowledge."
>
> – Ursula von der Leyen, President of the European Commission

China now has twice as many STEM graduates per year than the US, EU and Japan combined.

paperwork. Primary school teachers spend an average of six to eight hours a week on administration, which is almost twice as much as in the United Kingdom (UK), Belgium and Australia.[50] The bureaucracy in education is growing, but performance is falling.

A second problem is the proliferation of teaching methods with poor effectiveness which have emerged under the guise of decentralisation and freedom of education. Freedom has too often slipped into lack of commitment, which jeopardises students' basic skills. In the absence of a central vision, that role is filled externally: the number of education consultancies has increased sevenfold since 2007. The Netherlands now has more than 60,000 educational advisers, on a total teacher population of 240,000.[51] Even the Education Inspectorate explicitly calls for more central direction.[52] The government must work with teachers and school administrators to take back the reins. More than €50 billion, more than the total GDP of Latvia, goes to education every year in the Netherlands. This money is too often not used effectively. A strong focus on quality is therefore needed again. Investment must not be spread evenly but deployed where it is most needed. Otherwise, every year exams will get simpler and grades higher, but every year the quality of education our children receive will get a little lower.

An acute lack of technically skilled talent

Besides the overall quality of education, training STEM (science, technology, engineering and mathematics) talent specifically lags behind. The Netherlands is in the European rearguard when it comes to intake in technical and digital studies, from secondary vocational education up through university education.[53] Young people do not get enough exposure to engineering in primary and secondary schools, so they are less likely to choose a technical degree programme.[54] This is specifically a concern among women: only one in three STEM graduates is a woman, and only one in five ICT specialists.[55] In addition, it is financially challenging for all levels of education to offer relatively expensive, technical degree programmes.[56] This leads to badly needed degree programmes having to artificially reduce their intake, for example with enrolment restrictions.

This problem is also reflected in the statistics. The Netherlands educates a lot less STEM talent than the European and OECD average. As Figure 3.8 shows, Germany now trains almost twice as much STEM talent as the Netherlands, in relative terms. China, too, now has twice as many STEM graduates per year (3.5 million annually) than the US, EU and Japan combined.[57] Recent figures for the Netherlands do not inspire optimism either: in higher professional education, 7.5% fewer students started a technical or digital degree programme this year.[58]

Entire professional groups, such as administration, logistics planning and data processing are at risk of being automated in the coming years.

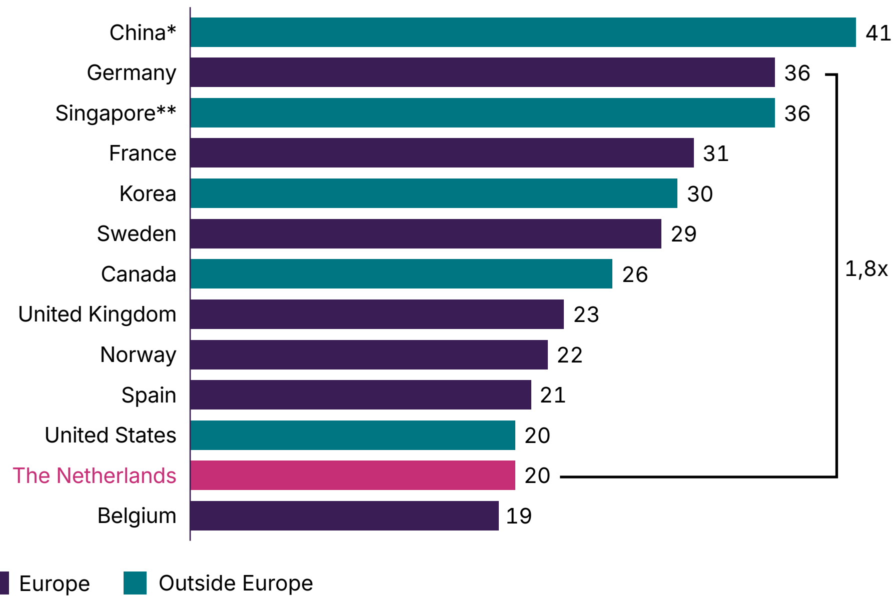
Without STEM talent, we are throttling our high-tech sectors. As a result, our productivity falls and we lose our position in technological value chains. Through more direction and (financial) incentives for technology degree programmes, the Netherlands must improve its STEM foundation and thus its competitive position.

A forward-looking learning culture is failing to materialise

However, Dutch classrooms are not the only place it is going wrong. Workers are not acquiring enough new skills and too little is invested in reskilling them. With today's demographic and technological trends, this poses an enormous problem. Talent is becoming increasingly scarce, so we need to do more with the people we have. At the same time, AI is radically changing the nature of work. Entire professional groups, such as administration, logistics planning, and data processing are at risk of being automated in the coming years. 30% of the hours currently being worked are under pressure from automated processes between now and 2030.[60] ING and ABN Amro combined, for example, already expect to cut thousands of jobs due to the rise of AI.[61,62] But the news for the labour market is not all bad: AI will also create many new jobs - jobs in engineering, ICT and healthcare. Upskilling, to seize the opportunities of AI, and reskilling, to ensure that people can quickly find new jobs in a promising sector, are therefore crucial for the future of our talent. It ensures that the benefits of these new technologies will not just land with a small group of people, but can be widely shared. Automated processes increase prosperity, but the disruptive effects of these

Figure 3.8 Share of STEM graduates in higher education, by country[59]

As a percentage (%) of the total number of graduates



* Data for China concerns 2020 via the Center for Security and Emerging Technology (CSET Georgetown), based on OECD.

** Data for Singapore concerns 2023 via UNESCO.

Source: OECD, CSET, UNESCO.

While countries like Singapore and the United Kingdom are preparing their workforce for a rapidly changing economy, initiatives on the same scale lag behind in the Netherlands.

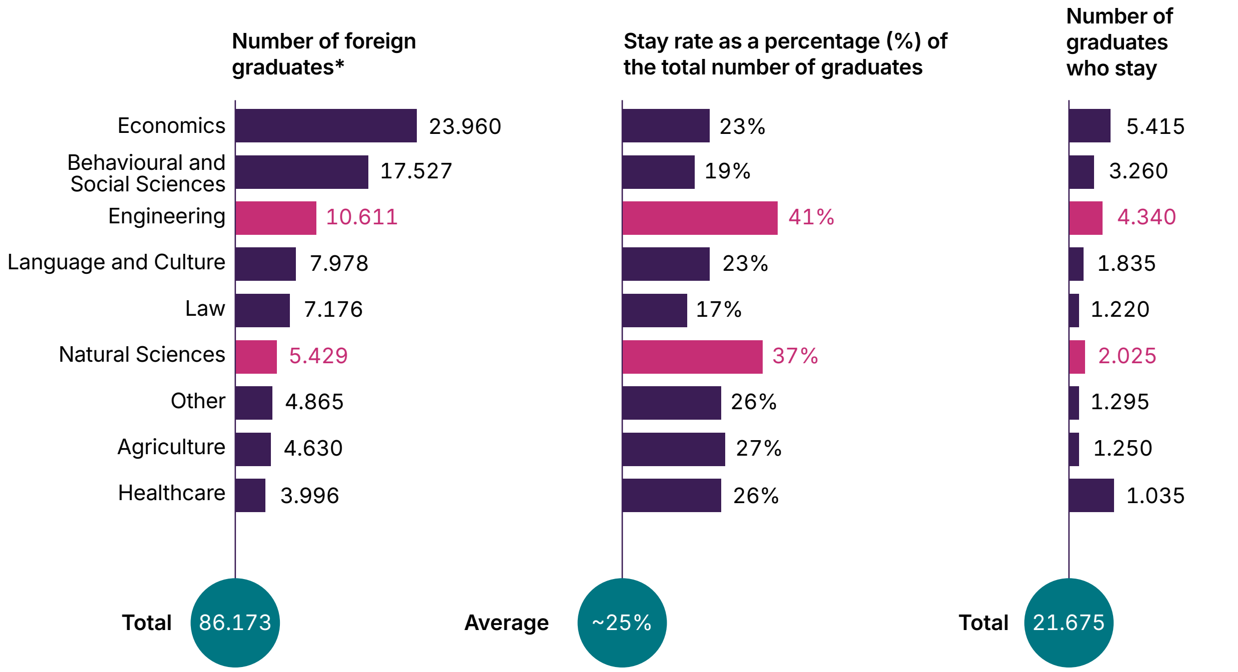
changes must be managed by offering people new opportunities in new sectors.[63] And it is precisely the groups where the biggest transition is needed - those with an intermediate level of education, the self-employed, small employers - who take little to no advantage of reskilling opportunities. While countries like Singapore and England are preparing their workforce for a rapidly changing economy with national reskilling and upskilling programmes like Skills Future and Skills England, initiatives on the same scale lag behind in the Netherlands. Our learning culture needs to change.

We desperately need international talent

Besides strengthening our existing workforce, the Netherlands must remain attractive as a place to settle in the global competition for talent. Particularly top talent with a technical, digital and entrepreneurial background is essential to enable innovative companies to compete internationally. The growth in the number of STEM students in the Netherlands in recent years has come exclusively from more foreign talent. However, international students are now being actively refused under the motto of savings, even though the average foreign student brings on balance tens of thousands of euro to the Netherlands' coffers.[64] International STEM talent must be actively recruited, especially since an above-average share of them stay in the Netherlands after their studies, as Figure 3.9 shows.

Figure 3.9 Foreign students who stay in the Netherlands for 5 years after graduation

Based on graduation cohorts 2014 to 2019



Source: Nuffic.

In the short term, international professional talent is the only viable solution to solve acute shortages in various sectors. However, we see that the Netherlands is becoming increasingly less attractive in that respect as well: the influx of knowledge workers from outside the EU has decreased by 39% since 2022.[65] Our social climate is becoming increasingly hostile and tax schemes for knowledge workers, such as the 30% ruling, are being scaled back under continuous political pressure.[66,67] The migrant workers we do currently attract in large numbers are mainly working in low-productivity sectors where many abuses take place. The Netherlands needs to start attracting talent more selectively; talent that fits the societal transitions the Netherlands is facing.[69,70] Because for the challenges of the future, we desperately need knowledge from abroad.

Balance security and flexibility

Finally, there is one more crucial factor hampering the Dutch labour market: our social security system. This system was designed for the labour market of the last century, and it falls short on both security and flexibility. Permanent contracts are too rigid, flexible contracts are too insecure. Reorganisations are thus more than five times more expensive in the Netherlands than in countries with more flexible systems,[71,73] and temporary workers do not have enough security to invest in themselves. The Netherlands is also a European outlier in sick pay: while in countries such as Sweden, Belgium and Germany employers are only responsible for continuing to pay salary for two to six weeks before the government takes over this responsibility, in the Netherlands employers must continue paying for two years.[74]

The Netherlands needs to move towards a social security system with a broad social base that is better suited to the current and future economy and society.

These high costs and an outdated social security system inhibit innovation, talent redistribution and business growth. SMEs, start-ups and scale-ups in particular are hard hit by this.[75] They need to be able to scale up quickly, attract expertise and adapt their organisation to market dynamics. In current practice, they get bogged down by regulations, costs and uncertainty.[76] At the same time, Scandinavian countries show that flexibility and security are not contradictory: modern flexicurity models increase labour mobility and productivity, while maintaining social security.[77] The Netherlands needs to move towards a social security system with a broad social base that is better suited to the current and future economy and society.

Conclusion and recommendations

The Netherlands needs everyone. Politicians must make sharp strategic choices to ensure that everyone can receive a good education and have opportunities on the labour market. Only with structural changes can we ensure our talent matches up with our social ambitions. A National Talent Agenda must set out comprehensive policy on the labour market challenges facing the Netherlands. It must include at least the following five elements:

1. Require excellence in education

- Focus clearly on quality throughout the education chain. Offer less freedom in crucial subjects such as basic skills and mandate the use of teaching methods that have proven to be effective. Anchor this in the supervisory framework.
- Invest in a targeted manner on quality improvement. Start with training for teachers and school heads. Strengthen career opportunities for excellent teachers, especially in prevocational secondary education.
- Halve the administrative burden in education.

2. Prioritise the supply of STEM talent

- Embed engineering and technology and digital literacy in primary and secondary school curricula. Specifically, ensure that girls and women are encouraged in technical and digital interests.
- Increase structural funding for engineering and technology in all levels of education, from secondary vocational education through to university. In doing so, ensure that STEM degree programmes can reduce or eradicate enrolment restrictions and increase the quality of the programme.
- Set a concrete target for the availability of STEM talent. Then, via funding and policy, steer talent supply so that it matches what the economy needs to staff its high-productivity sectors.
- Reduce intake in degree programmes with limited labour market potential and social benefits.

3. Attract international talent that is geared to the challenges facing the Netherlands

- Invest in an active and targeted migration and settlement programme that encourages foreign talent to come to the Netherlands and stay and work here. Focus this effort mainly on sectors with the biggest shortages, such as engineering, ICT, energy and biomedical technology, and discourage low-productivity labour migration.
- Maintain and broaden tax benefits for knowledge workers, such as the 30% rule.
- Make it financially attractive for non-EU students to follow STEM degree programmes here.

4. Anchor upskilling and reskilling structurally in our labour market

- Create public-private training programmes so that reskilling is better geared to the demand on the labour market. Pay specific attention to sectors with shortages of workers and productivity-enhancing skills such as digitalisation, AI implementation and process innovation.
- Make reskilling and upskilling fiscally attractive to employers and employees in the same way this is currently done for R&D.
- Establish regional productivity centres that support SMEs in technology adoption and implementation, so that new developments are applied better and quicker in the business sector in every region.

5. Revise the social security system to meet the challenges of the 21st century

- Introduce a modern 'flexicurity' model that gives businesses room for agile and innovative business operations, without workers losing their fundamental social securities. In developing this, ensure broad support with social partners. Scrap the second year of continued sick pay by employers.
- Reform the transition allowance received upon dismissal. Link it to the development of a fiscally appealing personal development budget so that people work or learn.
- Focus the use of work-to-work pathways on critical shortage sectors such as healthcare, ICT and engineering.

3.3 Ensure access to affordable energy

Energy is a basic requirement for our society and economy. Since the industrial revolution, access to affordable energy has been a determining factor behind the increase in prosperity and economic growth. But our energy supply is now under stress. Given the need to make our economy more sustainable, we are simultaneously working to electrify the economy and making the sources of this electricity more sustainable. To this end, the Netherlands is building one of the largest offshore wind programmes in the world with 21 GW of installed capacity by 2032 - enough to cover 75% of current Dutch electricity consumption.[78] However, the power grid has not changed fast enough to accommodate both the changing supply and demand side, which has resulted in acute grid congestion. More than 14,000 businesses and organisations are waiting for an electricity connection.[79] Businesses that do have a connection pay more for it than in surrounding countries, and up to 60% more than competitors in China and the US. Our energy-intensive industry is under severe pressure as a result. Strategic sectors in this industry are leaving to countries with lower renewable energy ambitions, harming our economy in the process, increasing our strategic dependence and getting in the way of the reduction of greenhouse gas emissions globally.

14,044

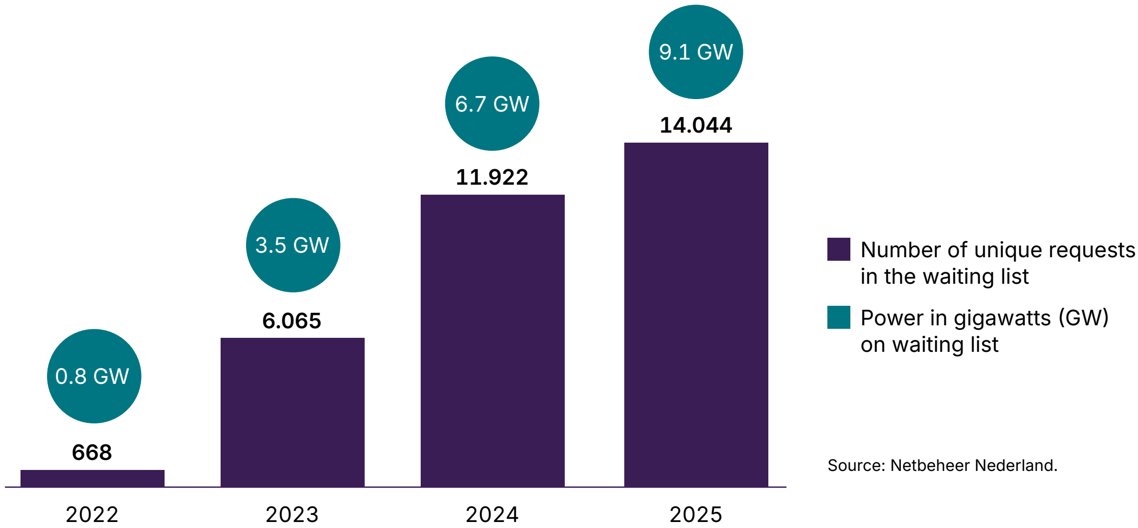
businesses and organisations waiting for electricity connections

The energy transition therefore requires not only more renewable generation, but an energy system that simultaneously invests in infrastructure, flexibility, savings and security of supply.[80] This kind of system approach is also the norm internationally. Germany, for example, in addition to large investments in solar and wind, is also deploying new gas-fired power stations to accommodate fluctuations in supply.[81] These choices do not conflict with climate ambitions, but help keep the transition feasible and affordable, because this simply takes time. The Netherlands must remain committed to the long-term climate goals, while recognising that in the short term, a limited increase in CO_2 emissions may be unavoidable to relieve the power grid and keep the system stable. To manage that smoothly, we need to cap prices as much as possible, create flexibility, innovate with renewable energy sources and prevent strategically essential energy-intensive industries - such as chemicals - from leaving. The goal of the energy transition is to transform our industry, not phase it out. Only with a realistic and robust energy strategy can the Netherlands remain both climate responsible and economically competitive.

Grid congestion is strangling the economy

The shift to renewable energy sources on the supply side and increasing electrification on the demand side requires major adjustments in, and expansion of, our electricity infrastructure. This transition has caused major tightness on the power grid: grid congestion. As shown in Figure 3.10, this has developed into a true national crisis in recent years: while in 2022 there were fewer than 700 businesses and organisations on the waiting list to be connected to the power grid, this number has, in three years' time, exploded to around 14,000. The waiting time for a connection can take many years. For large projects that need to be connected to the high-voltage grid, it can even take as long as eight to 12 years. And that waiting list is still growing fast.[82]

Figure 3.10 Development in the number of bulk users and total power on waiting lists for the off-take of medium and low voltage



Source: Netbeheer Nederland.

Grid congestion slows down both upscaling and sustainability: in the regional industry, almost three quarters of the sustainability plans cannot go ahead in time because the energy infrastructure is not in place.

Businesses on the waiting list are often new, innovative companies that can help the Netherlands move forward in its societal transitions. But existing businesses that already have a connection also have to wait to expand or electrify their business. Meat substitute producer Vivera, for example, cannot expand due to grid congestion,[83] and Cloetta's planned sustainable factory in Roosendaal also did not come to fruition because of the oversubscribed power grid.[84] And as Figure 3.11 shows, this is not just a regional problem: virtually the whole of the Netherlands is struggling with long waiting times for electricity connections. Grid congestion thus slows down both upscaling and sustainability: in the regional industry, almost three quarters of the sustainability plans cannot go ahead in time because the energy infrastructure is not in place.[85] The total costs of this are enormous. It is estimated that €10 billion to €35 billion a year in turnover is already being missed out on, and this is only expected to increase.[86]

This crisis needs to be resolved as soon as possible. The waiting list must be reduced in the short term, the costs for businesses and citizens must be capped, and the grid must be equipped to support the sustainability of the Dutch economy. The existing grid must be optimally utilised to do this, current power generation must be used pragmatically, and the expansion of grid capacity must be dramatically accelerated.

This expansion is progressing too slowly at the moment due to a lack of spatial planning direction for electricity infrastructure.[80] Regional coordination on suitable sites for energy projects can take up to 10 years, and licensing procedures take up to two years. Since the benefits of an efficient electricity system are shared throughout the Netherlands, but the burden of reinforcements falls on a specific region or municipality, this cannot be left to local authorities, which often have conflicting interests. Efficient electricity infrastructure is of national importance: there can no longer be a wait-and-see land-use policy. The Dutch economy needs more robust electricity infrastructure as soon as possible.

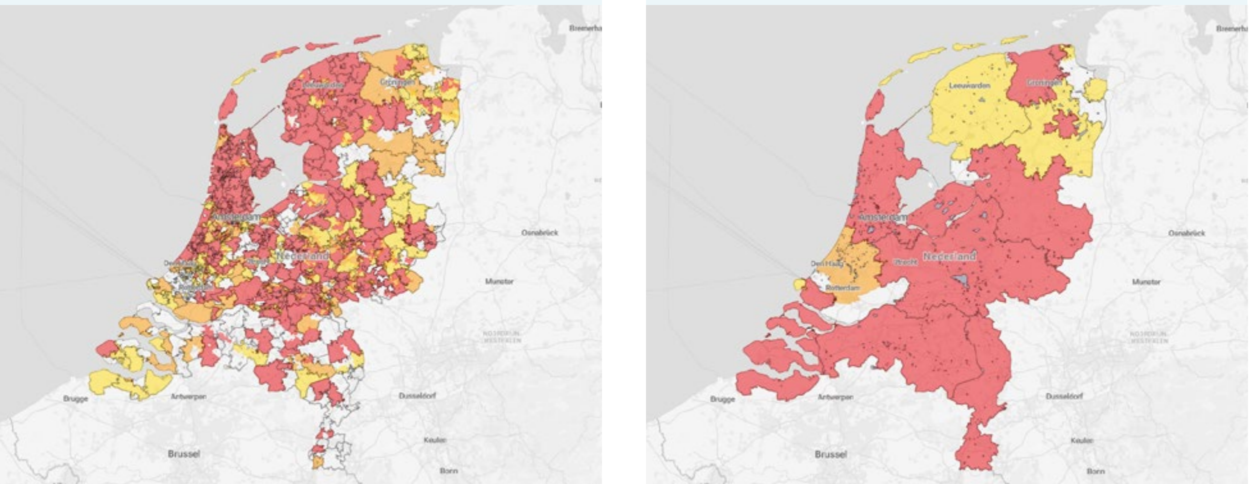
Making our electricity supply more sustainable should also not become an obstacle to the electrification and hence the sustainability of industry. To achieve that, the potential of our current gas-fired power stations must be handled pragmatically. Because they can scale up and down quickly, they can accommodate peaks in electricity consumption on days when the wind does not blow and the sun does not shine. But gas-fired power stations left to the vagaries of the electricity market are closing because they are no longer profitable.[87] Gas-fired power stations at strategic locations must therefore be given medium-term future prospects until battery technology is advanced enough to handle peak loads. A capacity market in which market operators are paid via a capacity auction to keep capacity available offers a solution here. This kind of market already exists in almost all of Europe, but not yet in the Netherlands. In time, capacity can switch to renewable sources when it is cheaper to supply via batteries. Gas hybrid solutions, for example gas hybrid heat pumps, can also alleviate grid congestion in the short term without losing sight of the climate goals. The energy transition must be tackled pragmatically, not dogmatically, and that means making the best use of the resources we have.

Figure 3.11 Development in the number of bulk users and total power on waiting lists for the off-take of medium and low voltage

Grid congestion on the low, medium and high voltage grid in 2025

Availability of medium-voltage and low-voltage transmission capacity (distribution) Regional grid operators, 2025

Availability of high-voltage transmission capacity (transmission) Tennet, 2025



Limited availability without waiting list | Being investigated with | Shortage with waiting list

Source: Netbeheer Nederland (Capacity map); accessed 17 November 2025

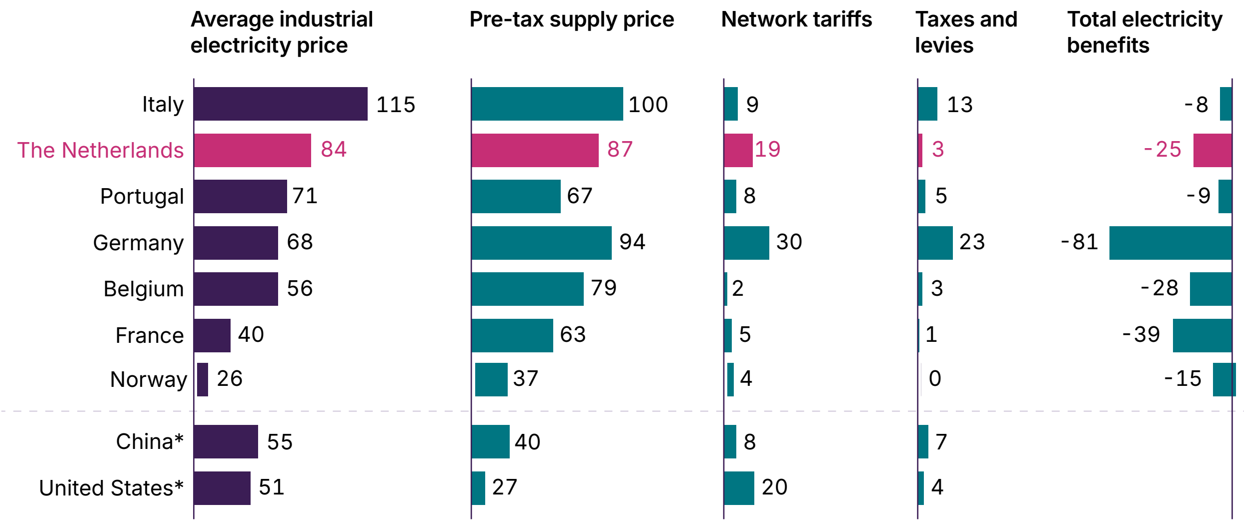
That pragmatism must also be applied to the current grid capacity. Dutch stability requirements for the power grid are extremely high compared to neighbouring countries. As a result, our grids are on average only 30% in use.[88] Lowering the stability requirements somewhat could immediately free up space for new businesses without seriously compromising the stability of the grid. In addition, too little use is made of conservation and flexibility; by encouraging electricity use outside peak times, the grid can be used more optimally. In Zeeland, for example, grid operator Tennet reached an agreement with bulk user Air Liquide to spread their electricity consumption more efficiently throughout the day, which in one fell swoop reduced the waiting list for power connections in Zeeland by 87%.[89] This allows companies like Yara, which invest in CO_2 storage, to continue to grow sustainably. More businesses must be enticed with lower grid tariffs to spread their energy consumption and free up capacity. The pressure on the waiting list must be eased as soon as possible, and this requires creativity in the short term.

Electricity costs make the Netherlands unattractive

When Mario Draghi published his report in 2024, average electricity prices, excluding subsidies, were 158% higher in Europe than the average prices in China and the US. The prices in Europe have since fallen following the shock of Russia's invasion of Ukraine, but are still structurally higher. As shown in Figure 3.12, electricity costs in the Netherlands are even 20-50% higher than in neighbouring countries.

Figure 3.12 The average industrial electricity price for several countries, broken down by supply price, network tariffs, taxes and benefits

In euro (€) per megawatt hour (MWh)



* Average electricity price in the cheapest state/province, excluding benefits.

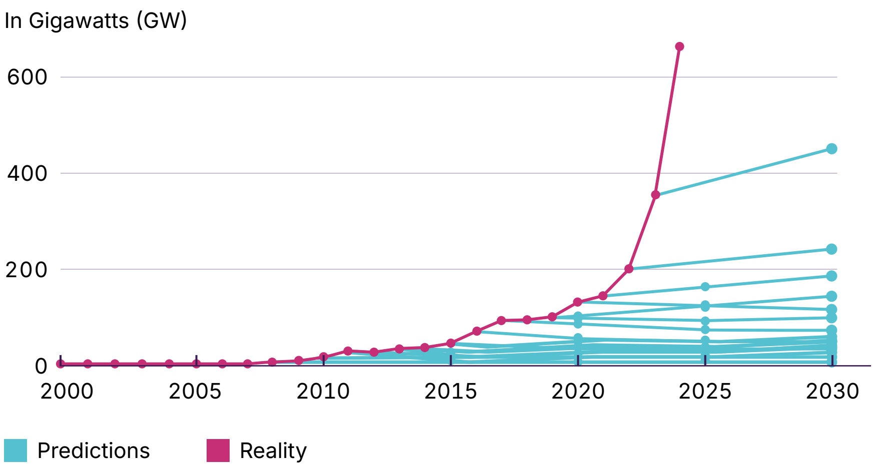
Source: Eurostat; E-bridge; NordPool; Ember; EEA; Norwegian Tax Administration; EFTA Surveillance Authority; ACER (European Union Agency for the Cooperation of Energy Regulators); Statnett; Ståle Skrede; Vattenfall; ARERA; Blue Energy Group; Terna; Sorgenia; expert interviews; APGICEE; AEGE; Barómetro Energético and España – AEGE; RVO.

50%

The electricity price for industry is up to 50% higher in the Netherlands compared to neighbouring countries

Differences in electricity prices are caused by differences in generation and storage costs, grid tariffs, taxes, tax rebates and subsidies. In terms of generation costs, the Netherlands has an unfavourable starting position. Norway's rivers and valleys provide abundant hydropower, but the Netherlands lacks the variations in elevation for this. Solar energy also has relatively limited potential in the Netherlands due to our climate and the large space requirements for solar panels - the latter also applies for the potential of onshore wind farms. The main scalable option for industrial purposes in the Netherlands therefore consists of wind farms in the North Sea, which is a relatively expensive source of renewable energy. Nuclear energy, for example in the form of small modular reactors (SMRs), could also play a role in the longer term, but is not expected to be able to reduce costs in the Netherlands for the next few years.[90] Gas-fired power stations will still have a role to play in the energy system in the coming years because, unlike renewable sources, their capacity can be scaled up and down quickly. Presumably, however, even the additional deployment of gas-fired power stations will not structurally bring down the electricity price.[91] Countries with relatively large numbers of onshore wind turbines, solar hours and solar panels, and existing nuclear or hydropower plants will therefore have lower electricity generation costs in the medium term. The Netherlands therefore desperately needs innovation. What we lack in geographical advantages, we must create through knowledge and ingenuity. And we can. Twenty years ago, solar power at scale seemed an unrealistic dream. However, through continuous innovation, this energy source has exponentially exceeded every prediction in terms of price and capacity, as shown in Figure 3.13. That is why we must continue to offer prospects for the resources that are currently available, such as offshore wind and natural gas, while continuing to deploy new, promising technologies such as nuclear fusion, hydrogen and SMRs in parallel.

Figure 3.13 Growth in solar capacity compared to forecasts[92]
In Gigawatts (GW)



Source: IEA; Energy Institute; Bloomberg NEF / The Economist (2024). Sun Machines.

Besides generation costs, grid tariffs are also relatively high in the Netherlands, due to the enormous investments needed in the electricity infrastructure. Grid tariffs will therefore continue to rise in the coming years, by an expected 5% per year. This will more than double the grid tariffs by 2040.[93] These costs must be kept down as much as possible: the same actions that reduce grid congestion can also yield up to tens of billions in cost savings. Costs must also be spread over time as much as possible so that businesses and citizens can bear this increase.

Our electricity prices must at least be competitive with Belgium and Germany

One area in which the government can play a direct role in the short term is in taxes and tax rebates. Reducing electricity taxes to the European minimum rate, in line with the plans of Draghi and the European Commission,[94] could provide immediate relief to industry and encourage sustainability. Although taxes on electricity are not a large percentage of the total electricity price, all stops need to be pulled out. National taxes on top of EU tariffs, such as a national carbon tax as well, create an unfair playing field within Europe. Low electricity prices are simply of national importance. We need to ensure that our electricity prices are at least competitive with Belgium and Germany.

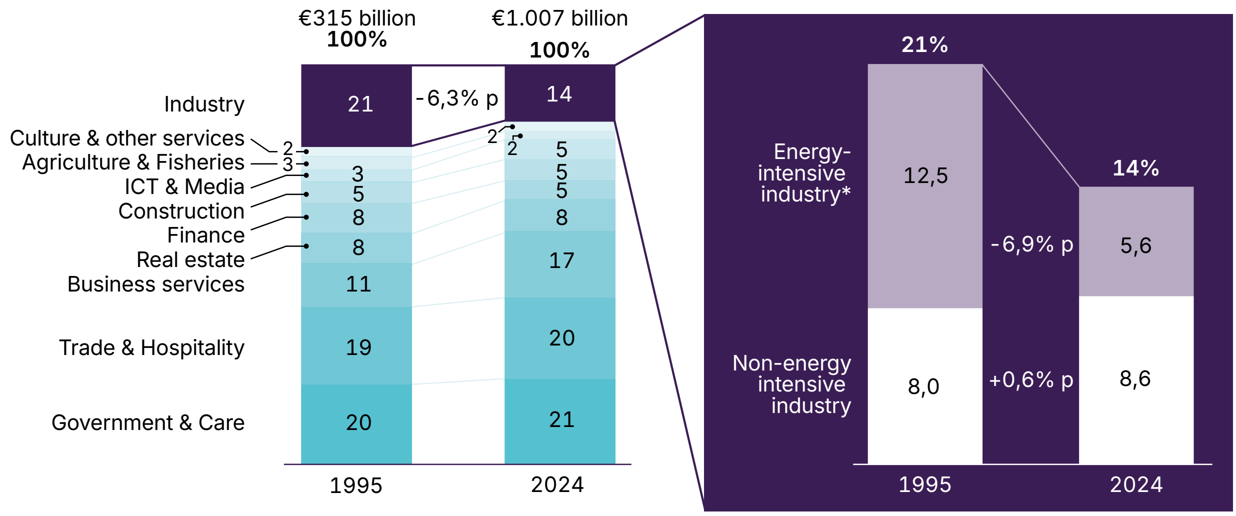
Keep strategic energy-intensive industry in the Netherlands

These prices are crucial for the competitiveness of our energy-intensive industry. As can be seen in Figure 3.14, the share of energy-intensive subsectors in our economy has declined sharply. For a long time, this industry was globally competitive in energy due to the gas extraction in Groningen. Now that the Netherlands has to import gas, and is no longer able and willing to do so from Russia, costs have risen sharply. Not everything is possible in the Netherlands anymore.

This is because the energy-intensive industry makes heavy demands on grid capacity, fresh water, environmental space and land with a high environmental category (where heavier environmental impact is allowed). As energy prices in the Netherlands have limited scope to fall in the short term, some of this industry will not be able to compete in the Netherlands. The departure of such companies is therefore inevitable in some cases and not necessarily negative: it can also have positive side effects. As described in Chapter 1, improved business dynamics can reallocate scarce labour and grid capacity, which is better for the economy as a whole. Moreover, for certain subsectors within the energy-intensive industry, such as the paper and wood industries, dependencies are risky to only a limited degree, as a result of which the strategic implications remain limited. But in part of the energy-intensive industry, these dynamics do not outweigh the negative effects. For example, refining, steel and chemicals underpin several chains of high-value industry in the Netherlands, and dependencies in these sectors are risky for our energy supply and armed forces. Bulletproof fibres for armoured vehicles and equipment for Dutch soldiers, for example, are produced in the Dutch chemicals sector. But electron chemicals and ultra-clean polymers, which are needed for high-end research and production, also have local supply chains.[95] Becoming dependent on alternative suppliers in China in these areas is extremely risky.

Figure 3.14 Development in gross added value by industrial sub-sector in the Netherlands

Between 1995 and 2024, as a percentage (%)



* Included in energy-intensive industries are the following sub-sectors: chemicals, minerals, wood & paper, metal, mining and food.

Source: Eurostat.

Refining, steel and chemicals underpin several chains of high-value industry in the Netherlands, and dependencies in these sectors are risky for our energy supply and armed forces.

And that dependency threatens to reach critical proportions. China is investing heavily in market dominance in the chemicals sector: China is building as much cracker capacity in the coming years as there is today in the whole of Europe.[96] And although the Netherlands still has the fourth largest chemicals industry in Europe today, our production has fallen by more than 20% over the past three years, as shown in Figure 3.15.

Sharp choices are needed to preserve chemicals and other vital sectors in the Netherlands and Europe. Subsidising everything all the time is not possible: concrete, competitive prospects must be created. The focus here must be on strategically vital sectors where dependencies are too risky economically and strategically. Strategically crucial sectors must be kept competitive with European coordination of demand, protection against Chinese dumping, extension and strengthening of the Carbon Border Adjustment Mechanism (CBAM), and coordinating support in sustainability.[97] Such coordinating support is important to enable long-term investments in the Netherlands. Industry and energy suppliers now too often run into a chicken-and-egg problem when planning investments: because industry is unsure of the energy source and the energy supplier is unsure of consumers, we do not innovate enough when it comes to blue and green hydrogen. This also risks delaying the further development of wind farms in the North Sea. Instruments such as contracts-for-difference, two-way

>20%

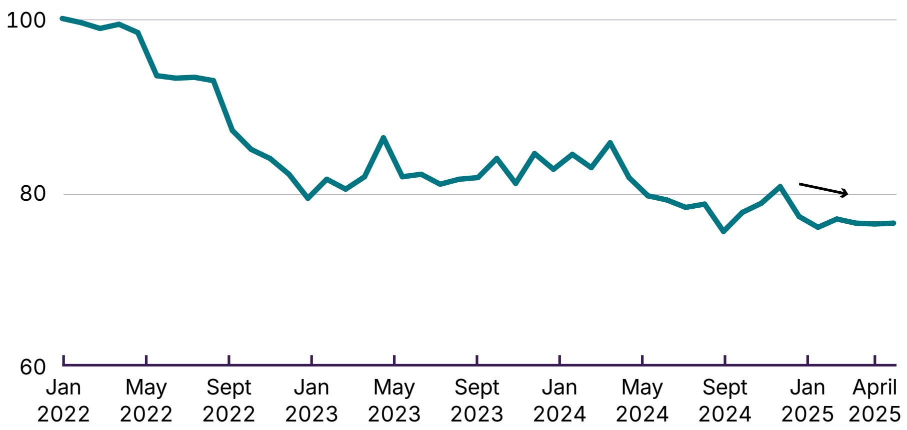
The decline in production in Dutch chemicals over the past 4 years.

contracts that reduce uncertainties, are already used in several European countries such as Belgium and the UK to provide future certainty in the sustainability of our industry and electricity mix.[98] So to keep our industry competitive while encouraging it to become more sustainable, the government must take a facilitating role in which certainty is provided for both industry and energy suppliers.[80]

Where an industry no longer has future prospects and dependencies are not strategically risky due to a diversified global market, broad European competence, or limited need in crisis situations, it must also be accepted that some of these companies may no longer be able to compete in the Netherlands. Given the severe shortages in the Netherlands, capacity on the power grid and technically skilled talent will be able to be deployed elsewhere. Competition remains key in strategically relevant sectors as well: zombie companies must not be kept alive. This requires smart policy which both maintains healthy dynamics and prevents strategic industry leaking away. Clear choices and direction are not easy, but they are necessary.

Figure 3.15 Development in the monthly production level in the chemicals industry in the Netherlands

From January 2022 (= index) to April 2025*



* Seasonally and calendar-adjusted production, 2-month moving average.

Source: CBS.

Conclusion and recommendations

The Netherlands' energy supply needs to be put in order as soon as possible. The acute grid congestion is preventing new, innovative businesses from getting electricity connections. As a result, innovative companies that will shape tomorrow's economy cannot develop in the Netherlands. The high prices also make it impossible for existing high-productivity businesses in the Netherlands to compete on the global market.

1. Solve the grid congestion crisis

- Strengthen national control on land: have the central government manage the construction of energy infrastructure in the most efficient places. Speed up site allocation, land acquisition, and licensing to the bare minimum time required and cap the periods for objection and appeal.
- Make flexible grid use among bulk users the norm by removing financial and regulatory barriers. Subsidise, whereby the costs for the business and benefits for the wider economy are not evenly split. Create financial incentives for flexible grid use among small users as well, for example in electric car charging.
- Reduce grid stability requirements to create more space within existing capacity.
- Use our existing gas capacity pragmatically as a transition technology: give strategically located plants clear prospects for the future to handle peak loads and relieve the grid.

2. Lower energy prices in the short and long term

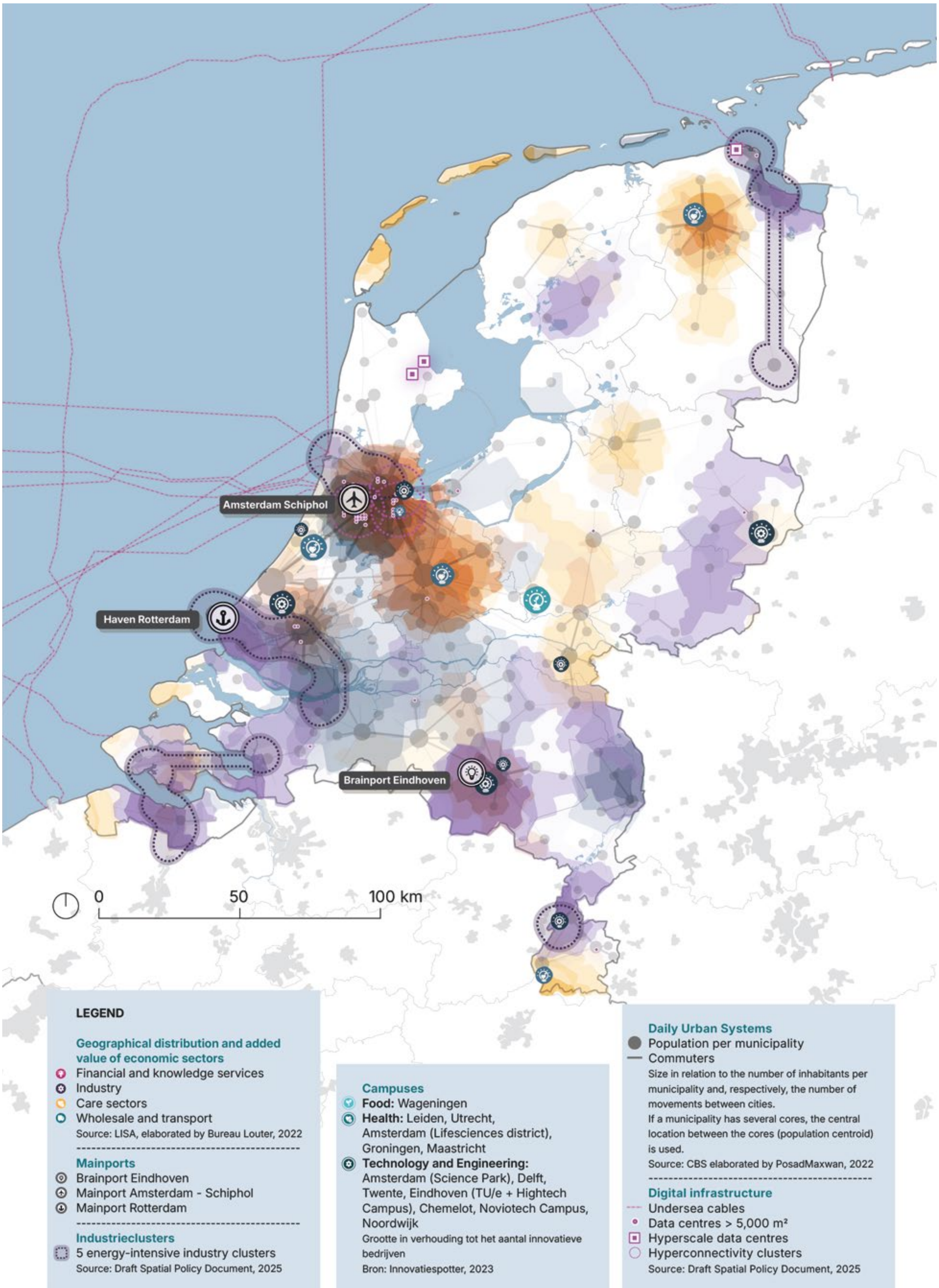
- In the short term, reduce the energy tax on electricity for industrial bulk users to the European minimum rate, in line with the plans of Draghi and the European Commission
- Cap rising network tariffs by implementing congestion measures as soon as possible. Actively encourage energy innovation; from research to demonstration and large-scale implementation. Do this both for decentralised solutions, and for system technologies, including small modular reactors and hydrogen electrolysis. The government must act here as a launching customer to accelerate breakthroughs and generate investment.
- Make sure the energy price in the Netherlands is at most at the same level as in Germany and Belgium. Do not tax Dutch companies more heavily than competitors in neighbouring countries, for example through a national carbon tax.

3. Create chain-wide prospects for the future in industry and energy

- Develop a National Energy Plan that, together with industry, makes clear choices on the future energy mix, the infrastructure needed, energy innovation and regulatory adjustments required to achieve this.
- Use innovative tools like contracts for difference to provide two-way security at limited cost.

4. Retain strategically relevant energy-intensive industry

- Specifically identify the sectors that must be retained within the Netherlands and Europe to avoid risky strategic dependencies.
- Offer these sectors concrete prospects for the future, through a combination of European coordination of demand, protection against Chinese *dumping*, and coordinating support in sustainability. Gradually expand the European CBAM mechanism so that products imported from outside the EU have similar carbon costs.


Amsterdam Schiphol
Haven Rotterdam
Brainport Eindhoven
0
50
100 km
LEGEND
Geographical distribution and added value of economic sectors
Financial and knowledge services
Industry
Care sectors
Wholesale and transport
Source: LISA, elaborated by Bureau Louter, 2022
Mainports
Brainport Eindhoven
Mainport Amsterdam - Schiphol
Mainport Rotterdam
Industrieclusters
5 energy-intensive industry clusters
Source: Draft Spatial Policy Document, 2025
Campuses
Food: Wageningen
Health: Leiden, Utrecht, Amsterdam (Lifesciences district), Groningen, Maastricht
Technology and Engineering: Amsterdam (Science Park), Delft, Twente, Eindhoven (TU/e + Hightech Campus), Chemelot, Noviotech Campus, Noordwijk
Grootte in verhouding tot het aantal innovatieve bedrijven
Bron: Innovatiespotter, 2023
Daily Urban Systems
Population per municipality
Commuters
Size in relation to the number of inhabitants per municipality and, respectively, the number of movements between cities.
If a municipality has several cores, the central location between the cores (population centroid) is used.
Source: CBS elaborated by PosadMaxwan, 2022
Digital infrastructure
Undersea cables
Data centres > 5,000 m²
Hyperscale data centres
Hyperconnectivity clusters
Source: Draft Spatial Policy Document, 2025

324.5 billion

In Dutch products exported in 2023

3.4. Strengthen the economic infrastructure

The Dutch economy has enormous diversity. As the map on the previous page shows, there is tremendous activity and innovation across the country, making for a strong, resilient economy that can compete at the top international level. This activity is fuelled by our mainports and innovation ecosystems. In these places, scientific knowledge and industrial competences come together to create vibrant ecosystems. The technology and innovation created there benefits the whole of the Netherlands. Wageningen University, for example, produces innovations that make agriculture throughout the country competitive. And as shown in Figure 3.16, Brainport Eindhoven has suppliers from Limburg to Friesland. This economic infrastructure is founded on our digital infrastructure. Undersea cables, fibre optics, data centres, communication networks, cloud access and supercomputers form the backbone of our scientific and industrial ecosystems. We must not neglect these ecosystems. Besides their economic function, they also make a critical contribution to the resilience of Dutch society. They are crucial for our economic, technological and societal ambitions.

Transform the mainports as engines of our economy

For centuries, we have made a large part of our money via our connection with foreign countries: in 2023, we exported €324.5 billion in domestic products, and 35.2% of our total income is earned from international trade.[99] This makes us one of the most open economies in the world. The two most important hubs in our trade economy are the two traditional mainports: Schiphol and the Port of Rotterdam. The excellent accessibility and surrounding business activities of these mainports make them a holistic economic ecosystem. A wide range of activities benefit from the opportunities they create.

Figure 3.16 Regional high-tech OEMs and their suppliers

Supplier dots can represent multiple businesses

Rotterdam is well placed to be the home of tomorrow's green industry.

For US company Eli Lilly, for example, its proximity to Schiphol Airport and the port was a major reason for deciding last month to build a €2.6 billion factory in Katwijk.[100] These two crucial international pivotal points are under increasing pressure, however.

The port of Rotterdam is facing a major transformation. Europe's largest port generates tens of billions in added value and is an indispensable hub for Dutch trade, which is concentrated around its waterways. But beyond the trade in products, the port still runs largely on fossil fuel transhipment.[101] As the energy transition progresses, the port - and the industry cluster - will change fundamentally. That transition comes with great uncertainties. Grid congestion is strangling electrification and nitrogen constraints are delaying or preventing new projects. Investments in capturing and storing carbon in old gas fields and developing green hydrogen have long uncertain payback periods that too often depend on fickle policies. Rotterdam is well placed to be the home of tomorrow's green industry, but to do so it needs to be given the right prospects for the future. From that perspective, further seaward expansion is important to create space for the transition. Strengthening the connection with the hinterland also plays a role in this, such as via the Delta Rhine Corridor towards Germany, to coordinate and connect new green industry flows Europe-wide.[102]

The port of Rotterdam is not the Netherlands' only major exporter, however. We exported €268 billion in services in 2023, mainly from the financial and business ecosystems in Amsterdam and Utrecht.[103] Schiphol is the main hub of this internationally-oriented service sector, and international headquarters set up offices due to the good connectivity around the airport. Valuable goods such as medical isotopes and chip machines are also transported through Schiphol, making the airport indispensable for our innovative ecosystems. This makes Schiphol attractive to people and businesses because of its hub function: it is the best connected airport in the euro area.[104] The large number of direct flights, to destinations in Europe and beyond, saves time and money on transfers. Partly for this reason, international headquarters like to settle in proximity to the airport. These Dutch and foreign multinationals make up almost one-third of our GDP and over three-quarters of Dutch exports.[105] Schiphol is extremely important in retaining this activity and attracting new investment to the Netherlands.

But the airport is under great pressure from society. Although almost 80% of the Dutch people are positive about aviation,[106] there are major concerns about environmental pollution and noise pollution. The airport's mandate thus depends on a successful transition to quiet, energy-efficient aviation. Levies on environmental damage, such as the flight tax, must be used to further encourage this transition, for example via Sustainable Aviation Fuel (SAF). This will enable the airport to become competitively sustainable. Instruments to make SAF more affordable, such as double-sided auctions, ought to be explored to accelerate the transition of aviation.[107] If the airport is to shrink further, Schiphol will lose its position as an international hub, and the Netherlands will lose its appeal for the international business activity that we rely on as a small, open economy.[108]

“If you look at history, innovation doesn't come just from giving people incentives; it comes from creating environments where their ideas can connect."”

– Steve Jobs, co-founder and former CEO of Apple

As an innovation ecosystem, Brainport Eindhoven is closely linked to other ecosystems, such as the Noviotech campus in Nijmegen, TU Delft Campus, and its businesses collaborate throughout the country on innovative projects, such as the Einstein Telescope in Zuid-Limburg.

Brainport Eindhoven is not a traditional logistics mainport like Schiphol and the Port of Rotterdam are. However, due to its high-tech industrial profile, Brainport, like Rotterdam and Schiphol, does have a tremendously broad positive impact on the economy.[109] The region's high-tech industry has been growing faster than the Dutch economy for decades, and direct product suppliers can be found in every Dutch province.[111] Because of this rapid growth, the region is coming up against limits: lack of space, mobility infrastructure and electricity put a brake on the region's growth ambitions.[112,113] But in Brainport, it is also easy to see how public-private partnerships can solve these problems. With Project Beethoven - a €2.5 billion investment programme in talent, mobility and housing - central and regional governments working with the business community have offered prospects for long-term growth.[114] As links in the Dutch economy, our mainports need these kinds of prospects for the future in order to flourish, and the Dutch economy with them.

Promote the innovation ecosystems as a source of progress and growth

As an innovation ecosystem, Brainport Eindhoven is closely linked to other ecosystems, such as the Noviotech campus in Nijmegen, TU Delft Campus, and its businesses collaborate throughout the country on innovative projects, such as the Einstein Telescope in Zuid-Limburg. The Netherlands has a great diversity of innovation ecosystems like this, connected with each other via all kinds of networks.[115] Of these, campuses are the focal points where research and industrialisation converge.[116] Wageningen University and its campus are world-class in agriculture and nutrition,[117] the Biotech Campus in Delft is one of Europe's leading white biotechnology ecosystems, and the Centre for Mathematics and Computer Science at the Amsterdam Science Park is internationally known as the place where the Python programming language was invented. There is also a lot of innovative business activity focused on biotechnology around the university medical centres such as Leiden Bio Science Park and Utrecht Science Park.[118] Moreover, these ecosystems can flourish even more when they are better connected to nearby European knowledge regions, such as Leuven and Dresden, where there are complementary strengths in semiconductors, AI and biotechnology that can directly strengthen Dutch innovation chains.

Each of these ecosystems is unique and has its own competences and challenges. But all of them need strong physical infrastructure, access to knowledge and research, and local industrial networks to flourish.[119] Given the growing geopolitical threat, attention must also be devoted to the resilience of these ecosystems. Of the 5% NATO commitment agreed, 3.5% is spent directly on defence, but 1.5% is earmarked for security-related spending. To secure the industry and innovation on which the Dutch armed forces rely, these resources must be used to, among other things, stimulate and increase the resilience of the Dutch mainports and innovation ecosystems.

To remain competitive, the businesses that make up these ecosystems need stable policy with competitive preconditions. Instruments such as the Research and Development (Promotion) Act (WBSO) and the Innovation Box, for example, make investments in R&D fiscally attractive and thus promote innovation throughout the country.[120] But to create businesses that can make use of these instruments, the innovation paradox from Chapter 2 must be broken out of: The Netherlands creates too few academic spin-offs because our ecosystems are often too weak and scientists are not encouraged to be entrepreneurs. Universities are often reluctant to transfer control of intellectual property and do not cooperate enough with investors and companies that can contribute industrial knowledge. This situation manifests itself in low experimental R&D spending, on which the Netherlands scores dreadfully low internationally. Public-private partnerships in innovation are now the exception rather than the norm in the Netherlands.

The Netherlands must aim for the highest number of academic spin-offs per million inhabitants in Europe.

Nevertheless, our ambition must be high: The Netherlands must aim for the highest number of academic spin-offs per million inhabitants in Europe. This calls for structural co-financing for spin-off creation, targeting universities with the greatest potential for commercialisation. This must go hand in hand with clear, entrepreneurship-friendly preconditions: radical simplification of negotiations on intellectual property, clear performance agreements, and early involvement of venture capital investors. In order to standardise and professionalise the support and monitoring of academic entrepreneurs, the technology transfer offices (TTOs) of universities must join forces into a single national TTO that is responsible for developing and rolling out best practices. In this way, the Netherlands can not only lead scientifically but also convert its knowledge into economic strength and technological relevance.

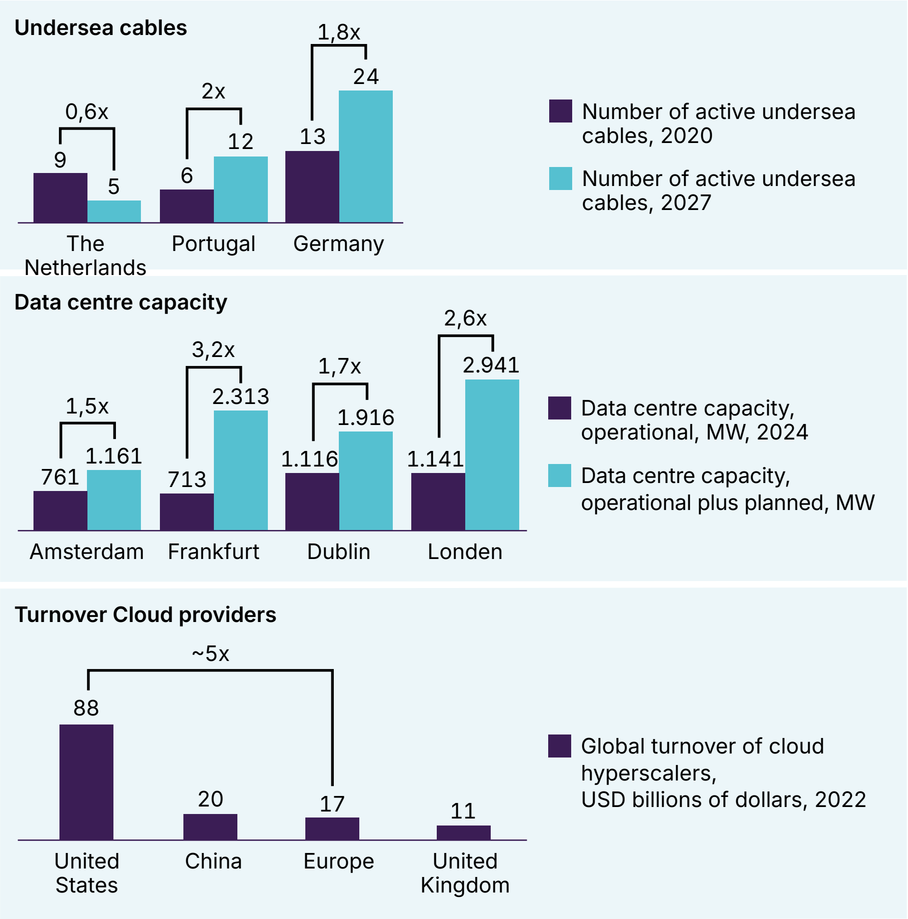
Our innovation ecosystems also need the right facilities to carry out this research. For example, semiconductor research cannot be done without cleanrooms. However, this research infrastructure now lags behind most European countries. We are in the bottom five countries in investment in supercomputers, which makes biomedical research on molecular structures difficult. Additional investments will be needed to bring our infrastructure up to scratch for these technologies of the future. This requires a widely supported strategy to deploy national resources effectively and to properly align these with European initiatives. To generate the innovation the Netherlands needs for a strong technological position and healthy economic growth, world-class innovation ecosystems are a requirement, in which top-level science and public-private partnerships contribute to the valorisation of research into world-class businesses.

Strengthen the digital backbone of the economy

Besides the specific facilities that innovation ecosystems in different sectors need, there is one that affects them all: digital infrastructure. If they are to thrive, research and the economy need not only a solid physical infrastructure, but also a solid digital backbone. Telecom networks, undersea cables, data centres, hosting, internet exchanges and cloud access are all indispensable links in this ecosystem. But in the Netherlands, this chain is in danger of falling apart.

We are traditionally a digital country. In 1988, the Netherlands became the second country in the world to connect to the NSFNET, the precursor of the internet. In the decades that followed, Amsterdam and AMS-IX grew to become one of Europe's most important internet hubs. Amsterdam is one of the key tech locations in Europe, and one of the five locations offering hyperconnectivity (alongside Frankfurt, London, Paris and Dublin, known as FLAP-D). However, the Netherlands' position as one of Europe's digital hubs is under severe pressure. Amsterdam has fallen from second place to fifth place in the ranking of best

Figure 3.17 Depiction of the declining quality and quantity of the Dutch digital infrastructure



Source: Dutch Subsea Cable Coalition, ING, Statista.

Without sufficient data centre capacity and undersea cables, international data flows will gradually move to other digital hubs.

connected cities in recent years.[121] This decline manifests itself mainly in the state of our undersea cables and our data infrastructure. Of the nine undersea cables now running to the Netherlands, half are at the end of their technical life, and new landfall sites are being established mainly in other European countries. This threatens the control of our data traffic and our potential as a hub: two new intercontinental undersea cables are needed just to meet the expected data demand between the Netherlands and the US. Whereas these are publicly-privately funded in other countries, the Dutch government does not invest in these undersea cables.[122]

Dutch data storage and processing capacity is also coming up against limitations.[123] In the Netherlands, hyperscale data centres may only be built in 2 of our 342 municipalities, and regular data centre capacity is also growing slowly compared to other European countries.[124] This manifests in increasing shortages: over the past five years, the free available capacity space in data centres in the Amsterdam metropolitan region has fallen from 24% to 9%. The municipality of Amsterdam also recently announced that data centres will not be eligible for planning permission again until 2035, mainly due to acute grid congestion.[125] Large Dutch companies and research institutions will therefore increasingly have to outsource their IT capacity to data centres outside the Netherlands.

Without sufficient data centre capacity and undersea cables, international data flows will gradually move to other digital hubs. This is not just about the infrastructure itself: the knowledge ecosystem which surrounds such a hub will gradually erode as well. This particularly affects the financial sector, science and knowledge institutions, but also large international tech companies like Booking.com and Adyen. Without room for further data centre growth, the Netherlands risks losing technical expertise and jobs. This puts pressure on the further development of our strong and relevant positions in fintech, cloud and AI.[126] Since our strategic dependence on digital infrastructure is already enormous, we cannot afford this. The Netherlands needs to continue investing in digital infrastructure from undersea cables to data centres and fibre optics to keep the digital backbone of the economy vital.

Conclusion and recommendations

The Dutch economy is supported by a number of pillars. Our international competitiveness stems from our innovation ecosystems and is made possible by the mainports. These areas are thus of disproportionate economic importance: their chain effects reverberate throughout the Netherlands. Our digital infrastructure is also an important mainstay of the economy, but it is waning. Without future prospects and growth opportunities for these crucial economic pillars, the growth of the whole country will lag behind.

1. Create a national plan to strengthen innovation ecosystems

- Provide structural funding for knowledge infrastructure within the key ecosystems, such as cleanrooms, computing capacity and campuses to boost innovation. To this end, work together with knowledge institutions, industry and the region to develop a national plan that safeguards the development, resilience, coherence and utilisation of this infrastructure. Use the 1.5% space within the 5% NATO commitment for this.
- Offer structural co-financing for academic spin-off creation, coupled with entrepreneurship-friendly preconditions. Join the forces of the TTOs into one national TTO.
- Do not make Project Beethoven a one-off project, but have public and private parties work together structurally to solve bottlenecks in growth and innovation in these ecosystems.

2. Offer the mainports long-term future prospects

- Link aviation tax to funds for sustainability and modernisation, so that Schiphol can lead the way in sustainability and the money flows back into the Dutch economy.
- Support the further development and sustainability of the Port of Rotterdam by providing space and enabling further seaward expansion.

3. Strengthen the Dutch digital infrastructure

- Organise and fund public-private partnerships to invest in intercontinental and intra-European undersea cables in the short term.
- Prioritise space and energy supply for (co-location) data centres. Work with municipalities to use space and grid capacity smartly, but provide central control over the capacity needed.

“If a car has four flat tyres, all four need to be replaced.”

– Peter Wennink

Concluding remarks chapter 3

As this chapter has shown, the Netherlands faces major challenges. Our regulatory framework and its implementation are no longer geared to the societal challenges of our time. Our labour market is becoming less and less future-proof, and our energy infrastructure and prices are increasingly throttling the business sector - especially our industry. Our mainports, innovation ecosystems and digital infrastructure are in danger of crumbling. A great deal of overdue maintenance needs to be done in the Dutch economy.

Without the right preconditions, our economy will stagnate. However, if we have the courage to make the right choices, there is huge potential in the Netherlands. And it can be done: these are not impossible tasks. The Netherlands can break out of the nitrogen deadlock, we can use our talent more effectively, we can allow our innovation ecosystems to flourish. We can build a competitive, green industry in the Netherlands. As the next chapter will show, we have enormous investment potential in our most relevant societal domains. For that, the preconditions described in this chapter all need to be in place. If a car has four flat tyres, all four need to be replaced. Otherwise, these investments, and thus tomorrow's economy, simply cannot move forward.

CHAPTER 4

What is possible if the preconditions are in place: the investment pipeline

This chapter shows not what could be, but what is ready. It is based on 51 propositions from the business sector and public institutions which together form an immediately realisable pipeline to unlock growth opportunities and strategic positions. But these can only be realized once the preconditions are in place. This chapter serves as an illustration of what the Netherlands can already achieve in the short term and what opportunities will be lost if we do not act.

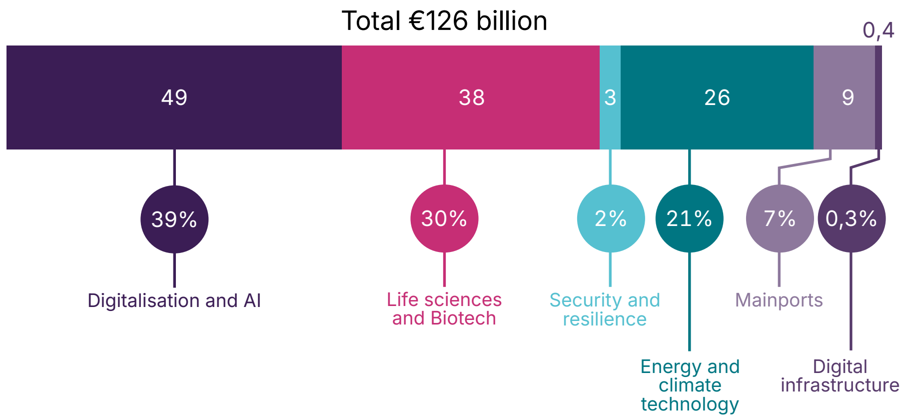
4.1 An investment pipeline that could transform the Netherlands

The Netherlands has an exceptionally strong pipeline of investment plans. Over a thousand experts from the business sector, universities and (semi-)public institutions developed 51 propositions within the four strategic domains from Chapter 2: digitalisation and AI, security and resilience, energy and climate technology, and life sciences and biotechnology. These 51 propositions from more than 30 consortia collectively amount to an investment potential of €126 billion, as shown in Figure 4.1. This amount does not represent a one-off boost, but a multi-year pipeline of public-private investment that grows along with the development of technology, the market and preconditions. 70% the investment value comes from private investors. The underlying figures have been provided by the consortia themselves and therefore provide direct insight into the investment readiness under the current preconditions. The private share is expected to increase further as these preconditions improve. All the individual propositions are detailed in the appendix to this report.

These propositions show what investments are possible to achieve the growth target and investment task (described in Chapter 1) and build strategically relevant niches (described in Chapter 2) in the critical domains (as described in Chapter 3). For these propositions to reach their full potential, the preconditions described earlier (also in Chapter 3) are crucial. The consortia involved have indicated that, as co-funders of these investments, they stand ready to initiate these investments once these preconditions are in place. This pipeline is illustrative, not exhaustive: it shows what is already investment-ready, while the broader potential in these domains is even considerably larger.

Figure 4.1 Project size of the investment proposals submitted

In billions of euro (€)



The projects in this report are spread across the country, in national and regional innovation ecosystems.

The geographical distribution of the proposals (see Figure 4.2) shows that the strength of this pipeline lies not only in its size, but also in its transformational impact. The projects are spread throughout the country and strengthen both regional and national innovation ecosystems. Together, they have the potential to create direct societal value - from affordable and reliable energy to new medical breakthroughs and more secure digital infrastructure. This map highlights that technological advances can take root anywhere in the Netherlands, and how economic opportunities within the four domains of this report span the entire country.

Some of the proposals submitted build on the innovation infrastructure developed via the National Growth Fund (NGF) in recent years. Whereas NGF programmes focused on early development and ecosystem formation, the current propositions focus on the next step: technological scale-up and industrialisation. The proposals span the full breadth of Technology Readiness Levels (TRLs), from proven technology to high-risk, high-reward innovations, and are ready to scale up from lab or pilot to industrial production. As Chapter 2 has shown, this is precisely the phase in which the Netherlands is now missing out on opportunities, and which we must therefore now pursue.

There is also a clear technological connection between the proposals. For instance, semiconductor, AI and photonics projects support innovations in all four domains, from medical imaging to energy-efficient systems. Proposals around advanced materials tie in with both electrolysis technology and diagnostics and precision systems. And new biotechnology production techniques find direct application in medical, industrial and security-relevant innovations. This creates a single technology chain in which projects reinforce each other.

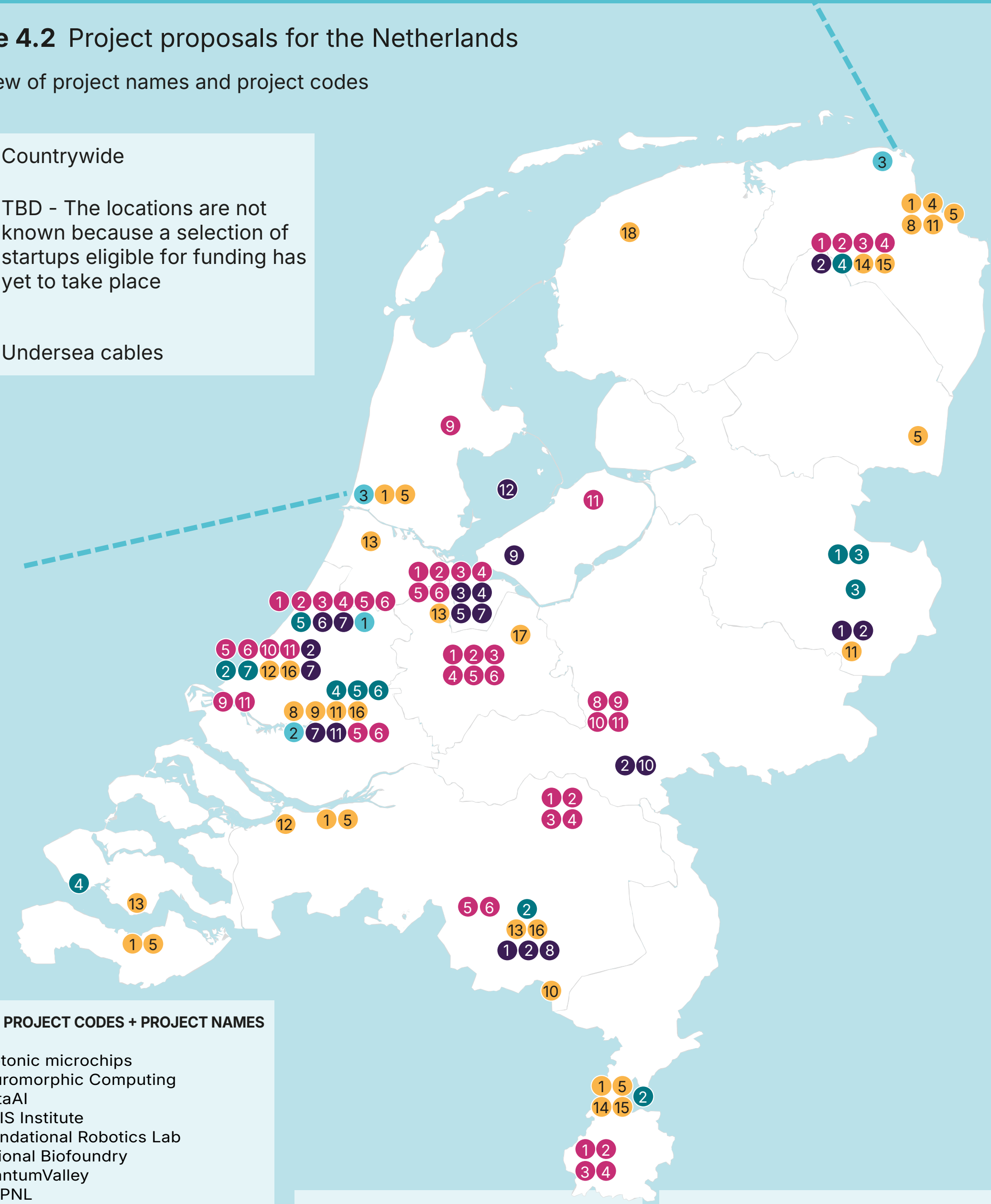
Figure 4.2 Project proposals for the Netherlands

Overview of project names and project codes

7 Countrywide

2 6 3 7 TBD - The locations are not known because a selection of startups eligible for funding has yet to take place

Undersea cables



LEGEND | PROJECT CODES + PROJECT NAMES

D1 Photonic microchips
D2 Neuromorphic Computing
D3 DeltaAI
D4 ELLIS Institute
D5 Foundational Robotics Lab
D6 National Biofoundry
D7 QuantumValley
D8 CHIPNL
D9 Institute for Advanced Materials & Metrology (IAMM)
D10 Robotics Center of Excellence
D11 AI Gigafactory
D12 Dutch Data & Energy Clusters

V1 National satellite capacity & Next-Gen Payloads
V2 National drone capacity & development programme
V3 National Counter UAS capacity & development programme
V4 Werf van de Toekomst [Shipyard of the Future]
V5 Smart Maritime
V6 Robotisation of offshore wind energy
V7 Nuclear marine propulsion

K1 Greening of crackers, gasification, methanol to olefins
K2 Circular plastics
K3 BioBased Circular Economy
K4 Carbontech/Carbon Capture & Utilisation (CCU)
K5 Innovative Chemistry NL
K6 Chemistry for Defence
K7 PFAS substitution
K8 Nobian Battery Chemicals - Lithium Refining
K9 WMC Liminal Lithium
K10 Nyrstar Budel Critical Minerals Project
K11 Nobian Battery Chemicals (salt battery)
K12 Allseas SMRs
K13 Thorizon
K14 BatCelFab
K15 GigaNode
K16 HyValue Chain NL
K17 PFAS removal
K18 WaterVal

L1 Biotech Nexus
L2 Infectious diseases
L3 ATMP (Advanced Therapy Medicinal Products) I&II
L4 Precision Diagnostics Platform
L5 New generation of image-driven therapies
L6 Autonomous MRI systems
L7 A nationwide system of regional command centres
L8 Food2040 Talent and infrastructure
L9 Biotechnology for breeding: crops and animal breeding
L10 Bio and process technology for new ingredients
L11 Robotics and AI in agriculture and horticulture

M1 Aviation
M2 Port of Rotterdam
M3 Intercontinental Submarine Cable Connections

This pipeline ties in closely with the European strategic direction in the European Competitiveness Fund.

Against this backdrop, it also becomes clear why preconditions are decisive for realising this pipeline. Figure 4.3 maps out by domain which conditions structurally determine whether investments can be realised. The colour intensity in this 'heatmap' shows how often a specific precondition is mentioned, and makes it clear that almost all bottlenecks are not incidental or sector-specific but cross-domain.

The investment pipeline also ties in closely with the European strategic direction - as outlined in the European Competitiveness Fund - and with initiatives in Germany, France, the UK, Belgium and the Nordics. As a result, many Dutch proposals offer not only national prospects, but also opportunities to scale up bilaterally or via European programmes (such as 'Important Projects of Common European Interest and Horizon Europe'), share infrastructure or link value chains where strategically and economically advantageous.[127]

Figure 4.3 Heatmap of the preconditions for each domain

Percentage (%) of propositions that identify these preconditions as obstacles

		Digitalisation and AI	Life sciences and biotechnology	Security and resilience	Energy and climate technology	Mainports and digital infrastructure	Total
Laws and regulations	Regulation	67%	100%	86%	67%	33%	75%
	Regulatory burden	17%	55%	43%	22%	0%	29%
	Licences	50%	64%	86%	89%	67%	73%
	Certification	0%	45%	57%	17%	33%	25%
	Nitrogen emission allowances	25%	27%	14%	44%	67%	33%
Infrastructure	Spatial constraints	33%	27%	43%	17%	67%	29%
	Digital infrastructure	67%	82%	86%	0%	33%	47%
	Test capacity	33%	91%	100%	28%	0%	51%
Energy	Grid congestion	75%	45%	14%	33%	33%	43%
	Electricity costs	25%	36%	29%	67%	33%	43%
Talent	(Digital) Talent	83%	100%	71%	50%	0%	69%
	Labour shortage	25%	45%	71%	11%	33%	31%
Other	Financing	83%	100%	71%	94%	67%	88%
	Taxation	8%	73%	29%	0%	33%	24%
	Launching customer	0%	0%	100%	11%	0%	18%
	Other	17%	9%	0%	56%	33%	27%
	Totaal	12	11	7	18	3	51

High ▮▮▮▮▮ Low

This cohesion is the starting point for this chapter. We show how the 51 propositions can become the core of a national investment agenda. In the elaboration for each domain, we address a number of essential aspects in each case: the importance of the domain, the contribution of the propositions to growth and strategic relevance, the preconditions that need to be restored for each domain and the costs of inaction. This demonstrates the opportunities for the Netherlands if the preconditions are realised in time - and the risks we face if we do not act.

4.2. Digitalisation and AI

70%

of worldwide growth over the next 10 years will be digitally driven.

Digitalisation is having a major impact on our economy and society. Virtually all high-tech breakthroughs these days are digitally driven: whether in energy, biotechnology or the high-tech industry. Developments in the digital stack are determining the speed and scale of this innovation across virtually our entire economy. For years, this domain has determined the growth and relevance of economies: as Chapters 1 and 2 describe, the gap in productivity growth between the EU and the US is largely due to the lack of a fully-fledged European digital industry.[128]

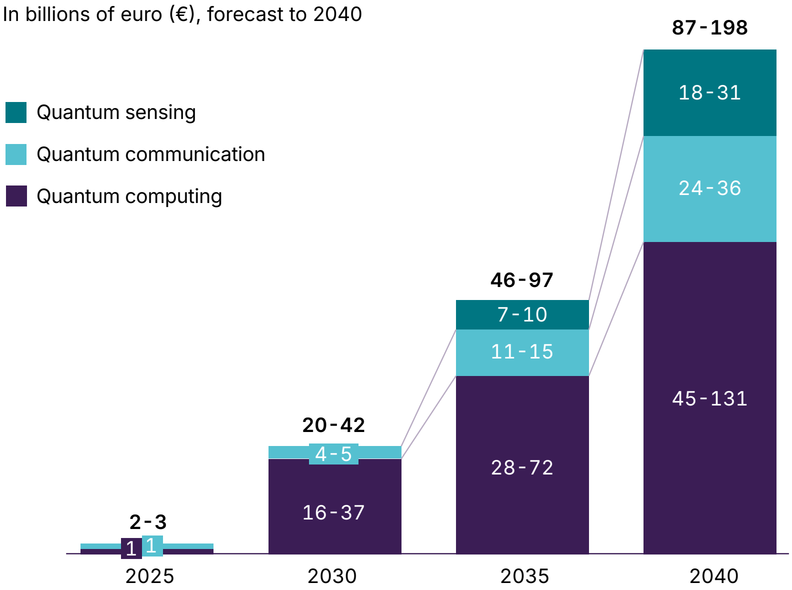
That growth potential is far from exhausted: 70% of worldwide growth over the next decade will be directly or indirectly digitally driven.[129] The global semiconductor industry, an industry that already generates nearly €800 billion in annual turnover worldwide - and already accounts for €30 billion in turnover in the Netherlands - is expected to double in the next five years.[130, 131] New digital technology markets also offer potential for leading Dutch companies. As Chapter 2 has described, we have a good foundation in quantum applications, and the global market potential of this technology is expected to grow by a factor of 30 in the next 10 years, as shown in Figure 4.4.[132] Quantum is not the only growth market: in photonics, where the Netherlands also has a strong starting position, the market is expected to grow by a factor of 10 to 20 in the period to 2035. By effectively converting our knowledge position into production, the Netherlands can build strong positions in these growth markets and thus drive Dutch economic growth.

Besides these growth markets, AI can also make an enormous contribution to Dutch growth potential. Productivity growth in the AI sector is more than four times higher than in the rest of the economy[133] and recent analyses show that the use of AI can increase labour productivity globally by 0.1% to 0.6% per year.[134] This kind of productivity growth would make a huge contribution to the necessary structural growth acceleration that the Netherlands needs in the coming decade. With the acceleration of AI development as well as widespread use in

1 The digital stack are the various layers that make up digital technology; from raw materials to the application of a product. In this report, we use three rough layers as a starting point: hardware (e.g., semiconductors), intelligence (e.g., AI) and software (e.g., applications), with the digital infrastructure as the backbone on which this stack is built.

Figure 4.4 Market size of quantum technology

In billions of euro (€), forecast to 2040



Source: McKinsey Quantum Technology Monitor 2025, McKinsey Digital Technology Monitor 2025.

Digitalisation determines success in every domain mentioned in this report.

businesses,[135] government[136] and healthcare,[137] structural productivity improvements can be realised that are unachievable without AI.

Because of these rapid developments, digitalisation has also increasingly become a geopolitical issue. Digital technology, from semiconductors and cloud infrastructure to data processing and AI models, is critical for production lines, telecommunications, healthcare processes, energy supply and the armed forces. For example, more than two-thirds of businesses report that they would be unable to function within a day in the event of telecom or ICT outages.[138] Access to these digital fundamentals is also increasingly determining the success of the other three strategic domains in this report. Within energy and climate technology, digitalisation can provide smarter grid management, better integration of renewable energy production and a reduction in grid congestion.[139] For security and resilience, advanced data analytics and AI models strengthen cyber resilience by detecting and neutralising threats faster.[140] And AI can create up to €100 billion per year in economic value in biomedical technology, including by speeding up the research process for new medication.[141] Digital technology is thus of great societal, economic and strategic importance.

The propositions in digitalisation and AI.

The Netherlands has the potential to contribute substantially to, and benefit from, developments in digital technology and AI. The 12 propositions submitted, presented in more detail in Appendix 1 to this report, reflect this. In total, these proposals represent over €49 billion in investment potential. The overall investment potential in the sector, and its spillover effects, are much greater still. They build on the foundations laid in recent years with the NGF, including with the

49 billion

in investment potential in the propositions for this domain

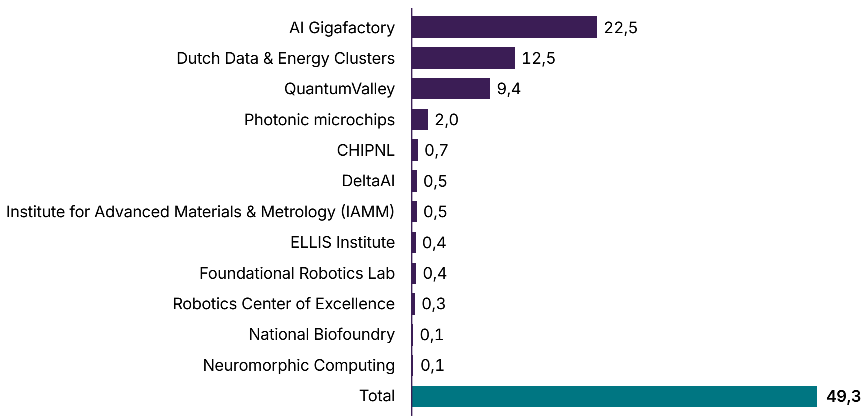
AINed, PhotonDelta and Quantum Delta NL programmes, as well as the public-private partnerships in the 'AI Coalition 4 NL'.

These propositions underscore the breadth and depth of Dutch activity in digital technology. Together with the digital infrastructure described in Chapter 3, they span the entire foundation of the digital stack, from chips to concrete AI applications in different domains. On the hardware side, propositions in semiconductors, photonics and quantum offer great opportunities. Both in further developing existing technologies and in taking leading positions in the technologies of the future. On top of this comes the 'intelligence layer', for which the AI propositions within this report give a strong idea of the Dutch opportunities. On top of that comes the application layer, where applications for people and businesses can be developed. The propositions submitted span the full breadth, from hardware to applications. Every layer in the digital stack builds on the previous one: a robust foundation lays a base for new, innovative applications in healthcare, services and industry.

On the hardware side, the Netherlands must focus on further developing its existing position and developing new niches in growth markets. In the semiconductor industry, the Netherlands is already a major player with companies like NXP and ASML. The semiconductor propositions show how the Netherlands, together with European partners, can build these strong positions into a complete ecosystem. From design and equipment to production and advanced packaging. This last link, packaging the processor so it can be connected to the outside world, is becoming increasingly complex and important for AI applications and chip energy efficiency. The production of this packaging is thus being organised closer and closer to R&D centres, and the Netherlands can take on a leading role in Europe in this respect. This requires a mature ecosystem: a broad national competence centre that supports this ecosystem could fulfil this

Figure 4.5 Project size of the investment proposals submitted in digitalisation and AI

In billions of euro (€)



The Netherlands needs a national digital competence centre to convert existing strengths into new opportunities.

coordinating role, connecting the strong Dutch hardware sector with the intelligence layer and application development. That way, innovations could be commercialised faster and the entire digital stack works well together. With these proposals, the Netherlands can build on its strong, strategically relevant position and become an indispensable link in Europe's digital ecosystem.

The proposals in quantum technology, photonics and neuromorphic computing are examples of the market potential in emerging digital technology areas. Their potential is enormous, from cryptography to contributions to making AI drastically faster and more energy efficient. The Netherlands has a strong knowledge base in this and can benefit from spillover effects from and knowledge exchange with the semiconductor industry. At the same time, the markets for the commercial application of these technologies are still developing. As described in Chapter 2, the Netherlands is struggling to scale up this strong scientific and technological knowledge, and to blend it with industrial competences and develop it into globally leading companies. Whereas NGF funding in projects such as QuantumDelta and PhotonDelta represent the first steps for ecosystem development, the current proposals create exactly the conditions needed for scale-up and commercialisation. This will allow the Netherlands to build a position in these new emerging technology areas comparable to its current strengths in the semiconductor industry. This offers great economic potential, but is also of strategic importance. Advanced applications in quantum, for example, can enable quantum-secure communication, which is essential for privacy and digital security in the Netherlands.[142] By taking leading positions in new markets, we can contribute to the digital autonomy of Europe and thus avoid becoming dependent on economic superpowers such as the US and China.

Those foreign dependencies need to be drastically reduced in the field of AI as well. Computing capability in the Netherlands must be considered a basic strategic facility: the implications of the availability of this technology for our earning capacity, as well as our healthcare, energy and armed forces, are enormous. AI is also indispensable in this domain: developing semiconductors, photonic chips, quantum applications and robotic systems necessitates storing, processing and analysing tremendous amounts of data. This requires advanced computing power, in the form of a supercomputer with a large number of graphics processing units (GPUs). The Netherlands has taken a first step in phasing out its dependencies with an AI Factory (NLAIF) in Groningen, where free access to an AI-optimised supercomputer is available. Applications can be developed here that are still in the pre-commercial phase. The AI Gigafactory proposal in this report builds on this potential. This factory has a significantly larger scale, and with it much more computing power. Because the AI Gigafactory is strongly commercially oriented, it can be fully privately funded and offer computing power at competitive market rates. By strategically connecting this computing power infrastructure to AI (Giga) factories in other European countries, the Netherlands can also contribute to a stronger European alternative to the current supply of computing power dominated by US suppliers.

But computing power alone is not enough. The AI lab[143] proposals from the ELLIS Institute and DeltaAI then use this computing power to develop AI models and

"Change is the law of life. And those who look only to the past or the present are certain to miss the future."

– John F. Kennedy, former President of the United States

applications. These propositions bring high quality knowledge and top talent together, enabling high-productivity AI incubators to emerge, with drawing power. Because where there is an attractive ecosystem, talent will follow. This will enable the Netherlands to position itself as a magnet for top international talent in AI and innovation. The models and applications developed here can be repurposed in other sectors and domains to create and sell concrete applications. The National Biofoundry proposition is illustrative of this. Using AI innovation in biotechnology, this proposition aims to improve the health of the Dutch population. A concrete example of AI applications that can improve youth health care is the method developed in the Netherlands to use AI to preventively screen hip defects (hip dysplasia) in babies. [144, 145] This innovation can prevent unnecessary hospital referrals: indeed, 56% of the babies are referred unnecessarily, resulting in the associated costs and worries for parents.

The last category of proposals focuses on robotics. Robots can alleviate labour shortages and structurally increase productivity in healthcare, agriculture and construction and logistics. Robotics is currently a largely imported technology, however: almost all robotic systems come from China, the US, South Korea, Japan and Germany. Two propositions have been included to develop positions for the Netherlands in this valuable chain. These proposals bring together engineers, researchers and entrepreneurs in multidisciplinary teams to work on breakthroughs in advanced robotics in high-tech manufacturing. These initiatives build on the rest of the propositions: they use innovative chips, far-reaching computing power and advanced AI models to develop applications that can directly increase Dutch productivity. This makes them a good example of what is possible in the Netherlands if our digital ecosystem scales up: it brings our social and economic goals significantly closer.

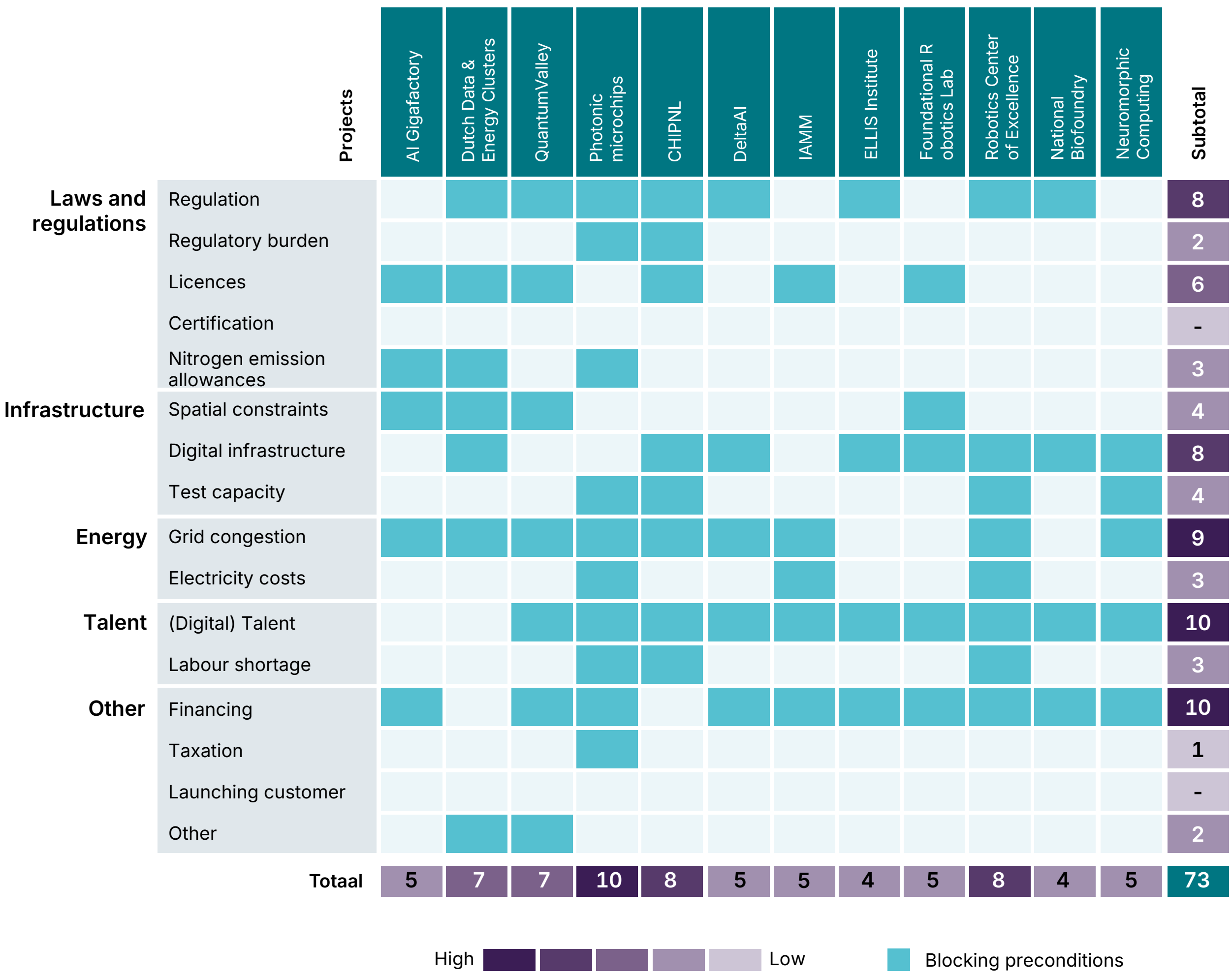
The preconditions for success in this domain

However, if the preconditions are not in place, the Netherlands will miss out on this potential. Figure 4.6 shows what the promoters of the proposed propositions in the digital domain are up against. It should come as no surprise that without robust and permanent digital infrastructure, many of the projects will not succeed. Grid congestion is also a major obstacle, especially for AI propositions that require a great deal of computing power and thus (green) power. Without available grid capacity, the development of this crucial technology in the

Netherlands is grinding to a halt. Furthermore, there is a huge shortage of digitally trained talent: towards 2030, an additional 300,000 technicians and IT specialists are expected to be needed to realise our digital ambitions.[146] As described in Chapter 3, digital talent is currently insufficiently trained and foreign talent is being discouraged from coming to the Netherlands.

Besides bottlenecks in digital infrastructure, grid congestion and digital talent, many propositions run into complex spatial planning procedures. The hyperscale directive, which prohibits the construction of large-scale data centres in 340 out of the 342 municipalities and the moratorium on data centres in Amsterdam inhibit the expansion of computing power in the Netherlands. The construction of facilities in the area of semiconductors, photonics and AI is also hampered by the urgent nitrogen problem that makes obtaining nature permits virtually impossible in several regions.

Figure 4.6 Heatmap of the preconditions for the investment propositions in digitalisation and AI



5%

The European Union has only 5% of the worldwide computing capacity, compared to 74% in the United States.

The biggest obstacle is a lack of funding, however. New initiatives in unproven markets cannot (yet) be fully privately financed due to high start-up costs and long, uncertain payback periods. Given the market potential in the digital stack, public funding - and co-funding from EU instruments - can have a flywheel effect: in the proposals in this domain, the percentage of private investment is already over 85%. To unlock those investments, targeted investment in test facilities, such as the pre-commercial production line for photonic chips in Eindhoven, is key. These kinds of test facilities are the places where scientific knowledge and industrial competences come in contact with each other in innovation eco-systems.[147] There is also a role for the government to act as a launching customer for digital innovations, by strategically deploying its purchasing power. This could mean, for example, that when developing large-scale digital infrastructure, Dutch and European providers of advanced hardware and AI technology are explicitly considered.[148] An additional challenge is that even companies that are ripe for private funding often cannot find it in Europe, because there is simply not enough venture capital available. This leads to innovative digital companies departing to the US, for example, in order to attract funding.[149] Integrating the European capital market (see Section 5.1) is therefore an important development.[150]

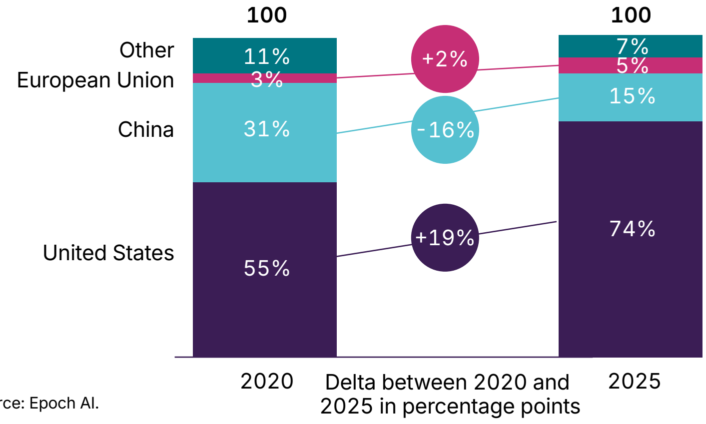
The cost of standing still

Besides the great opportunities the Netherlands has in this domain, there is also a downside: the societal costs of inaction in digitalisation and AI are enormous. The cross-cutting nature of this domain increases the impact of stagnation and disadvantage exponentially. All high-tech sectors rely on digital power. If the Netherlands lags behind in this domain, it will also have geopolitical consequences. The geopolitical power game surrounding digital technology is rising to the surface more and more markedly and frequently. The case of the International Criminal Court in The Hague, where US-based Microsoft blocked judges' access to their email and evidence because of US sanctions, aptly illustrates how digital applications are now being used as a tool of power.[151] The international relationships in the digital economy are also reflected in the supply of computing power. As shown in Figure 4.7, the US is estimated to have about 74% of the global advanced computing power, compared to only 5% in the EU. This gap means that Europe - and therefore the Netherlands - has less and less influence on the development, availability and conditions under which digital technology is supplied. Although, as an open economy, we will remain dependent on foreign digital technology, we can create more mutual dependencies if we have a strong Dutch industry, coordinated within a digitally mature Europe. This is how we restore balance in the digital domain and remain strategically relevant.

2 Hyperscale datacenters are datacenters that are larger than 10 hectares and have an electricity demand of over 70 MW.

Figure 4.7 Share of total computing capacity

Development between 2020 and 2025, as a percentage (%) of total worldwide capacity



Source: Epoch AI.

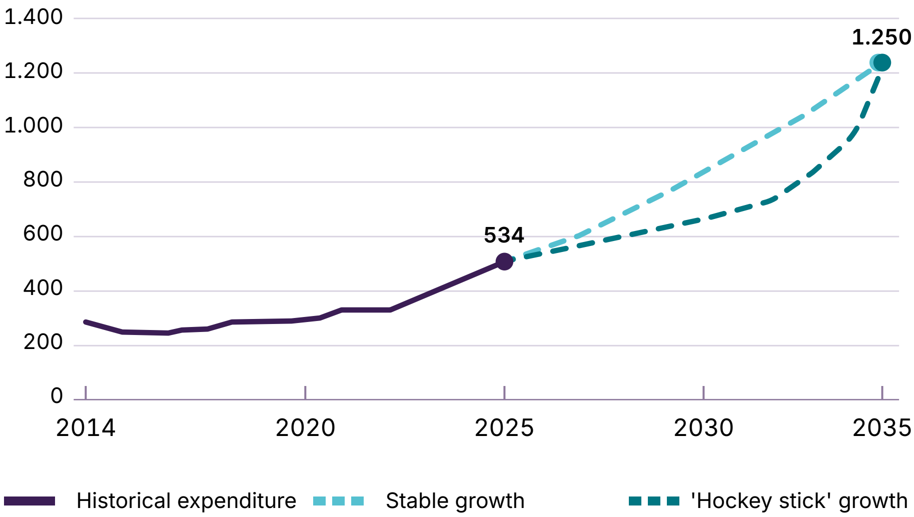
4.3. Security and resilience

Geopolitical realities have changed rapidly in recent years. Ukraine and Russia have for three years been embroiled in the deadliest European war in 80 years. European airports, including Eindhoven Airport, have been shut down by the presence of drones, and Mark Rutte, as secretary-general of NATO, is calling for a 'war mentality'. Europe and NATO are working hard to increase their defence spending to respond to this. 3.5% of the Netherlands' GDP will be spent on defence, with an additional 1.5% on defence-related spending. It is now up to the Netherlands to spend this money wisely. By developing a strong, innovative defence industry in the Netherlands and Europe, with high R&D spending and broad dual-use applications, our defence investments can yield broad returns.[152]

The huge increase in defence spending within our alliance, as shown in Figure 4.8, presents great opportunities for the Dutch defence industry. This does require a transformation. The Netherlands needs to evolve from supplier to Original Equipment Manufacturer (OEM).[153] OEM positions are essential because that is where knowledge accumulation, value creation and spillovers to civil sectors are greatest. There is also potential for this in the Netherlands: despite decades of cutbacks, several Dutch companies still have a strong base in the development and application of defence-related technologies, such as radar and sensor technology, aerospace, autonomous systems, photonics and maritime engineering. These niches not only benefit the Dutch armed forces, but can count on customers throughout NATO. They also have spillovers into other social domains. Innovations in batteries and battery technology for drones, for example, are crucial for our energy transition. This flow-through of defence technology to other societal domains is crucial for a broad societal return on defence spending.[154] Thus, by focusing investments not only on immediate operational needs, but also precisely on technological niches in which the Netherlands is strong, our investments can have a broad return.

Figure 4.8 Defence spending by European NATO members

In billions of dollars ($), forecast to 2035



Source: IISS, Military Balance+, milbalplus.iiss.org; IISS analysis.

The propositions in the security domain and resilience domain

The propositions submitted in the context of this report clearly show just how great the potential is in this domain. In total, these proposals represent about €2.9 billion in investment, as Figure 4.9 shows. The overall market potential beyond this limited survey is considerably larger, however. That the current set of proposals remains relatively limited reflects the fact that technology-driven applications in the security domain have not been promoted in the Netherlands for a long time, so this market has only recently accelerated. Many of the propositions submitted align with existing programmes that have brought about this acceleration. For example, several proposals build on ongoing NGF initiatives, such as NXTGEN Hightech for laser communication and the POLARIS programme for advanced sensor technology.[155] Leveraging this existing technology base increases the likelihood that Dutch companies can move from high-value suppliers to producers of complete systems within specific niches.

The proposals submitted for this report reinforce each other technologically and industrially, and build on existing Dutch strengths. As such, they can grow together into a strategic foundation for a modern Dutch defence industry. The development of drone ecosystems, distinctive satellite capabilities (including the associated communication network) and autonomous maritime systems create a technological network in which sensors, communication, autonomy and effector systems complement each other. This directly aligns with the requirements of modern security applications and defence applications: secure data links, eyes and ears in space, air, land and sea, protection capabilities against enemy systems and autonomous platforms for operations in complex environments. Building

The development of drone ecosystems, distinctive satellite capabilities and autonomous maritime systems create a technological network in which sensors, communication, autonomy and effector systems complement each other.

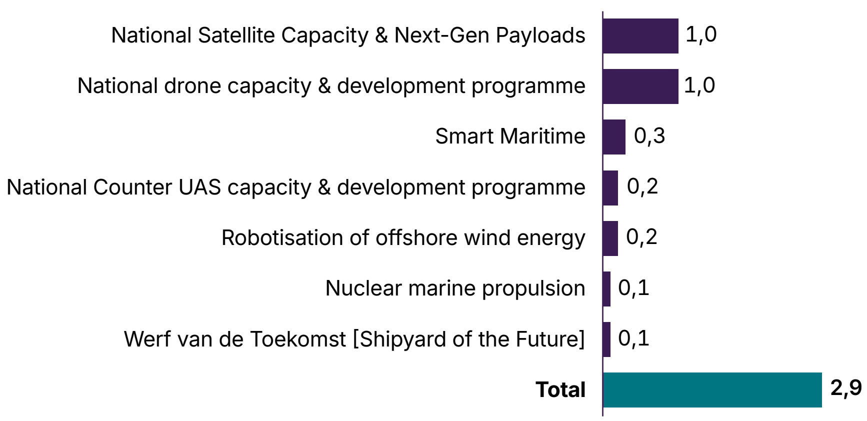
these technology clusters programmatically and with speed creates a coherent chain of research, development, testing and production - a chain that is needed to develop OEM capacity and reduce strategic dependencies.[156] Because these projects develop not just subsystems, but complete, deployable systems in which Dutch companies bear responsibility for the design, integration and overall final outcome.

The market potential of these proposals is illustrated for each subsector in Figure 4.10. For example, within the detection subsystem cluster is the proposal for complete counter-UAS (anti-drone systems) solutions, which focusses on the detection of drones. Between 2025 and 2030, the Dutch government alone will spend €11 billion on detection, and demand for this will also continue to rise within our alliances. For example, NATO and Ukraine recently launched a defence innovation initiative focusing on this.[157]

If the clusters are linked in this way to concrete operational needs from NATO and the Dutch armed forces, a predictable base demand will arise. This clear and stable demand enables companies not only to develop technology, but also to industrialise it at scale. This is precisely why it is essential that even large urgent purchases, such as the recent additional investment in resources against drones, are linked as much as possible to Dutch development and production capacity.[158] Without that link, resources mainly flow to foreign suppliers, while part of that same budget could be used to build and up-scale Dutch OEM positions. This will give the Netherlands a stronger negotiating position internationally. A government acting in this chain as a launching customer can significantly accelerate developments in the defence industry. The government then helps Dutch companies advance to higher, strategically relevant positions in European value chains.

Figure 4.9 Project size of the investment proposals submitted in security and resilience

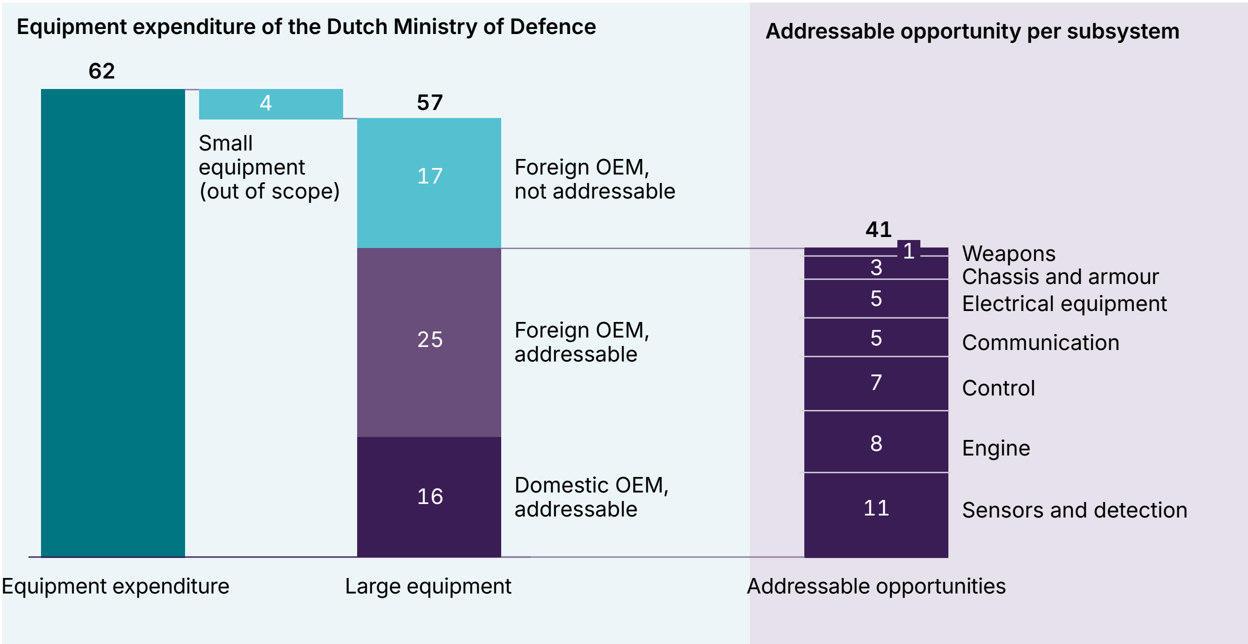
In billions of euro (€)



The propositions in this domain can, in conjunction, help realise the niche positions in which the Netherlands distinguishes itself internationally, and where Europe and NATO are seeking economies of scale and specialisation. European cooperation remains essential in this respect: within joint organisations such as the European Space Agency (ESA), based in Noordwijk, and with production agreements within the Rearm Europe programme, economies of scale, interoperability and industrial spillovers arise that strengthen the strategic position of the Netherlands and Europe. That is why the Netherlands must participate more actively in the European security economy and join in with joint industrial initiatives.

Figure 4.10 Addressable OEM segments of the Dutch Ministry of Defence

From 2025 to 2030, in billions of euro (€)



Source: Strategy&

A Dutch variant of DARPA could contribute in this domain to aggregating demand, accelerating, testing and demonstrating experimental solutions and fulfilling the role of a launching customer that is currently lacking.

The preconditions for success in this domain

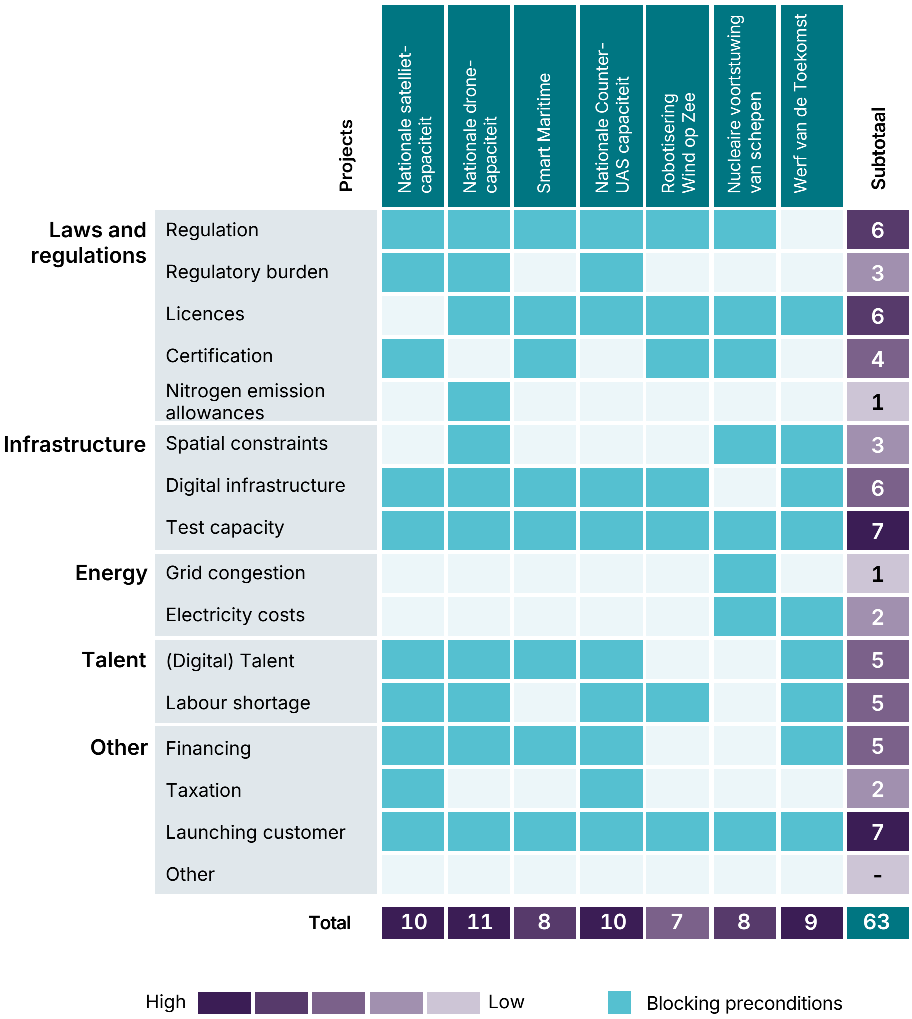
As Figure 4.11 shows, many preconditions need to be improved for our defence industry to flourish. Chief among these is the lack of a clear launching customer role for the government. In virtually all the propositions, predictable demand from the government is crucial to enable scale-up, given the lack of private buyers of defence equipment. Instruments like Strategic Defense Innovation Research (SDIR) and innovation partnerships are theoretically intended to bring speed, but in practice do not function at the scale and ambition required. SDIR is too small, too passive and not set up to actually act as a launching customer. Compared to the Dutch SDIR challenge 'Purple NECtar', companies in the US Small Business Innovation Research programme receive roughly 2 to 36 times more funding for similar innovation projects, depending on the phase.[159, 160] As a result, responsibility and funding for defence-related innovation projects remains fragmented and lacks managerial ownership, resulting in projects getting bogged down in lengthy and complex (procurement) processes despite strategic support. This lack of speed is also reflected in the bottlenecks around regulation and licences for the defence industry - all too often the implementation capacity to really push forward in this domain is still lacking.

In this light, it is important for the Netherlands to move towards a more programmatic approach to breakthrough technology - similar to how the Defense Advanced Research Projects Agency (DARPA) guides strategic development in the US. A Dutch variant of this, as further elaborated in Chapter 5.3, could contribute in this domain to aggregating demand, accelerating, testing and demonstrating experimental solutions, and fulfilling the consistent launching customer role that is currently missing.

In addition, Figure 4.11 also shows a clear need for more accessible testing and demonstration facilities. The current infrastructure is fragmented across different knowledge institutions, such as TNO, NLR, NOVA and ASTRON in space. More merging and shared facilities can give companies faster access to necessary testing capacity, and thus support innovation. In addition, the Netherlands still hardly exploits the strength of its innovation ecosystems for dual-use technology, while that is an ideal area for strategic linking opportunities. Besides stimulating collaboration within ecosystems, protecting digital infrastructure and strengthening innovation in cybersecurity is of great strategic importance. Digital sovereignty and security are a firm precondition for the high-tech defence industry - and digital talent is needed to develop and correctly apply this digital technology.

The financial sector also plays an important role in scaling up the defence industry. Defence and security companies have indicated that funding regularly grinds to a halt because ESG frameworks are interpreted too strictly in practice. Although European ESG rules do not prohibit investment in defence technology - including systems that physically disable targets or technology that neutralises threats digitally or electronically - the manner in which these frameworks are applied in practice nevertheless often leads to barriers to financing. In the current security context, a more nuanced approach is needed, in which defence companies that operate responsibly retain access to funding. We can no longer afford an overly cautious investment culture in this area.

Figure 4.11 Heatmap of the preconditions for the investment propositions in security and resilience



These preconditions are *condition sine qua non* - without having them in place, our defence industry will not develop, we will spend our defence budget on sourcing foreign products, and beyond providing security, these resources will have no positive impact on the Dutch economy and society.

The cost of standing still

Without a European and Dutch defence industry, we are at great risk. The gap in industrial capacity worldwide has been growing for years. Global drone production and supply chains are highly concentrated outside Europe, leaving European countries including Ukraine largely dependent on external suppliers.[161, 162] Figure 4.12 shows that in addition to a lack of production capacity, the European Union has a significant trade deficit on drones. Europe also lags behind in counter-UAS and space technology: the US has more than three times as much

Global drone production and supply chains are highly concentrated outside Europe, leaving European countries including Ukraine largely dependent on external suppliers.

operational satellite and launch capacity, and China invests almost twice as much in space annually.[163] European dependence on foreign suppliers for crucial security and communications technology is only increasing, therefore.

Failure to invest in our defence industry weakens the strategic relevance of the Netherlands and Europe. Between June 2022 and June 2023, 78% of all defence procurement by EU member states was spent outside the EU, of which 63% was spent in the US. Without strengthening its own production and innovation capabilities, this dependence will only continue to increase.[164] This poses risks to essential civilian functions, such as satellite communications in emergencies, disaster monitoring and the protection of vital infrastructure. In a world in which cyber attacks, drones and digital sabotage are increasingly common, continued dependence means that Europe has less weight in international relations and less grip on the security of its own society.

If we allocate our defence budget wisely within the new 5% NATO commitment, our defence industry can keep us safe, strengthen our earning capacity and produce innovative solutions to societal challenges. A strategically relevant defence industry is needed to safeguard Dutch strength and sovereignty for future generations.

Figure 4.12 Trade balance of drones per region or country, 2023

Numbers in billions of dollars

Source: OEC world.

The International Energy Agency (IEA) estimates that clean energy technology could be worth three times what it is today by 2030.

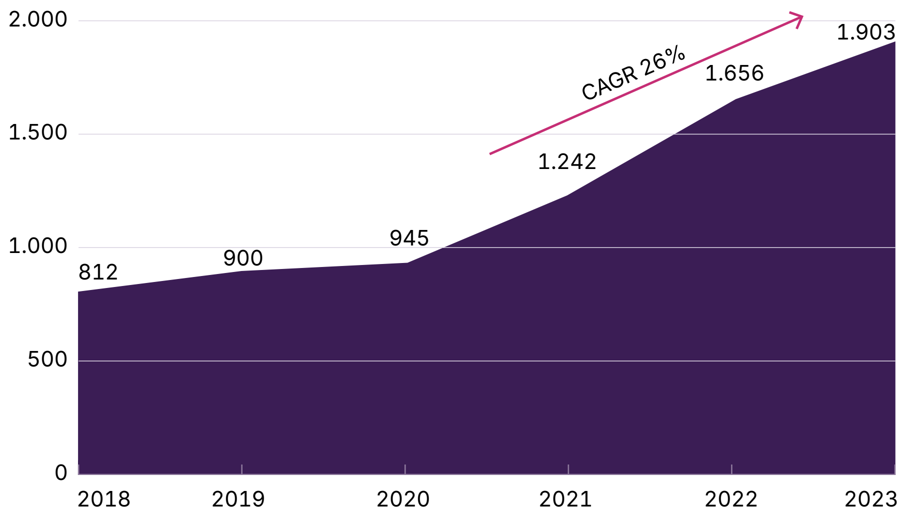
4.4. Energy and climate technology

The Netherlands and Europe are facing an enormous transition. To achieve our goal of climate neutrality by 2050, our energy supply, industry, transport, agriculture and built environment will have to become more sustainable simultaneously and quickly. We desperately need technology to do this: for many activities, including steel, long-haul aviation and cement, we simply do not yet have low-emission alternatives, or these alternatives do not yet have realistic market potential due to their high price. So innovation in these areas is crucial to meet our climate goals.

Recent history also shows that sustainable innovation on a large scale is possible. Solar power and batteries have fallen in price by 90% over the past decade, which has enabled their substantial scale-up.[165] Fully electric cars were a dream 20 years ago, a rarity 10 years ago, and constitute 37% of cars sold in the Netherlands this year.[166] And the Netherlands is not the only market for this technology. As shown in Figure 4.13, almost €2 trillion - more than one and a half times the Netherlands' GDP - was invested in sustainability worldwide in 2023. [167] And this economic potential is only increasing. The International Energy Agency (IEA) estimates that clean energy technology could be worth three times what it is today by 2030.[168] In the field of energy and climate technology, the need for sustainability converges with the enormous economic opportunities of the global transition to a climate-neutral economy. Investments in this domain are thus a triple win: they contribute to energy and resource security, to sustainability and to securing future earning capacity.

Figure 4.13 Evolution of global climate-related investments

From 2018 to 2023, In billions of dollars ($)



Source: Climate Policy Initiative.

The propositions in the energy and climate technology domain

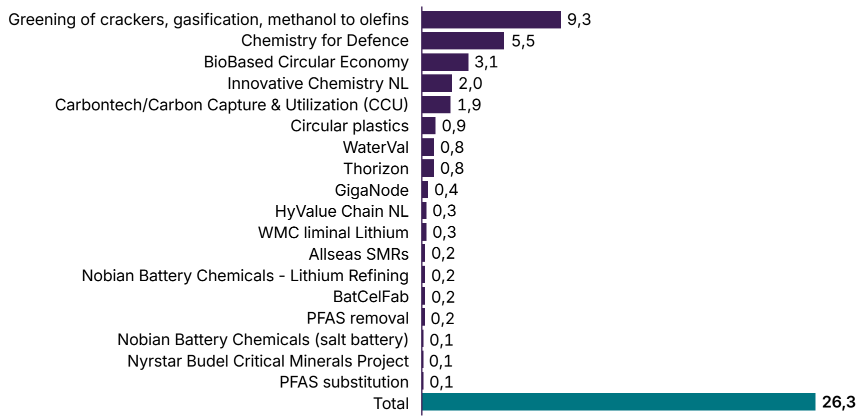
The investment proposals within this domain also show these broad societal benefits. There is a huge diversity of propositions, from (innovative) chemicals, critical raw materials, cleantech manufacturing industries and electrolysers to batteries, water and environmental technology and small modular nuclear reactors (SMRs). Many of these proposals build on NGF programmes such as Biobased Circular, Material Independence & Circular Batteries and GroenvermogenNL, which laid the foundation for this scale-up. In total, the proposals in this domain represent over €26 billion in investment potential, as shown in Figure 4.14, but the total market potential beyond this limited survey is many times larger.

These proposals aptly demonstrate the Dutch innovation drive. From green hydrogen, water technology, to salt batteries and PFAS removal: The Netherlands is a niche country that can offer unique, specialist solutions. The proposals have major societal impact. Small modular nuclear reactors (SMRs), such as those being developed by Allseas and others, could eventually provide green, decentralised energy solutions that ease pressure on the power grid.[169] They also create reliable sources of clean energy for ships and data centres, among other things. Innovations in chemistry and green hydrogen enable circular materials and clean energy and as such play a decisive role in the energy transition and in achieving climate goals.

The proposals submitted show the great potential of the chemical industry in the Netherlands: circular plastics, chemical recycling, electric crackers and green base chemicals are much-needed developments to make our industry more sustainable, and the Netherlands has competences throughout the chain. As Chapter 3 showed, this industry is strategically essential for the Netherlands. The proposals Greening Crackers, Biobased Circular Economy, Innovative Chemistry NL and Circular Plastics strengthen the competitive position of Dutch chemistry

Figure 4.14 Project size of the investment proposals submitted in climate and energy technology

In billions of euro (€)



and make this greenhouse gas-intensive industry more sustainable. In this, innovations in 'white' (industrial) biotechnology form a crucial link, using biological processes to develop new products that are more efficient and sustainable.[170] These propositions thus strengthen a broad strategic innovation chain that together can form the basis for a competitive, sustainable and circular industry in the Netherlands.

Besides the great potential of green chemistry, battery technologies are also evolving into a major growth market.[171] The BatCelFab and GigaNode proposals are characterised by an emphasis on scaling up innovative technologies to first-of-a-kind models or factories on a commercial scale. Building on previous NGF projects, they can now take the step to fully fledged battery production. The establishment of a factory for innovative anode foil and the production of high-performance cells for niche applications also builds on previous NGF investments. Where these technologies are developed determines not only how quickly transitions can occur, but also where economic and industrial value is created. These investments could enable a strategically relevant niche in battery technology, essential for, among other things, our armed forces' drones.

The propositions in this domain also offer the potential to reduce strategic dependencies. For critical raw materials such as germanium, cobalt, lithium hydroxide and silicon, we are now almost entirely dependent on China. And these raw materials are indispensable for, among other things, semiconductors, solar cells, batteries and defence equipment. By building our own raw material reserves, creating mutual strategic dependencies or treating the available raw materials in a circular way, we can prevent our lack of natural resources from becoming a geopolitical means of pressure that can be used against us.[172] With the Nyrstar Budel Critical Minerals, WMC Liminal Lithium and Nobian Battery Chemicals proposals, we phase out these dependencies by building production and recycling capabilities for critical raw materials. This can enable the Netherlands to become an important pivot in Europe's ambition to guarantee stable supplies of critical raw materials - for example, within the RESourceEU strategy.

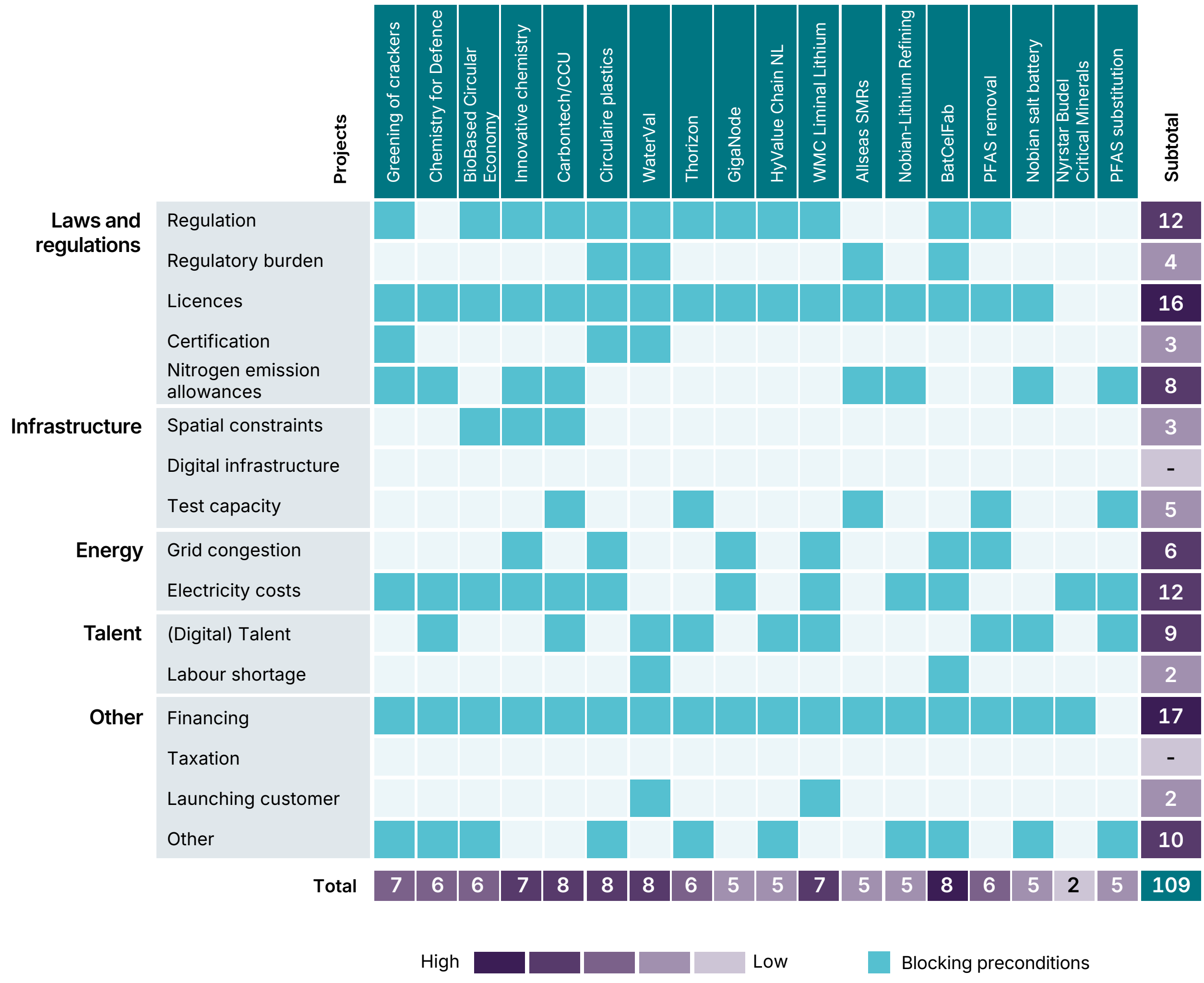
The preconditions for success in this domain

As Figure 4.15 shows, preconditions are also crucial in this domain for these investment propositions to succeed. High electricity prices are a major obstacle in sustainability propositions in the (chemical) industry, as these new technologies often require large amounts of (green) electricity. The availability of trained talent is also often identified as an obstacle: technical specialists in chemical engineering, materials science, battery technology, nuclear physics and software are scarce but sorely needed to realise these projects.

Furthermore, licences and regulations are the biggest obstacles. Many of these investment proposals require planning permission for new production facilities. But, as discussed in Chapter 3, this is often a lengthy and complex process. Moreover, regulatory frameworks are still too often hindering sustainability. For example, strict rules around the use of waste, which are much stricter than for the use of primary raw materials, lead to disproportionate pressure on businesses trying to make the circular economy possible.

Finally, these propositions are often still in relatively early stages. Many are technologically complex and first-of-a-kind. For example, there are no electric crackers at scale yet, which makes investments in setting up the first factories very risky. As a result, many of these propositions cannot yet be fully privately funded. Given the great societal importance of sustainability and the spillover effects of this knowledge and technology, public funds need to be used to encourage private funding here.

Figure 4.15 Heatmap of the preconditions for the investment propositions in energy and climate technology



"We have reached the point where, without action, we will have to either compromise our welfare, our environment or our freedom."

– Mario Draghi, former president of the European Central Bank

The cost of standing still

The potential earning capacity in this domain is enormous: in the coming decades, the world will make the switch to clean energy, industry and mobility. Not investing therefore means not only missing out on great market potential, but also further increasing our strategic dependencies. The Netherlands is now among the largest importers of critical raw materials in Europe, a significant proportion of which comes from China.[173] The Netherlands also imports tens of billions of euros worth of products that incorporate critical raw materials, such as solar panels, electronics and medical equipment (see Figure 4.16). These materials are essential for the energy, digital and industrial transition, but are almost entirely mined or processed outside Europe.

The Netherlands will remain dependent in many areas - within global value chains, this is inevitable as a small economy. However, there are areas for which we cannot be dependent, such as the chemical industry and our energy supply. Our access to clean energy and industrial products cannot depend on countries whose stable supply is highly uncertain due to geopolitical tensions. Within European cooperation, we need to reduce these dependencies and become a strategically indispensable hub of a sustainable, circular European economy. The projects covered in this report and the preconditions required for their success, are essential for this. If we do not act, our vulnerabilities will grow and we will miss out on huge economic opportunities, in one of the biggest growth markets of this century. The increasing geopolitical uncertainty, the great economic potential and the need to accomplish the transition to a sustainable, circular economy make it socially unacceptable to refrain from taking action in this domain.

4.5. Life sciences and biotechnology

We face major social challenges in our healthcare and food supply. As society ages and the number of people with chronic conditions grows,[174] our healthcare needs to remain accessible and affordable. In the meantime, healthcare soldiers on with structural labour shortages and high administrative burdens. There is a real chance that by the year 2060, one in three working people in the Netherlands will be needed in care professions.[175] Food security is also once again high on the agenda due to rising geopolitical tensions and the urgency to make our agriculture more sustainable.[176] We need to safeguard our access to healthy, affordable and sustainably produced food.

To solve these societal problems, we need medical technology and biotechnology. Developments in 'red', or medical, biotechnology can help diagnose diseases

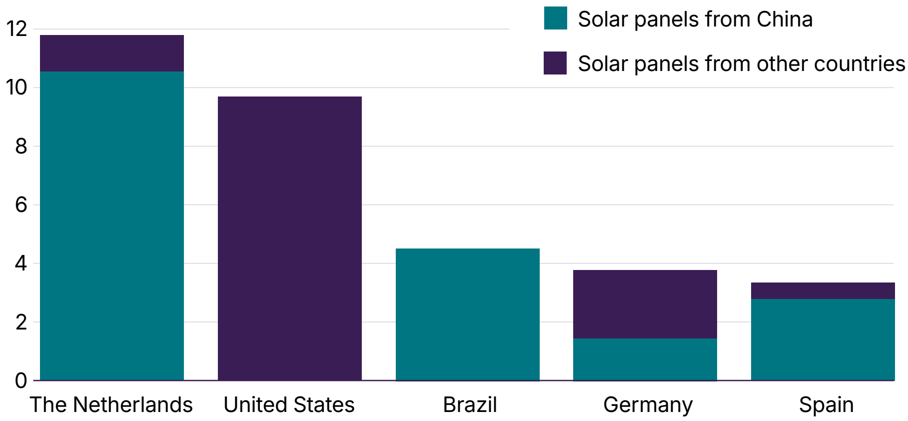
By reducing the administrative burden in healthcare or by detecting cancer, such as breast cancer, at an early stage, AI is already starting to contribute to better diagnostics and more effective care.

earlier, deploy treatments in a more targeted way and improve the quality of our care.[177] Emerging technologies, such as organ-on-a-chip, which allow preclinical trials to take place faster and with better results, illustrate how innovations can play an important role in this.[178] Medical technology also plays a key role in this. Innovations such as robotics can improve complex operations and provide opportunities to deliver better quality care with fewer people. These innovations are very important in relieving the pressure on our healthcare system and deploying medical professionals where they are needed most. AI can help here too. By reducing the administrative burden in healthcare,[179] or by detecting breast cancer, such as breast cancer at an early stage, AI is already starting to contribute to better diagnostics and more effective care.[180] As not only the Dutch population but large parts of the world are ageing, the demand for better care will continue to grow. Red biotechnology and medical technology are essential to meet that demand.

Besides these two fields in healthcare, 'green' and 'white' biotechnology are also very important for our societal transitions. 'Green' biotechnology is the foundation of our productive agriculture. With precision breeding, more sustainable cultivation methods and new proteins, our food supply is becoming both more sustainable and more secure. With Food Valley around Wageningen University, the Netherlands has a world-class innovation ecosystem with knowledge institutions and businesses active in green biotechnology. Industrial or 'white' biotechnology is needed to make the transition to a circular economy,[181] among other ways by developing biological alternatives to products that are currently fossil-based. The proposals received in this context have been addressed in the section on energy and climate technology.

Figure 4.16 Imports of solar panels

2022, in billions of euro (€)



Source: CBS, Eurostat, UN, Customs China.

37.9 billion

in investment potential in the propositions for this domain

The technology areas within this domain are of great importance in the search for answers to global challenges in healthcare and food supply. As such, they also represent a major economic opportunity. In 2025, this domain accounted for nearly €2.5 trillion in global turnover, with expected growth across the segments ranging from 5% to 13%.[182] Of this, the biotechnology market accounts for almost €2 trillion in global turnover, and the medical technology sector accounts for €550 billion, with an annual growth rate of 5 to 6%.[183]

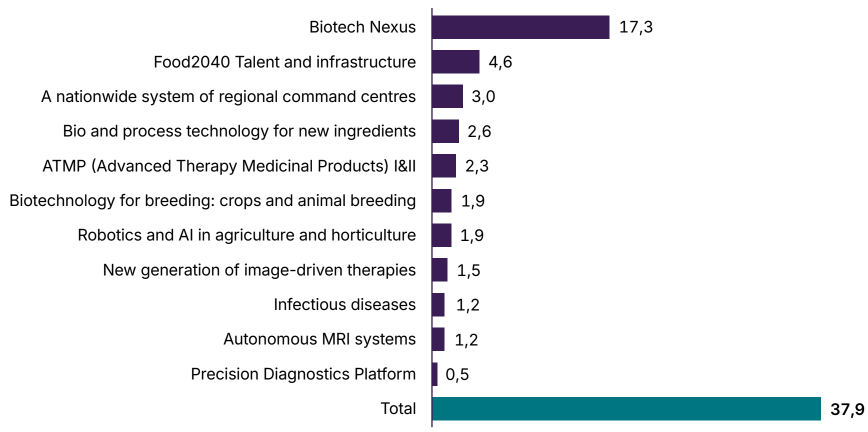
The propositions in the life sciences and biotechnology domain

The Netherlands is well placed to contribute substantially to a Europe in which life sciences and biotechnology flourish. The Netherlands is home to strong innovation ecosystems and leading university medical centres. The propositions submitted show that there are plenty of opportunities to build on that position - together they represent an investment potential of €37.9 billion (see Figure 4.17).

The Biotech Nexus proposal, for example, focuses on strengthening the whole chain of red biotechnology. Although the Netherlands has a leading scientific position here, as discussed in Chapter 2, we are poor at commercialising this knowledge. Building on NGF projects such as PharmaNL and Biotech Booster, and in collaboration with the EU Life Science Strategy, the Biotech Nexus proposal invests in strengthening the whole chain, and in particular the innovation clusters around the university medical centres, in order to achieve successful commercialisation and do so consistently. One example of this is the expansion of the Leiden Bioscience Park with an Advanced Therapy Medicinal Products campus, where innovative therapies for cancer and dementia, for example, can be developed at an accelerated pace. The propositions submitted also focus on preventive care. For example, the Infectious Diseases proposal focuses on developing non-invasive protection against viral infections. These propositions underline how societal and economic impact go hand in hand in this domain.

Figure 4.17 Project size of the investment proposals submitted in life sciences and biotechnology

In billions of euro (€)



In addition to red biotechnology, specific niches in medical technology represent a major opportunity for the Netherlands. Several proposals build on the strong Dutch position in imaging technology, for example. One of the proposals focuses on the development of autonomous MRI systems through the use of AI, which could provide both improved diagnostic outcomes and some relief for healthcare staff. AI also features in the proposal to develop the 'intervention room of the future': a platform for automated, image-guided, minimally invasive procedures by integrating AI, robotics and advanced imaging. This proposal has the potential to make complex cardiological, neurological and oncological interventions much more efficient and accurate, with fewer complications, shorter recovery times and lower healthcare costs.

Within green biotechnology, Dutch companies active in vegetable breeding are among the absolute best. Three of the 12 largest seed companies in the world are Dutch: Rijk Zwaan, Bejo Zaden and Enza Zaden.[184] Moreover, two of them are among the top 25 R&D investors in the Netherlands.[185] Technological innovations in this sector are crucial to maintain this strategic position. Not only green biotechnology, but also agrotechnology is very important here. The Food2040 proposition is a good example of how we can do this. The proposal builds a future-proof food system using AI and robotics, making production processes in agriculture and horticulture more efficient, sustainable and less labour-intensive.

The preconditions for success in this domain

To achieve the ambition expressed in the propositions, the preconditions are absolutely crucial in this domain as well. As shown in Figure 4.18, lengthy procedures and lack of testing capacity, talent and funding are the major barriers to success in this domain.

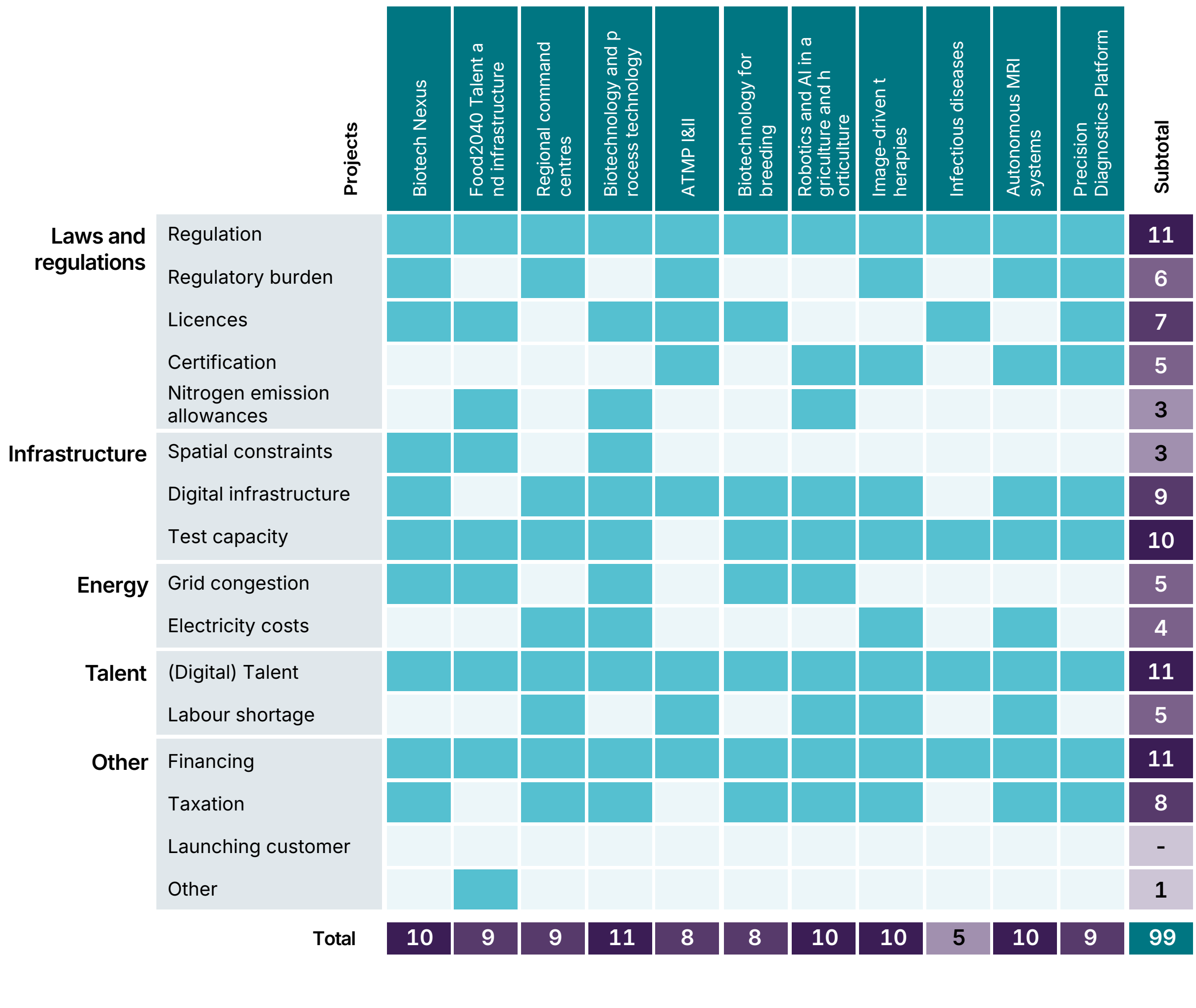
In green biotechnology, slow, complex regulatory processes are a major obstacle in the commercialisation of new innovations. Implementing new cultivation techniques or biotechnologically bred plant varieties often requires new licences that are heavily influenced by local environmental regulations. This delays innovations and limits scalability.

Businesses active in red biotechnology are also finding that the route from innovation to market is extremely slow. A telling example is that the US Food and Drug Administration (FDA) approves new medication 1.4 times faster and issues exclusive approval 4.4 times more often than the European Medicines Agency (EMA) (see Figure 4.19). Within the Netherlands itself, authorisation also grinds to a halt: medical-ethical review is complex and has long lead times,[186] licensing is complex and reimbursement processes for new therapies are lengthy and unpredictable. As a result, businesses lose valuable time in their patent period and patients get access to innovative treatments later than in other countries.[187] Together with a lack of testing capacity, this makes the Netherlands less attractive for conducting clinical trials, and means that our medical personnel only gain experience with these new innovations and resources at a time delay. R&D in this research-intensive sector consequently lags behind, putting the Dutch medical industry at a major disadvantage internationally.

The Netherlands is among the absolute top in green biotechnology: of the 12 largest seed companies in the world, three are Dutch.

The next obstacle to innovation in the Dutch market is the lack of a central, secure data structure for anonymised health data. Due to strict interpretations of the General Data Protection Regulation and other legislation, data sharing between hospitals, research institutes and businesses is complex and slow. This causes AI applications and data-driven innovations to struggle to get off the ground. The Netherlands therefore has limited participation in European programmes such as the Horizon Europe Health cluster, the Digital Europe Programme and pilots within the European Health Data Space (EHDS), which hampers the ability of Dutch businesses to scale up to European markets. Without a structural overhaul of the rules around medical innovation and data use, the Netherlands will lose strategic ground in this important domain. A stronger focus on speed and innovation is both good for patients, who will have access to new medication, and for Dutch industry, which can take an leading position internationally.

Figure 4.18 Heatmap of the preconditions for the investment propositions in life sciences and biotechnology



30%

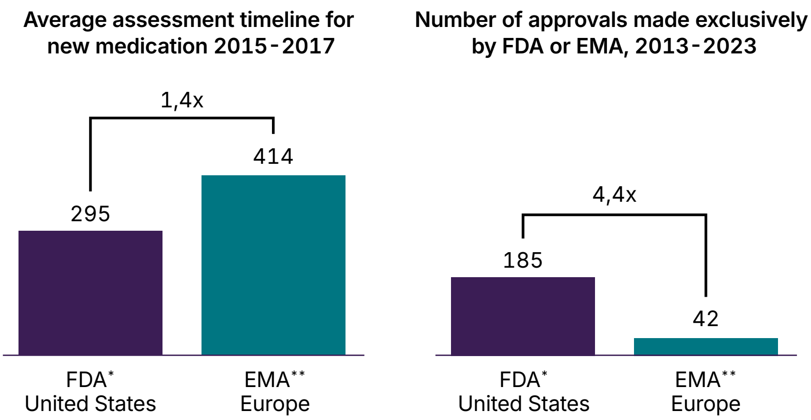
Faster approval for new medication in the US

Besides regulation and lack of testing capacity, lack of talent and funding are also fundamental bottlenecks for the life sciences and biotechnology domain. The shortage of talent with biomedical, clinical and technological expertise complicates the scaling up of new businesses and slows down the growth of knowledge-intensive clusters. This talent needs to be trained, but also actively recruited from abroad. Funding is also a significant obstacle in this domain. For example, research into new medication is extremely uncertain as well as capital-intensive, requiring financiers with a high risk appetite who can achieve the scale to effectively diversify their portfolio. Without integration of the European capital market and strengthening of the venture capital market (see Section 5.1), only a limited number of investors will have this mix of risk appetite and scale, making access to finance more difficult.

The cost of standing still

Losing ground in the life sciences and biotechnology domain comes with major consequences. If preconditions for biotechnology and medical technology do not improve, the Netherlands will become less relevant in global innovation chains. Whereas Belgium and Switzerland now earn 2.7% and 5.0%, respectively, of their GDP from red biotechnology, the Netherlands remains at just above 1.1% (see figure 4.20). Businesses establish their locations in innovation clusters where regulation, data infrastructure and market access are predictable. The Netherlands cannot offer that at the moment. Not only are we missing a major economic opportunity, but we are also missing the opportunity to use innovation to ease the pressure on healthcare and create a healthier Netherlands in which prevention curbs the growing demand for care. It also means that our dependence on essential products, such as medicines and advanced medical lab

Figure 4.19 Speed and number of unique approvals for new medication in the US and Europe



* FDA= Food and Drugs Administration (US) / ** EMA = European Medicines Agency (EU))

Source: Naunyn-Schmiedeberg's Archives of Pharmacology (via ResearchGate), Joppi et al. (2019).

Without a structural overhaul of the rules around medical innovation and data use, the Netherlands will lose strategic ground in this important domain.

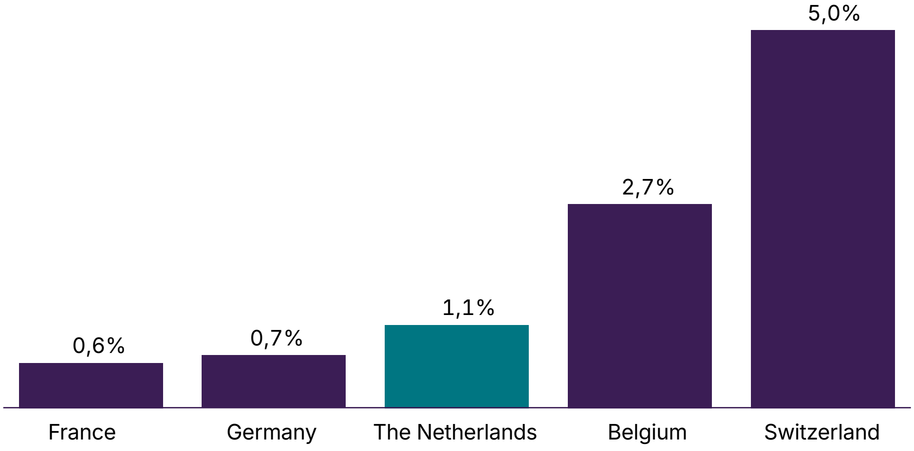
equipment,[188] continues to grow, with nothing for us to give in exchange. In a social domain as fundamental as health, this is highly undesirable.

The risks are similar in green biotechnology. The Netherlands currently has a leading international position in plant breeding and strong bioprocess and food technology, but licensing processes, data restrictions and a shortage of specialised talent inhibit further development. Green biotechnology is essential for our future: for developing climate-resilient crops, circular production and food security.[189] If development and application of this technology is hampered in the Netherlands, innovation, production and exports will shift to countries where regulations are faster and there is more room for experimentation.

These kinds of developments have a major societal impact on our healthcare, food security, and growth potential. If we do not structurally improve the preconditions, the investment potential described will not be able to take off in this domain either, and the Netherlands will miss out on economic opportunities and lose relevance in an internationally crucial domain.

Figure 4.20 Gross added value of red biotechnology

2023, as a percentage (%) of total gross added value per country



Source: EuroStat.

A national summit in 2026 with consortia, businesses, knowledge institutions and investors can help monitor progress, eliminate bottlenecks, reach agreements and accelerate implementation.

4.6. Concluding remarks

This chapter shows that the Netherlands has significant and immediately deployable investment potential. The current pipeline builds on the technological opportunities and societal challenges outlined earlier, and provides concrete prospects for how our economy can grow and build strategic relevance, once the crucial preconditions are in place. The 51 propositions submitted for this agenda thus not only provide direction but also a touchstone: where the preconditions are in place, investments can land immediately.

That is why it is essential to make clear choices in 2026 based on investment readiness, strategic importance and the availability of energy, space, talent, financing and regulation. So that projects that are ready to start can actually do so. At the same time, a future-proof economy requires a broader investment agenda that goes beyond the current pipeline. A national summit in 2026 with consortia, businesses, knowledge institutions and investors can help monitor progress, eliminate bottlenecks, reach agreements and accelerate implementation. This will ensure that the investments of tomorrow can actually get off the ground and the Netherlands will remain capable of realising societal transitions and economic ambitions.

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PART III

HOW THE NETHERLANDS CAN REALISE ITS POTENTIAL

HOW THE NETHERLANDS CAN REALISE ITS POTENTIAL

Part I and Part II show that the Netherlands faces an exceptional investment challenge within the four domains this report focuses on: digitalisation and AI, security and resilience, life sciences and biotechnology, and energy and climate technology. To strengthen earning capacity in these domains and achieve structural growth of at least 1.5% to 2.0% per year, between €151 billion and €187 billion in additional, largely private investment needs to be mobilised up to 2035. The willingness to do so is there: pension funds, banks, businesses and consortia want to invest heavily once the preconditions are in place. But investments will only be released if the government not only restores preconditions, but also creates the financial and institutional conditions to actually realise projects. This part of the report focuses on what is needed to turn this willingness to invest into realisation.

Future earning capacity must be designated a matter for top-level decision making, under the responsibility of the highest cabinet level

That starts with how the Netherlands uses public resources. The Netherlands needs to invest heavily to put the preconditions in place. Over the next 10 years, tens of billions will need to be invested in the Dutch economic base - investments that will in turn generate hundreds of billions in private investment. But these investments still need to be paid for. Within the existing budgetary space, it needs to be critically examined whether the balance between consumer spending and investment in future earning capacity is still tenable. A new cabinet must also be willing to allow a controlled increase in the national debt, for investments that will demonstrably yield economic and societal return. Moreover, public funds must be used in a way that maximises the mobilisation of private investment. For example, through tax incentives, a strong national investment institution and a national agency for groundbreaking innovation. These institutions must be able to activate Dutch institutional investors and banks as well as attract European funds and guarantees. Thus, investment projects become scalable, affordable and competitive.

But financial resources is only one side of the coin. Equally important is the administrative organisation to ensure that the right preconditions are put in place quickly to make sure projects actually get off the ground. This requires strong national direction and close contact with the Social and Economic Council (SER) and social partners. Future earning capacity must be designated a matter for top-level decision making, under the responsibility of the highest cabinet level, supported by a government commissioner with legal mandate, implementation capacity and an expert team that can operate across departments and local governments. Only with a stronger administrative structure can the Netherlands break through bottlenecks, retain private investment and accelerate project realisation.

The next two chapters show how the Netherlands can build the financial, institutional and governance foundations needed for future prosperity and strategic relevance. They show what role the government must play to activate the potential for private investment, how this course can be secured across several successive cabinets, and how the Netherlands will remain a country that supports economic growth, technological strength and broad-based prosperity in the long term. In addition, Chapter 6 shows how this and subsequent cabinets can set out the necessary choices in a stable pathway for the next 10 years, so that investments, reforms and preconditions are not only formulated, but also consistently implemented and embedded in policy.

CHAPTER 5

Towards a decisive national investment and administrative structure

To finance the investment challenge facing the Netherlands, large-scale private and public investment is required. On the private side, the Dutch financial market needs scale and stability to finance the projects and businesses that the Netherlands needs. On the public side, the Dutch government needs to reform itself. Investments must be reprioritised, and the administrative structure must be geared towards solving economic and societal problems quickly and decisively. A government that delivers is crucial for our economy as well as our democracy.

56%

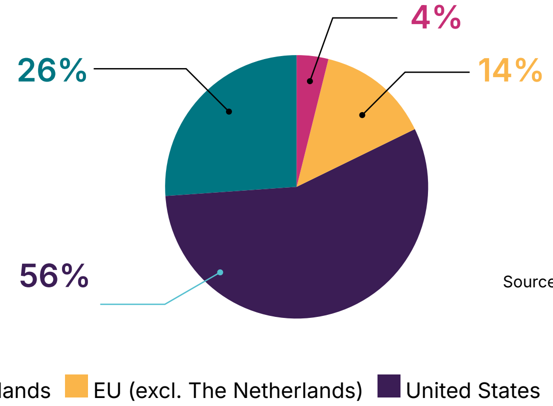
Dutch pension funds invest 56% of their shares in non-financial companies in the US compared to 4% in the Netherlands

5.1. Mobilising private investment

The Dutch investment task requires mobilising large amounts of private capital. Banks, pension funds, venture capital investors (venture capital and private equity) and individuals all play an important role here. First of all, more investable propositions are needed to ensure they can take up their role. When the preconditions are in place, the Netherlands will structurally generate more profitable projects that financiers can invest in. But more needs to be done than just the preconditions mentioned in Chapter 3. Without stable government policy, a stimulating fiscal structure and sufficient scale, the Dutch investment challenge

Figure 5.1 Distribution of Dutch pension funds' investments in non-financial companies[1]

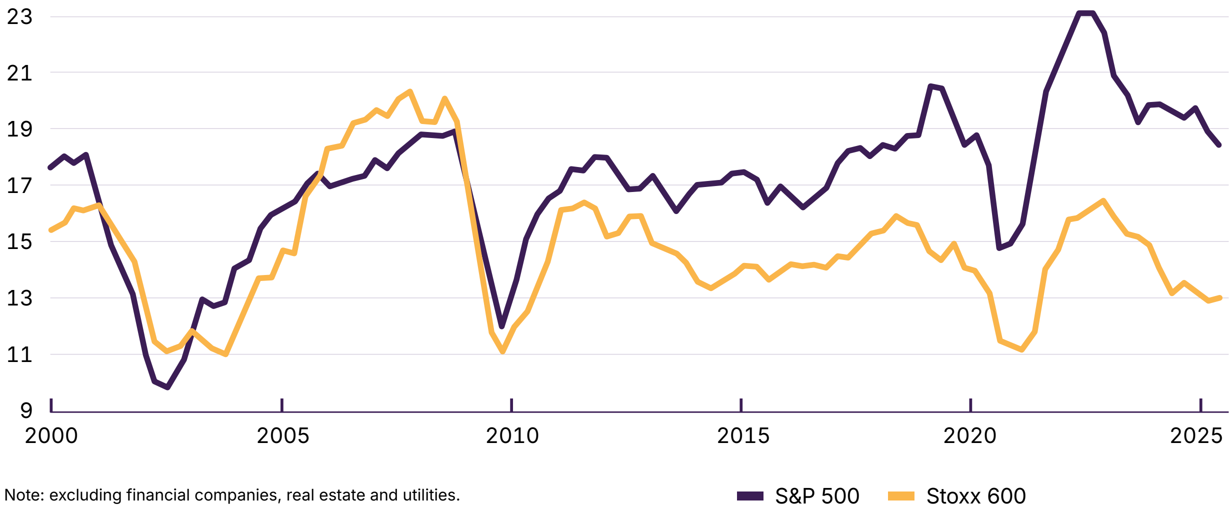
As a percentage (%) of the total invested assets



Source: De Nederlandsche Bank.

Figure 5.2 Since the financial crisis, the returns of companies in the S&P 500 (US) have been structurally higher than those of companies in the Stoxx 600 (Europe)[2]

Net profit as a percentage (%) of equity



Note: excluding financial companies, real estate and utilities.
Source: Bloomberg Finance LP, Deutsche Bank.

cannot be met. In addition, specifically for the high-tech, innovative companies operating in the four domains of this report, a mature venture capital market is indispensable. Venture capital is widely needed to allow innovative companies to scale to the level where they can compete globally.

A lack of return

As shown in Figure 5.1, Dutch pension funds invest significantly less in Dutch (€23 billion) and European companies (€97 billion), than in US companies (€293 billion). The US market is now four times larger than the European one, and as Figure 5.2 shows, also substantially more profitable. The return on US investments averaged 14% over the past five years, compared to only 7% in Europe. Given the scale and returns of the US market compared to the Dutch, it is not surprising that pension funds - which want to contribute to the societal challenges in the Netherlands, but also have a responsibility towards their participants - invest more in the US.

In order to make it more attractive for pension funds and other private financiers, such as banks and insurers, to invest in the Netherlands, it is essential that their investments yield adequate returns. The most important step to realise investment propositions that provide a good return is to create the right preconditions in terms of regulation, talent, energy and infrastructure, as described in Chapter 3. With good preconditions, large-scale investments can again take place and pay off. If investment funds, including the €1,600 billion managed by pension funds,[3] cannot find enough profitable investments in the Netherlands, it is more than a missed opportunity. Without sufficient investments, structural growth of at least 1.5% to 2.0% is out of reach and earning capacity will leak away to other countries.

79.5%

Of companies find the stability of Dutch government policy somewhat to very poor

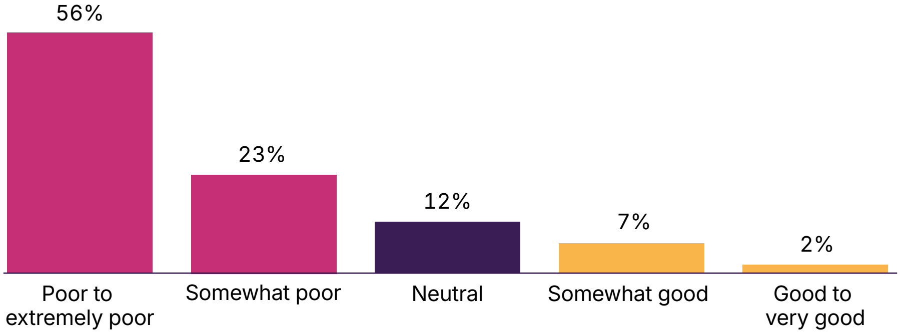
Without stability, investments will not take off

Besides good preconditions, a good investment climate requires, above all, stability. Without stable and long-term policy, there is too much uncertainty for investors with long time horizons. Investments in infrastructure projects, for example, will not earn their money back for decades, so an investor must have confidence in stable government policy. Currently, however, only 7.9% of Dutch businesses see government policy as stable or somewhat stable, as shown in Figure 5.3.[4] Short-sighted or unpredictable decisions make companies and investors reluctant to make long-term investments.

There are plenty of examples that underline that the government is not a stable and predictable partner at the moment. For instance, in early 2025, the importance of the Long-Term Space Agenda was endorsed by the current cabinet. In October, however, cuts to the Dutch contribution to the European Space Agency (ESA), where the government wanted to reduce its contribution by 25%, were nonetheless announced. When the impact of the cuts for this high-tech sector became clear, they were reversed a month later. Although the Netherlands now does ultimately make a substantial contribution, the harm has already been done: the Dutch government does not come across as a reliable partner. Investors are steering clear of the Dutch heat grid for the same reason. Continuous policy changes on this dossier simply make it impossible to make an investment plan. This not only leads investors to invest their capital elsewhere, but also means that citizens end up paying higher prices for heating their homes, and delays the energy transition. A similar example is Lelystad Airport, where years of delays and shifting decisions have not only created uncertainty but also led to unnecessary public costs. Investors are thus reluctant to commit to projects with long horizons and strong dependencies on government policy. The more this confidence declines, the greater the challenge of raising capital becomes.

To restore trust between the government and private funders, the government needs to invest in stable, long-term partnerships with social partners and the private sector. Without a credible long-term vision and political stability, investors simply cannot rely on the commitment of the national government. To accelerate

Figure 5.3 Stability assessment of Dutch government policy



Source: Business Climate Monitor 2025.

Without a credible long-term vision and political stability, investors simply cannot rely on the commitment of the national government.

this restoration of confidence, public-private partnerships can create trust and mobilise capital that does not need to come from the Dutch treasury. In addition, private investors bring not only money but also valuable knowledge about best practices abroad, creating additional value for the projects they invest in. Public-private coordination thus brings down costs for citizens and businesses.

The tax system must make investing in our future attractive.

Stability of policy goes hand in hand with stable, stimulating tax treatment. While the Netherlands traditionally had a relatively competitive tax regime, recent international comparisons show that the effective marginal tax burden is now among the highest in the EU.[5] An accumulation of measures, such as restrictions in interest deduction, depreciation and loss offsetting, means that taxes are increasingly being levied at times when investments do not yet yield a return in economic terms. As a result, new projects take longer to become profitable, long-term investments become less attractive and businesses move to countries where investments can be recouped earlier and more predictably. Against the background of the major transitions coming to the Netherlands, this is worrying: a fiscal system that facilitates rather than discourages investment is a prerequisite for mobilising private resources at scale.

To achieve this, the Dutch tax system needs to be better aligned with that of competing EU member states. This requires, first of all, a reduction in the effective marginal tax burden. There are dozens of tax schemes that fail to achieve their purpose, complicate the tax system, and where the money involved could be used more effectively. The Self-Employment Deduction is an example of such a scheme, which mainly rewards being an entrepreneur rather than actually doing business. Phasing out these schemes could raise tens of billions over time, which could be used to cut taxes on labour and profits and make investments in the future.[6] Reforming the tax system must be framed with stability and simplification in mind, with tax incentives targeted at the most innovative activities. For instance, innovation-promoting tax schemes, such as the Research and Development (Promotion) Act (WBSO) and Innovation Box, must be maintained and the investment allowance scheme must be expanded in a targeted way.

Fragmentation limits our investment power

Besides yield, stability and tax incentives, scale is the final key to mobilising private capital. Scale is needed to spread risk effectively, especially when investing in risky, young businesses. The recent example of venture capital fund Innovation Industries shows that large financiers are willing to make riskier investments once there is sufficient scale: the fund raised €500 million to invest in companies operating in complex technologies (deep-tech companies), with the participation of pension funds, banks and an insurer.[7]

Yet the example of Innovation Industries is more the exception than the rule. This level of scale lags in many cases due to the fragmentation of the European capital market. Whereas the US has huge investment funds thanks to an integrated market, the European capital market is small and fragmented. Every member state has its own financial landscape, so European investment funds cannot achieve the scale to sufficiently diversify large, risky investments. European

600 billion

10 trillion in EU households' savings are currently in low-yield savings accounts, 600 billion of which in the Netherlands

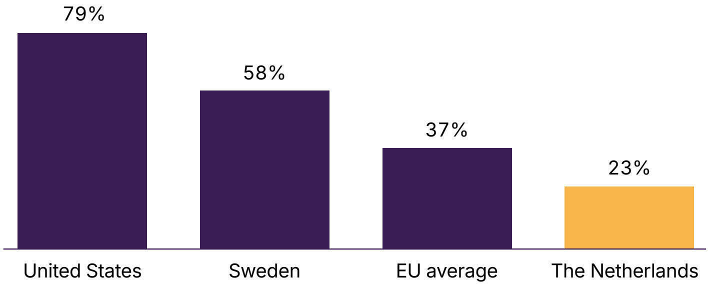
integration of capital markets and measures to make it easier to raise finance in multiple countries are therefore crucial to achieve the scale needed to finance the Dutch transitions.[8] This ties in with the European Council's recent call to complete the single market by 2028.[9] If consensus cannot be reached at EU level, the Netherlands must take the initiative with other proponents and start a coalition of the willing in harmonising regulations.

Harmonisation of the European capital market is also an opportunity to activate savings, in addition to private capital from large financiers, and thus further enable households to benefit from new investment opportunities. €10 trillion in EU households' savings are currently in low-yield savings accounts, €600 billion of which in the Netherlands.[10] This money contributes very little to strengthening Europe's investment power. Creating a European savings and investment union, as part of the capital markets union, will help get savings flowing into investments faster.[11]

National measures are also necessary, as the disparities within Europe are also great. Figure 5.4 shows that Dutch households hardly invest their savings, while the percentage of direct investments in Sweden is more than twice as high. This is both a missed opportunity for financing societal tasks and for the individual wallets of Dutch citizens. To release savings, the Netherlands should introduce an investment savings account following the Swedish example. There, it has led to more investments and a significantly higher return on savings for citizens.[12]

Figure 5.4 Share of investments by households[13]

As a percentage (%) of free financial assets



50 million

We need funds of a substantial size to make investments of more than 50 million

Limitations of the Dutch venture capital market

The lack of European integration is aptly reflected in the venture capital market. This risk-bearing capital is indispensable in the start-up and scale-up phases of high-tech companies. Growing businesses in the four domains covered in this report rely heavily on venture capital to scale up. Not only the funding that venture capital provides, but also the expertise that experienced investors bring to the table are key to taking companies to the next level.

However, the Dutch venture capital market lags behind those of, for example, the US, Sweden, Singapore and Israel. Recent analyses show that the US venture capital market, measured as a share of GDP, is more than six times larger than the European one and three times larger than the Dutch one.[14] So the Netherlands is doing relatively well within Europe, but lags substantially behind globally. The US therefore has significantly more capital available for capital-intensive technology companies, prompting many companies to cross the Atlantic to raise funding there.[15] US investors also tend to have more expertise. In mature venture capital markets, investors have more experience in technology development, entrepreneurship and scale-up, which makes capital allocation more efficient and the advising they can provide their portfolio companies sharper. The larger scale also allows room to build more specialised knowledge, which helps finance start-ups and scale-ups operating in complex technologies (the deep-tech segment).[16]

The Dutch venture capital market also lacks diversity. The venture capital market is less accessible for groups that in other places, the US, for example, contribute above average to the creation of high-growth companies, such as entrepreneurs from migrant backgrounds and women entrepreneurs.[17] Between 2008 and 2019, only 0.8% of venture capital investments ended up with teams comprising only women. The Netherlands is consequently leaving a great deal of entrepreneurial potential untapped.[19]

Strengthening the Dutch venture capital market requires increasing its scale, professionalism and diversity. Increasing scale will require fund investments in larger Dutch investment funds, in addition to capital market harmonisation.[20] We need funds of substantial size to make investments of more than €50 million. There is limited funding currently available for this.[21] In addition, by making it fiscally attractive, following Sweden's example,[22] for former entrepreneurs to reinvest their assets, both their resources and their experience can be mobilised for Dutch technology companies. Finally, the government must play a developing role in accelerating the growth of underdeveloped segments of the venture capital market.[23] Supporting first-time fund managers from underrepresented groups in the ecosystem broadens the pool of investors. The same approach can strengthen the still underdeveloped deep-tech segment, which is essential for building technological niche positions in the four domains covered in this report.

Conclusion and recommendations

Investors need returns, stability, scale and a stimulating tax system to support the Dutch investment challenges. This is the only way to mobilise the capital available in the Netherlands for strategic projects that are important to structurally grow the economy by at least 1.5% to 2.0%. In particular, a functioning venture capital market is very important because young, innovative growth companies depend on venture capital coming from that market.

1. Build a stable investment climate

- Set realistic policy beyond the annual budget cycle and adhere to that policy. Strengthen public-private partnerships, for example around large infrastructure projects, to increase trust between government and investors.

2. Create a stable and stimulating tax system

- Reduce the effective marginal tax burden on labour and profits by scrapping inefficient tax schemes. Harmonise our taxation with competing EU member states.
- Encourage investment by maintaining innovation-stimulating legislation and broadening the investment allowance scheme for investments in innovative sectors.
- Introduce a tax-efficient Dutch equivalent to the Swedish investment savings account to activate household savings and link them to national investment priorities.

3. Force the creation of the European capital markets union

- Force the creation of a European capital markets union by 2028, including a European savings and investment union.
- If consensus cannot be reached at EU level, the Netherlands must take the initiative with other proponents and start a coalition of the willing to undertake harmonisation initiatives on a smaller scale.

4. Strengthen the Dutch venture capital ecosystem

- With more fund investments, ensure that Dutch funds can achieve sufficient scale to provide growth capital to high-growth companies.
- Increase expertise in the market via an 'entrepreneurs for entrepreneurs' reinvestment scheme.
- Provide more targeted support to first-time fund managers from underrepresented groups and fund managers who focus on the underdeveloped deep-tech segment.

5.2. Create public investment space for critical preconditions

The costs of the preconditions

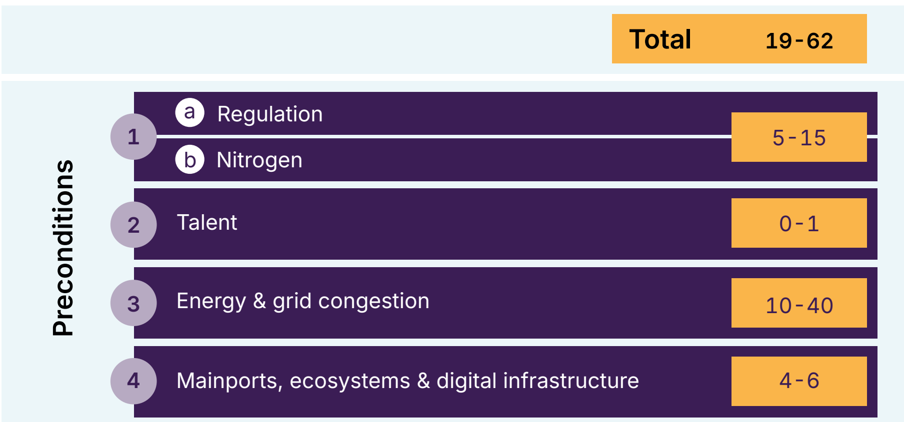
On their own, the financial reforms described above will not have the desired effect if the preconditions from Chapter 3 are not in place. Without these preconditions, there are simply not enough investable propositions to achieve the required 1.5% to 2.0% growth. This overdue maintenance in the economy therefore needs to happen as soon as possible, and this requires public funding. Although this is not true for every recommendation: for some, the costs are limited to negligible, such as scrapping the gold-plating of EU legislation and introducing regulatory sandboxes. Some recommendations even have a direct positive impact on the treasury, such as attracting highly productive migrant workers. But many of the recommendations in this report require substantial public investment. We give an initial indication of the total cost, spread over 10 years, in Figure 5.5.

To generate at least 1.5% to 2.0% growth by 2035, tens of billions must be invested in total in the Netherlands' economic base over the next 10 years.

For a number of recommendations, the costs can be reasonably well estimated: for example, reducing the electricity tax for bulk users to the European minimum will cost around €1.2 billion per year. But the total size of the investments needed to make energy prices competitive in the medium term is still very uncertain. The ultimate costs largely depend on the potential to reduce system costs, which depends on the speed and impact of (technological) innovations in this area. The cost of conclusively solving the nitrogen problem is also uncertain. Depending on the potential of agricultural innovations, €4 billion to €13 billion in additional funds are needed.[24, 25] Both dossiers show the importance of stimulating technological development and innovation, and the positive flywheel effect they

Figure 5.5 Initial cost indication of the preconditional investments needed by the Netherlands over the next 10 years*

In billions of euro (€)



* See Appendix 4 (online) for an elaboration of the estimates.

can generate. Where the Netherlands manages to generate additional innovation, the costs of solving bottlenecks for new innovations can be cushioned.

Due to the positive effects of attracting highly productive migrant workers, and the reprioritisation of resources within existing budgets, the recommendations under talent come out at around net zero. For the mainports, innovation ecosystems and digital infrastructure, initial indications have been included of the stimulus needed to keep them competitive in the medium term. In this estimate, we have deliberately focused on the mainports and major infrastructure clusters. No costs have yet been included for strategic innovation ecosystems, as their investment needs depend heavily on the timely realisation of the preconditions from Chapter 3.

What is clear is that to generate at least 1.5% to 2.0% growth by 2035, tens of billions must be invested in total in the Netherlands' economic base over the next 10 years. With costs of €2 to €8 billion a year, about 1% of the total budget, the scale of these investments is certainly not impossible. And these investments in our economic strength will pay off handsomely. Only grid congestion and nitrogen constraints will both result in tens of billions in gross turnover losses over the next few years. Resolving the bottlenecks in the economy quickly and decisively can enable hundreds of billions in private investment.

Our current budgetary system does not value investments

This is not the first report to highlight the importance of investments. Besides the Draghi report,[26] the Central Economic Commission[27] and the Council of State[28] also underscore the need for targeted investing in the future. Yet investments in the preconditions are still not forthcoming for the time being. A major reason for this is that long-term investments are not valued highly enough. The benefits of public investments are often not included in estimates. For example, when calculating election programmes, the CPB only qualitatively considers the long-term economic benefits of investing in education and R&D.[29] This gives politicians an incomplete picture of the returns on these investments.

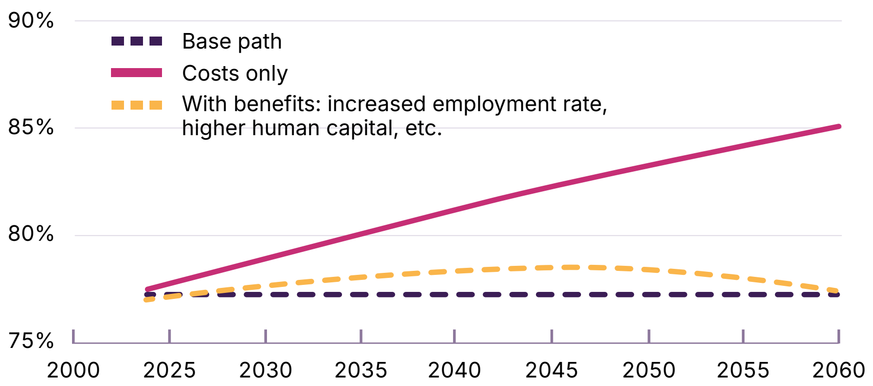
Another striking example is how international students are valued. Controlling the influx of international students is seen in Schoof cabinet's coalition agreement as a saving of €293 million: a net gain for the treasury. However, the CPB has calculated that in the long run, these students bring the Netherlands two to 10 times more than they cost.[30] Moreover, that calculation does not even include the indirect benefits of international talent for the Dutch technology position. By similar mechanisms, there is also structural underinvestment in preventative healthcare.[31] Another illustrative example is the cutbacks to the National Growth Fund (NGF) to be able to reduce fuel excise duties. On paper, this was 'coverage' -
a net zero effect on Dutch public finances. However, because of the NGF cutbacks, investments in research and innovation, so important to our growth and competitiveness, went up in smoke. The bill for today's purchasing power expenditures is being handed to future generations. The focus on the short term, on the next financial year, continuously leads to short-sighted decisions with major consequences for the future and health of the Netherlands.[32]

The bill for today's purchasing power expenditures is being handed to future generations.

To ensure our future prosperity, long-term investments must be valued correctly. By explicitly taking the clear benefits of investments into account in budgetary decisions, these investments can be better balanced against consumer expenditures that contribute little to future prosperity. Separating consumer expenditure from investment expenditure via a 'golden rule' is often suggested, but it also has drawbacks. This method was previously used in Germany and the UK, which resulted in definitions of investments being stretched ever further, as a result of which the desired effect was not achieved: in the end, almost every expenditure was still classified as an investment.[34, 35] A system where these definitions could be monitored outside of political pressure could work, but requires an independent arbiter. A Commissioner for Future Prosperity (see Section 5.4) can play a role in this. Another option is a system in which for large government expenditure that is potentially productivity-enhancing, the benefits are mapped as far forward in time as possible. This is complex, and it is not realistic for every policy proposal, but it is essential for a proper valuation of investments. For example, Figure 5.6 shows how additional investments in early childhood education is wrongly analysed because only the expenditure is estimated. The productivity-enhancing effects of this policy on the debt ratio are not taken into account, which gives politicians a false picture of the financial effects of the policy. There are already proposals from the Institute of Public Economics[36] and the House of Representatives[37] to implement such a system. These proposals need to be worked out in practical terms to give politicians a richer and more accurate picture of the impact of their financial decisions.[38] Consumer expenditure can thus be more balanced against investments.

Figure 5.6 The long-term financial effects of additional investments in early childhood education on the Dutch debt ratio

Debt ratio as a percentage (%) of gross domestic product



Source: IPE analysis.

Given the scarcity of financial resources, the room for nitrogen emissions, energy infrastructure and implementation capacity, it is also not enough to just invest more.[294] These scarcities call for a sharp prioritisation: public funds need to flow to the investments that will enable the necessary economic growth of at least 1.5% to 2.0%. This applies both for investments in knowledge and innovation and for choices in the physical living environment (such as space utilisation, housing, infrastructure and the energy system). This implies making decisions on what we do want to do, and what we do not want to do, or what we want to do less of: we must focus on high-productivity sectors in the economy, and not on low-productivity economic activities. The existing Social Cost-Benefit Analysis (MKBA) provides only limited guidance for this: it assesses individual projects, but not whether scarce resources and space are being put to their most productive use.[39, 40] A complement to the current MKBA is therefore needed, with a prioritisation framework that systematically ranks public investments according to their contribution to achieving at least 1.5% to 2.0% structural growth.'

Cutbacks to the civil service must be implemented in parallel with a reduction of the regulatory burden so that the public sector focuses on service provision rather than bureaucracy.

How we properly use our public resources for our future prosperity.
Unfortunately, better information and prioritisation do not in themselves create additional budget leeway. Choices still need to be made, choices for the necessary investments in high-productivity sectors. Given the scale of the investments needed to put the preconditions in place for our future prosperity, that means tightening the belt on consumer spending. Cost-saving measures in healthcare need to be scrutinised, for example by accelerating AI deployment. Investing in preventative healthcare can also contribute to this, and the rapidly rising costs in elderly care need to be cushioned. Politically opportune measures aimed at improving short-term purchasing power must be avoided as much as possible. Cutbacks to the civil service must be implemented in parallel with a reduction of the regulatory burden so that the public sector focuses on service delivery rather than bureaucracy. Also, given the scale of the investments required, implementation and absorption capacity must be carefully considered. Budget underutilisation is now a chronic problem in the Netherlands due to unrealistic implementation plans. As a result, money is set aside but not spent, when it could have been better used elsewhere.[41] Looking closely at government expenditure now can create budget leeway for the investments that are needed to keep our social services affordable in the long term.

In this context, the asset positions on the current government balance sheet must also be critically examined. For example, the Dutch government owns large shares in non-strategic state participations - assets that could be used more effectively for Dutch earning capacity. Whereas participations like Schiphol, the Port of Rotterdam, and TenneT are strategically crucial, Holland Casino, TenneT Duitsland, Volksbank and ABN AMRO are not. The sale of these could free up tens of billions in the foreseeable future which could be used to make productive investments in the Dutch economy.[42] These funds must not be used for consumer expenditure, but rather for long-term, productive investments in future prosperity, for example via the aforementioned investments in preconditions or via a capital injection into a National Investment Bank or a National Agency for Groundbreaking Innovation (see Section 5.3).

"Not everything is possible, and it is definitely not possible to achieve everything at once"

– Former prime minister Willem Drees

The sale of non-strategic state participations could free up tens of billions in the foreseeable future which could be used to make productive investments in the Dutch economy.

To make the smartest use of our limited resources, European co-financing must be used as much as possible. With programmes like Horizon Europe and Digital Europe, this leverage is already being effectively deployed. This meant that for every euro invested, twice as much was returned. Large investments can also be mobilised through the European Investment Bank; for example, the EIB recently provided one billion euros to NXP to strengthen its strategic chip capacity in Europe.[43] Yet the Netherlands is still not making enough use of these opportunities: for one of the IPCEIs (Important Project of Common European Interest), the Netherlands made only €70 million available, while Germany freed up ten times this amount.[44] Since the new European Competitiveness Fund's four policy windows will focus on the four strategic domains from this report, the Netherlands must ensure that co-financing budgets are available to land as many European investments in the Netherlands as possible.

Finally, it must be possible to increase our government debt where this is justified. For the time being, the Dutch national debt is significantly lower than that of surrounding countries. For expenditure that clearly contributes to the required 1.5% to 2.0% economic growth, such as expenditure on knowledge, innovation or energy infrastructure, it may be justified to let the national debt increase. In this way, the national debt can enable investments with a large economic flywheel effect that would otherwise not materialise, and recoup this money in the medium term.

Conclusion and recommendations

The Netherlands still has the financial room to make necessary investments in our future prosperity. This does require a change in attitudes: public finances need to be better geared towards productivity-enhancing investments. The budgetary system must be adjusted to ensure that the right political incentives are created to make the necessary choices for the future of the Netherlands.

1. Invest in the Dutch economy

- Fully calculate the costs of the preconditions required to achieve growth of at least 1.5% to 2.0%. Include these in the budget.
- Explicitly prioritise a high-productivity economy. Commit scarce resources to high-productivity sectors over low-productivity activities.
- Cap the cost increases in consumer expenditure in the national budget and avoid occasional purchasing power increases at the expense of investments in the Netherlands' future prosperity.
- Sell off non-strategic state participations and use the proceeds for necessary investments in the preconditions or a capital injection into the National Investment Bank or a National Agency for Groundbreaking Innovation (see Section 5.3). Avoid using these proceeds for consumer expenditure.
- Allow state debt to rise for necessary investments with proven returns and large societal benefits, such as in energy infrastructure, knowledge and innovation.

2. Create a budgetary system that correctly values the benefits of investments

- While respecting their independence, encourage the further development of economic forecasting models at planning agencies and knowledge institutions so that long-term effects of productivity-enhancing investments - such as in R&D - can be better factored into budgetary and policy decisions.
- Based on this, introduce a system into the budgetary policy that clearly distinguishes between consumer expenditure and investments. Test and prioritise policy proposals with a high financial impact by default based on their contribution to the necessary economic growth of at least 1.5% to 2.0% per year.

Unlike other countries, the Netherlands does not have a powerful national investment bank that can organise both risk-bearing corporate finance and large-scale project finance.

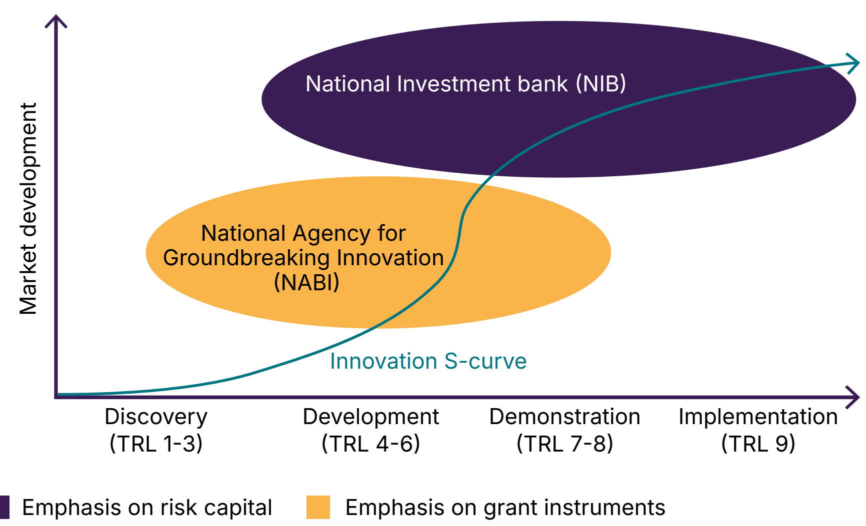
5.3. Public investments in the technology chain

Besides the necessary public investments to put the preconditions in place, the government plays an indispensable role in stimulating the entire technology chain: from technological development to scaling up to industrial production. The government is still not taking up this role adequately.

We think too small in the Netherlands. Groundbreaking ideas are not appreciated enough, while they are sorely needed to strengthen our technology position as well as solve societal problems. Our excellent knowledge institutions can play a bigger role in this, provided we encourage them to become more entrepreneurial. They are also crucial links in our innovation ecosystems. But with the loss of the NGF, there is no longer an instrument that provides long-term support for large-scale public-private innovation cooperation, especially in the early development stages. That loss needs to be corrected.

On top of that, the Dutch instrument landscape is fragmented: a wide variety of schemes are spread across different organisations. As a result, entrepreneurs often cannot see the wood for the trees. Finally, funding for scale-up is a sticking point. Ultimately, we need to not only develop ideas, but actually be able to scale them up. That is precisely where the Netherlands is now missing out on opportunities. Scale-ups looking to raise more than €50 million in funding will find it difficult to do so in the Netherlands. This increases the risk that these companies will move abroad.[45]

Figure 5.7 Role of the NABI and the NIB in the technology chain



Inspired by: Netherlands Enterprise Agency (RVO) Consultation on Demonstration Energy Innovation 2019.

It is vital that the Netherlands gets better at industrialising strategic technology.

To improve this, we need a coherent funding mix that supports promising ideas from lab to shelf (i.e., across all Technology Readiness Levels; TRLs[46]) and that is aimed at mobilising private investments. That mix must take into account the varying risks associated with different development phases. Each development phase requires appropriate support: from grants in the early phase to (near-market) loans and investments in later phases. This calls for some targeted measures.

National Investment Bank

First of all, for a future-proof economy, the Netherlands must become much better at industrialising strategic technology, by using public capital to activate private investments. This requires a structurally different way of funding than the current fragmented support landscape allows.

Unlike other countries, the Netherlands does not have a powerful national investment bank that can organise both risk-bearing corporate finance and large-scale project finance. Invest-NL, Invest International and the network of regional development corporations certainly make valuable contributions, but lack scale. For example, BpiFrance and EIFO in Denmark have a balance sheet total of around 3% of the GDP, which is about 10 times the current balance sheet total of Invest-NL and Invest International combined. Moreover, Dutch institutions do not form a cohesive system that can invest through the full development and scale-up chain and has the required scale and expertise to do so. This is precisely what is needed to guide Dutch technology companies through the crucial phase of demonstration (think first-of-a-kind factories), market launch and scale-up - phases in which foreign competitors are often supported by much larger public investment resources. Moreover, in this way, the Netherlands misses out on the connection with financial instruments of the European Investment Bank (EIB).

That is why it is necessary to create a National Investment Bank (NIB): a new entity without a banking licence, but under financial supervision. The bank will be a new organisation integrating Invest-NL, Invest International and newly created business units. It has one balance sheet, one governance (differentiated according to the organisation's different tasks), an integrated investment strategy and a coherent set of financial instruments. This integration allows the bank to enable blended finance: the intelligent linking of public and private funds in tailor-made solutions - especially for larger projects. The regional development corporations are crucial for connecting to regional innovation ecosystems. Connection with these parties can be secured by transferring some of their shares to the bank, or vice versa. The NIB thus becomes the central implementation vehicle to realise the investment agenda detailed in this report.

The NIB will have a clear mission: to invest in strengthening the Netherlands' earning capacity and building strategic capacity in the four domains that will determine the future prosperity and resilience of our country: digitalisation and AI, security and resilience, energy and climate technology, and life sciences and biotechnology. In this context, the institution focuses not only on businesses in these domains, but also on the infrastructure preconditions needed for them to

10-20 billion

Core capital for the National Investment Bank

function. It is precisely these investments that now fall between the cracks in the Netherlands because they are too risky or too capital-intensive for the market, but too large, too long-term or unsuitable to be financed via a departmental budget.

The NIB operates as a professional financial institution at arm's length from politics, with its own board of directors, an independent supervisory board and under the supervision of De Nederlandsche Bank and the Dutch Authority for the Financial Markets, following the example of the KfW in Germany and Bpifrance in France. While the institution has a public mission, it must realise sufficient returns to operate financially independently. That is essential for credibility towards institutional investors and international partners, for the possibility of attracting external funding and to avoid investments having to go automatically and exclusively via the state budget. Whether that is possible depends on whether the NIB is considered part of the public sector under European rules; the more autonomous and market-based it is designed, the greater the scope to use external funding effectively and avoid crowding out private investments. Public direction and mission remain safeguarded in the process.

An important role of the NIB is to organise large-scale private-public co-financing. Unlike existing institutions, the NIB will have the ability to raise its own loan capital from the market. With a core capital of around €10 billion to €20 billion, depending on the risk appetite, the investment propositions and the NIB's available expertise, scope for investment of up to €100 billion or more can thus be created.

National Agency for Groundbreaking Innovation

With the loss of new rounds of the National Growth Fund, the Netherlands lacks an instrument that provides long-term support to innovation ecosystems. This is a serious omission because consistent and predictable support is necessary to make targeted investments in our future earning capacity. Therefore, there needs to be a new instrument that fills this gap while drawing lessons from what did not work as well with the National Growth Fund. This new tool must not only ensure the continuity of ecosystem development, but also be directly linked to the strategic choices from this report. Key conditions include the fund operating at a much greater distance from politics, better coordination of investments within a single overarching strategy, and better anchoring the speed of implementation. The four domains central to this report provide a solid basis for this.

To give substance to this new instrument, a National Agency for Groundbreaking Innovation (NABI) must be set up. The Dutch innovation system is good at promoting incremental innovation, but insufficiently focused on realising technological breakthroughs that go against the status quo. There is no party that develops groundbreaking innovations and supports commercialisation, on a large scale. A NABI, along the lines of the US (Defense) Advanced Research Projects Agency (DARPA and ARPA), can break through this. More and more European countries are recognising this same gap: Germany and the UK have already set up DARPA-like agencies and France is preparing a similar institution.[47] This international movement underlines that the Netherlands can no longer do without such a vehicle.

"What might sound like science fiction elsewhere in the world at DARPA was future science.""

– Annie Jacobsen, author of *The Pentagon's Brain; An Uncensored History of DARPA*

2 billion

The NABI must become an autonomous public organisation with a multi-year budget of €1.5 to €2.0 billion and a clear mission

There must also be room in this agency for a long-term investment vehicle that does not replicate the NGF in its current form, but does endorse the same goals and implements these in a sharper and more market-oriented way. Not as a stand-alone fund, but as an integrated part within the NABI. Until the creation of the NABI, the NGF and its ongoing projects must be given maximum support to realise innovations. The creation of the NABI brings ecosystem development, mission-driven innovation and disruptive breakthroughs under one strategic umbrella for the first time, creating the necessary scale and coherence that is lacking in the current system. DARPA and ARPA in the US have shown for decades that this combination of excellence, autonomy and coordination produces significantly more disruptive breakthroughs than traditional grant models, with well-known achievements including the internet, GPS, mRNA platforms and autonomous systems.[48]

The NABI must be an autonomous public organisation, at arm's length from the government, with an independent multi-year budget of €1.5 - €2.0 billion and a clear mission: to develop groundbreaking and disruptive technological innovations within the four domains covered in this report. The establishment of such an organisation is also expected to require a specific founding law to legally secure its mandate, governance, powers and long-term budget. NABI programmes are temporary problem-driven projects, characterised by high uncertainty but with substantial opportunities for impact. There is a central role for autonomous managers of programmes and instruments to set the direction and actively help drive R&D projects. These programme managers are selected for international excellence and experience in high-tech R&D, ensuring that the NABI is led by people well acquainted with the state-of-the-art in science and industry. Each programme has a clear goal, a set timeline and multiple parallel solution paths, which must collectively lead to a working, disruptive solution that can be deployed at scale.[49, 50]

When identifying promising themes and challenges, the NABI includes insights from businesses, knowledge institutions and other societal stakeholders, while the ultimate decisions are made completely independently within the agency. This keeps the NABI both strategically positioned and embedded in relevant technological and market developments.

To ensure that the resulting solutions are actually implemented, it is essential that the government acts as a launching customer. Unlike abroad, procurement budgets in the Netherlands are still used very little for innovation.[51] To break out

Neither the political cycle nor the budgetary system sufficiently rewards investments with long payback periods.

of this trend, the creation of the NABI must be accompanied by a legal commitment to innovation-based procurement, based on a national strategy for public procurement. This legal commitment stipulates that a fixed percentage of the government-wide procurement budget must be used in an innovation-oriented way; via NABI solutions, innovation partnerships or advance market commitments.[52] Indeed, as several proposals in Chapter 4 also show, without a guaranteed first market, it is very difficult to develop risky technologies through to application. The US system, which requires federal departments to spend a minimum of 3% of their procurement budgets on innovation from SMEs, shows how effective such an incentive can be.[53] By adopting this approach, the Dutch government can structurally act as a launching customer of potentially groundbreaking innovations, with the NABI as a booster. In order to lower the threshold for public parties to act as launching customers, changes to the legal framework will also be needed. The revision of the European Procurement Directive (2026-2027) and its possible implementation must make the procurement of innovative solutions faster and easier than is now the case.

In addition, procurement processes after completion of NABI programmes must be simplified, allowing governments to accelerate procurement of technologies developed with public funding. Finally, linking NABI programmes to the regulatory sandboxes mentioned in Chapter 3 can help innovations scale up faster. This will create a direct organisational and legal link between research, development and actual application - a link often lacking in the current system.

The above elaboration makes the NABI a decisive organisation that can drive and scale up targeted groundbreaking and disruptive technology development. Thus, the NABI can contribute to strengthening the Dutch position within the four domains central to this report: digitalisation and AI, security and resilience, energy and climate technology, and life sciences and biotechnology. At the same time, the NABI will largely render superfluous the current fragmentation of policy around innovation-based procurement, including countless small 'challenge-based' programmes spread across different ministries and implementing organisations. Combining these functions in a single strategically driven agency will, for the first time, create a clear, predictable point of contact for groundbreaking innovation, with less bureaucracy and more focus.

The establishment of the NABI creates a structure complementary to the National Investment Bank: the NABI develops breakthrough technologies, the NIB enables industrialisation in the Netherlands. This will enable the Netherlands to offer funding opportunities at all TRL levels. With this combination, the Netherlands can build the critical positions needed to remain strategically relevant, advance transitions and achieve the necessary economic growth.

Conclusion and recommendations

The government is not yet adequately taking up its role in stimulating innovation and commercialisation. From strengthening innovation ecosystems to developing and scaling up groundbreaking technology: The Netherlands lacks the coherence, scale and continuity needed for this. An integrated public funding system from early innovation to industrial scale-up is essential to realise our growth ambitions and strengthen our technological positions.

1. Establish a National Investment Bank

- Integrate Invest-NL and Invest International into one powerful institution with a core capital of €10 to €20 billion. Place this bank at arm's length from politics, with professional financial governance.
- Ensure this bank works with parties in the financial market to finance the innovation and industrialisation chain. To this end, let the bank activate private capital on a large scale to cap public contributions.
- Focus in the institution's mandate on funding strategic projects and infrastructure preconditions within the four strategic domains covered in this report.

2. Set up a National Agency for Groundbreaking Innovation

- Organise the NABI as an autonomous public organisation, at arm's length from the government, with an independent multi-year budget of €1.5 - €2.0 billion, and a clear mission to realise groundbreaking innovations within the four domains covered by this report.
- As a government, act as launching customer. Lay down in a national public procurement strategy that a fixed percentage of the procurement budget will be spent on innovative solutions, including those from the NABI.

5.4. Towards decisive governance that delivers quickly

Strengthening Dutch competitiveness is not only a matter of wanting to, but also of being able to. The current design of the government falls short in this regard because it is insufficiently capable of delivering the speed needed to realise in a timely manner the preconditions and projects that are essential for structural economic growth. There is a lack of urgency to really invest in a future-proof economy because economic decline is gradual and sometimes unfolds outside of the direct field of vision. As a result, necessary reforms and choices are not made. An additional problem is that major investment tasks are fragmented across different departments and levels of government[54]. Departments at the central government in The Hague are too concerned with realising the interests of their own ministry, rather than the public interest. Public issues on which breakthroughs are needed get stranded in conflicting interests as a result. The nitrogen impasse, described in Chapter 3, is the best example of this: what is lacking is a comprehensive consideration of interests, with drastic consequences for the economy and society. The investment challenges from Chapter 4 also show that implementation is only promising if departments and local authorities work together much more closely than they do now. Moreover, our current political-administrative system disproportionately rewards short-term successes. As discussed, neither the political cycle nor the budgetary system adequately values investments with long payback periods.[55] At the moment, it is more important for the Minister of Finance to stay within the 3% budget deficit norm next year than to have money left in the NGF to invest in the future of the Netherlands.

Future prosperity must be designated a matter for top-level decision making

Addressing these problems requires a change of direction. We need an administrative structure that does justice to this urgency, combats compartmentalisation, creates support and makes and implements choices for the long term with decisiveness and speed. This starts with the prime minister: given the great importance for all Dutch people, future prosperity must be a matter for decision making at the highest level. The prime minister is ultimately politically responsible and will have to give direction on this dossier, setting the course from a clear agenda supported by the cabinet. Rather than increasing complexity, this role reduces it by temporarily pooling fragmented responsibility in a single political anchor. To prevent this from remaining just good intentions, the coalition agreement must contain a number of concrete and accountable targets, such as at least 1.5% structural economic growth and a solution for grid congestion and the nitrogen deadlock. These targets must be linked to a set of concrete interventions to be realised within the cabinet period. Besides the commitment of the Minister of Economic Affairs, these goals also require commitment from other cabinet members, thus encouraging cooperation within the cabinet. In this way, the prosperity of future generations becomes a priority for the entire cabinet. That these targets are a matter for decision making on the highest level also means that it is not the Minister of Finance, but the prime minister, who is accountable for the achievement of these targets on accountability day. This requires political courage, but is absolutely necessary.

The use of a temporary, independently positioned commissioner makes it possible to break down compartmentalisation and streamline complex decision making.

Commissioner for Future Prosperity drives decision making and implementation

To achieve quick results, no permanent new tier of government will be created, but the cabinet will be supported by a 'Commissioner for Future Prosperity'. By analogy with the role of the Delta Commissioner in making the Netherlands climate-proof and water-robust, this government commissioner is appointed for seven years by the Council of Ministers and the position is enshrined in law. The use of a temporary, independently appointed commissioner makes it possible to break down compartmentalisation and streamline complex decision making. As such, the Prosperity Commissioner creates the speed that the current system cannot deliver. Political choices on goals, priorities and resources remain entirely with the relevant ministers and the House of Representatives; the commissioner supports them by accelerating implementation and providing insight into progress.

The Prosperity Commissioner focuses on realising crucial preconditions, by making concrete proposals for these and driving their implementation. The commissioner has direct access to ministers and governing bodies and the power to request targeted information from them. This allows the commissioner to operate effectively 'between the lines' of central government departments in The Hague and local authorities. The Minister of Economic Affairs is politically responsible for the commissioner, but when interdepartmental decisions are not forthcoming, the commissioner can escalate issues to the prime minister. This creates a mechanism by which departmental silos can be broken without the commissioner stepping into the role of minister. In addition, the commissioner coordinates the realisation of large-scale investment projects of national importance identified in this advisory report. This model provides stability across successive terms of office. As such, the commissioner acts as a temporary system accelerator: once preconditions, administrative structure and interdepartmental cooperation are functioning sustainably, this role can be scaled down.

The Prosperity Commissioner is supported by a decisive and expert support unit of 20 to 40 FTEs with its own implementation budget. This unit coordinates the cooperation between different departments and levels of government to achieve the Prosperity Commissioner's goals. In doing so, the unit works closely with rapid-delivery teams to be set up within departments to remove obstacles and achieve rapid implementation. This creates a government-wide capacity to tackle fragmented dossiers, such as energy infrastructure, licensing and spatial planning. To finance the commissioner's proposals, a Future Prosperity fund will have to be set up that is appropriate in scale to the national investment challenge. This is another temporary provision specifically aimed at accelerating and deregulating implementation processes.

Break out of departmental compartmentalisation

To further improve coherence in decision making, some departmental divisions made for political reasons must be reversed, starting with a single Ministry of Economic Affairs, Trade and Energy, so that economic policy, trade policy and energy policy fall under one minister again. Bringing related policy areas together simplifies decision-making and reduces administrative complexity. In addition, in order to strengthen cooperation between relevant departments, a Ministerial Committee on Future Prosperity chaired by the prime minister will be set up. This committee is the administrative hub from which national priorities are set and decisions prepared before they go to the Council of Ministers. Given the scarcity of resources, space and implementation capacity, this hub can also achieve prioritisation of major public investments, including in the physical living environment. This ensures that proposals go ahead that contribute to necessary economic growth and the affordability of public services. The Prosperity Commissioner structurally participates in these consultations as an advisor.

The commissioner establishes an annual breakthrough programme that translates the cabinet's overarching objectives into concrete interventions, such as reducing the regulatory burden or starting projects of national importance. Where regulations or procedures pose a disproportionate obstacle, the commissioner can establish regulatory sandboxes so that necessary projects do not run aground in what is currently a slow and fragmented process. The breakthrough programme is adopted by the Council of Ministers and implemented in consultation with the ministers concerned. The cabinet provides this programme with an annual strategy, including the financial resources being made available for the measures proposed by the commissioner. The Prosperity Commissioner gives an annual update to parliament on the progress of the breakthrough programme.

In this way, a firmly entrenched structure is created in which the prime minister takes ultimate responsibility for the chosen course, the Prosperity Commissioner drives it, the Ministry of Economic Affairs supports it, the Ministerial Committee on Future Prosperity ensures coherent decision making, and accountability is provided to parliament. The core of the system thus remains clear: politics sets the goals, the commissioner helps to implement agreed goals faster and better and to make progress transparent. This reinforced administrative structure is thus not an end in itself, but a temporary instrument to reduce fragmentation, delay and administrative complexity. As soon as the government is working more simply, quickly and coherently, this structure too can be scaled down.

A National Investment Council identifies bottlenecks and opportunities in the Dutch economy

The commissioner is aware of what is going on in the Dutch economy, but is at enough of a distance from the business sector to operate autonomously so that only the national interest is promoted.[56] To this end, a National Investment Council will be set up, chaired by the commissioner and comprising directors of companies in strategic sectors, knowledge institutions, startup entrepreneurs and former top officials. To maintain momentum, there is a maximum term of office for the members of this council. The council meets twice a year and identifies bottlenecks and opportunities to realise the Prosperity Commissioner's breakthrough programme. Findings are fed directly into the Ministerial Committee on Future Prosperity so that public-private insights are given a structural place in national decision making, and, where relevant, they can also be used as independent input for the further development of the NABI and the NIB.

By embedding the importance of the future prosperity of our society in the political process across successive terms of office, we give businesses the certainty and consistency of policy they need to invest in the Netherlands.

Recent Dutch experience shows that decisive decision making can be done. The rapid scaling-up of IC capacity during COVID-19, the realisation of LNG terminals in record time, the Ukraine Task Force and Operation Beethoven show that we can operate very decisively in the Netherlands, provided we work from shared urgency and common goals, and parties are willing to move beyond their particular interests. With this administrative structure, we create the capacity to tackle structural barriers that currently remain unresolved. This would make perseverance no longer an occasional crisis response, but a permanent pillar of our economic future. By embedding the importance of the future prosperity of our society in the political process across successive terms of office, we give businesses the certainty and consistency of policy they need to invest in the Netherlands. Especially at a time when fickle policy, such as the NGF cutbacks, reign supreme, such certainty is crucial.

A streamlined, expert and agile civil service

Finally, the government itself must become more streamlined and professional in order to make this administrative structure work. Complexity in policy-making and implementation has increased sharply in recent years,[57] while major tasks remained unsolved.[58] A growing part of the civil service is concerned with internal control, reconciliation, legal analysis and accountability, instead of service provision to people and businesses. The complexity of rules and layers of oversight, and the associated excessive legalisation, puts direct pressure on the government's ability to deliver. Until this complexity is reduced, the necessary speed in decision making and implementation will also remain out of reach. Moreover, the strong emphasis on accountability promotes a risk-averse culture, whereas these times call for an entrepreneurial civil service that dares to experiment and seeks innovative solutions to achieve political objectives.[59]

By simplifying regulations, standardising processes, eliminating inefficiencies and making better use of digitalisation (as demonstrated by countries like Estonia and Singapore), the need for alignment and control naturally decreases.[60] When expertise is better utilised and teams become more stable, the government can perform better with less organisational ballast and fewer civil servants. This will create a government that is more streamlined, more agile and more predictable in working on the major challenges of our time.[61]

Moving away from our current process culture to a democracy that puts the achievement of societal goals first again is not easily done. The government must act with speed and decisiveness, and in doing so, it must dare and be able to make mistakes. An inquisitorial democracy in which politicians, administrators, businesses, regulators and the media are constantly looking for opportunities to judge each other on anything will get us nowhere. Openness, honesty, vision and action must be rewarded, not punished. The government must once again deliver. If it does not, not only our economy but also the support base for our democracy will be at stake.

Conclusion and recommendations

Achieving structural economic growth of at least 1.5% to 2.0% requires a government that works faster, simpler and more coherently. Strong political leadership, clear goals and a (temporary) structure to break out of compartmentalisation can speed up decision making and improve implementation. This will create a government that delivers on the major challenges of our time and strengthens confidence in both the economy and democracy.

1. Designate future prosperity a matter for top-level decision making

- Make the prime minister ultimately responsible for future prosperity and for achieving 1.5% to 2.0% growth. The direction on this issue must come from the prime minister, from a clear agenda supported by the cabinet.
- Therefore, have the prime minister, rather than the Minister of Finance, render account for these goals on accountability day.

2. Break out of departmental compartmentalisation

- Appoint an independent, legally entrenched Commissioner for Future Prosperity with a seven-year mandate. Provide this government commissioner with a decisive implementation unit, its own fund and good liaisons with the rapid-delivery teams within departments to accelerate stalled dossiers, preconditions and investment projects.
- Establish a ministerial committee on Future Prosperity.
- Reverse departmental divisions that were made for political reasons, starting with a single Ministry of Economic Affairs, Trade and Energy.

3. Institutionalise public-private dialogue

- Establish a National Investment Council chaired by the prime minister to put strategic bottlenecks and opportunities in the Dutch economy on the agenda.

4. Make the civil service more streamlined, more professional and more agile

- Simplify regulations and standardise processes so that less reconciliation, fewer officials and less control are needed across all layers of government.
- Promote a cultural change in which risk-taking is rewarded. Encourage the civil service to be entrepreneurial and experimental so that the government becomes more innovative in achieving political objectives.

CHAPTER 6

The roadmap to future prosperity

The Netherlands is facing choices that will determine whether we can secure our future prosperity. Structural growth does not happen of its own accord; it requires clear direction, consistent decision making and significant investments for the next decade. This chapter therefore presents a concrete timeline that brings order to what needs to happen when: choices in the first 100 days, implementation in the first year, structural recovery towards 2030 and scaling up to 2035. This creates a pathway in which policy, preconditions and investments reinforce each other.

One cabinet cannot restore confidence in the investment climate; this requires a consistent long-term course that transcends successive cabinets and makes clear that the Netherlands is ready to make the necessary choices.

The Netherlands is facing choices that will determine whether we can secure our future prosperity. Structural growth does not happen of its own accord; it requires clear direction, consistent decision making and significant investments for the next decade. This chapter therefore presents a concrete timeline that brings order to what needs to happen when: choices in the first 100 days, implementation in the first year, structural recovery towards 2030 and scaling up to 2035. This creates a pathway in which policy, preconditions and investments reinforce each other.

To mobilise the large-scale private investments needed for this, a number of preconditions need to be created: a lower regulatory burden, sufficient talent, affordable energy and a future-proof physical, digital and knowledge infrastructure. At the same time, the investment and administrative structure of the Netherlands needs to become more conducive to future prosperity so that the Netherlands can once again become a country where big investments land and companies can advance. In that context, the Netherlands needs to strengthen its strategic relevance in technological niches within four domains (digitalisation and AI, security and resilience, energy and climate technology, and life sciences and biotechnology) that are directly linked to the major societal and geopolitical transitions of our time.

This chapter brings these strands together and translates them into a roadmap with four stages: the first 100 days, the first year, the period to 2030 and the period to 2035. This phasing is essential: structural change only succeeds if the right steps are taken at the right time. First, the direction must be set, Next, implementation must begin. After that, preconditions must be structurally restored. Finally, the necessary growth can be achieved. This creates a timeframe in which policy, investments and implementation are aligned, enabling a real move towards a stable, innovative and competitive economy.

As such, this chapter constitutes a roadmap for the next decade, helping future cabinets stay the course and removing uncertainty for businesses, investors and talent (see Figure 6.1). One cabinet cannot restore confidence in the investment climate; this requires a consistent long-term course that transcends successive cabinets and makes clear that the Netherlands is ready to make the necessary choices. Only then will the confidence emerge that is needed to invest at the necessary scale in the Netherlands.

The concrete recommendations per domain and theme are detailed in Chapters 1 to 5. In this concluding chapter, we present a comprehensive agenda that brings together these priorities, provides direction along the four time horizons and enables the turnaround in investments needed to realise future prosperity. This is how we increase our strategic relevance, generate structural growth and ensure the financial sustainability of public services.

The first 100 days: making choices, setting direction and organising control

The first 100 days are decisive for steadiness on course, credibility and implementation capacity.

1. Preconditions and acceleration

- The cabinet decides on structural restoration of the four preconditions and includes the costs for this in the budget.
- The cabinet deploys central perseverance to accelerate improvements in the availability of space, licensing, energy and the regulatory burden.
- The cabinet carries out decision making on a nitrogen package with a legally tenable reduction pathway, thus ensuring room for development.
- The cabinet streamlines the frameworks for environmental plans so that they are uniformly implemented, starts preparations for a legislative change and, if necessary, an acceleration act.
- The cabinet translates the Water Framework Directive (WFD) risk assessment on water quality into a package of measures with administrative decision making.

2. Realisation of strategic projects and public-private partnerships

- The cabinet establishes the National Investment Council with the prime minister as chair.
- The ministries involved launch rapid-delivery teams and put immediately implementable projects and programmes from the report into action.
- The cabinet announces a national summit in 2026 to review progress, bottlenecks and agreements between government and the business sector.
- The cabinet launches a public-private innovation and investment agenda.
- The cabinet designs a full implementation plan to establish the National Investment Bank (NIB) and the National Agency for Groundbreaking Innovation (NABI) - including draft legislation, governance, powers and resources - within two years at the latest.

Figure 6.1 Roadmap to future prosperity

	Preconditions and acceleration	Realisation of strategic projects and public-private partnerships	Decisive governance and implementation
First 100 days Making choices, setting direction and organising control	• Structural restoration of four preconditions. • Nitrogen package with a legally tenable reduction pathway. • WFD package of measures with administrative decision making.	• National investment council established with the prime minister as chair. • Rapid-delivery teams launched. • National summit 2026 announced. • Investment and innovation agenda launched. • Implementation plan designed for NIB and NABI.	• Growth target of >1.5 - 2.0% anchored. • Legislative proposal for Commissioner for Future Prosperity submitted. • Departmental responsibilities for follow-up on recommendations assigned • Ministerial Committee for Future Prosperity established • Departmental coherence simplified
First year From direction to visible implementation	• Legislative changes and proposals in relation to nitrogen and licensing submitted • First steps taken for talent base. • Grid decisions, congestion measures and energy price incentives implemented. • National innovation ecosystem plan launched.	• National domain programmes and priority projects launched. • Investment pathways established per domain. • Investment savings account introduced. • Cooperation for (partial) European capital markets union prepared. • Legislative proposals for NIB and NABI submitted.	• Implementation Programme for Future Prosperity launched. • Progress report published. • Economic impact test introduced. • Ineffective tax schemes phased out. • Opportunities for selling off non-vital state participations inventoried.
Within 5 years Structural strengthening and scaling up	• Nitrogen framework realised. • Licensing processes standardised. • Strong talent base secured. • Grid congestion for businesses resolved. • Future-proof physical, digital, and knowledge infrastructure realised.	• Private co-financing mobilised. • Role in creation of capital markets union played for 2028. • Additional private investments realised. • Strategic projects scaled up. • Binding agreements made at 2026 summit. • Strategic domain positions realised. • NIB and NABI fully operational.	**Decisive implementation and structural growth of at least 1.5 - 2.0%**
Within 10 years Complete turnaround and sustainable anchoring	**Secured preconditions**	**Realised strategic projects and public-private partnerships**	

3. Decisive governance and implementation

- The prime minister formally takes responsibility for future prosperity and structural growth on behalf of the cabinet.
- The coalition programme includes an explicit multi-year growth target of at least 1.5% to 2.0% structural growth. The cabinet commits to a cabinet-wide and cabinet-transcending mission in which this agenda serves as the guide through to 2035.
- The growth target to at least 1.5% to 2.0% in year five will be included in the relevant budget chapters, the Budget Memorandum and anchored in the inaugural government meeting, so that accountability on this is rendered to the House of Representatives.
- If monitoring shows that realisation falls below the growth target, recovery policy is triggered.
- Within 60 days of installation, the cabinet will submit the legislative proposal for the establishment of a Commissioner for Future Prosperity with a statutory mandate of seven years.
- The Prosperity Commissioner has a dedicated implementation unit, a multi-year fund and reports to the Minister of Economic Affairs, with the possibility of escalating to the prime minister.
- During the inaugural government meeting, the cabinet assigns responsibilities per department for following up on the recommendations in areas including regulatory burden, talent, energy, infrastructure, the four strategic domains, implementation and financing.
- For each recommendation, the Commissioner sets departmental deadlines in the breakthrough programme and defines milestones.
- The cabinet sets up a ministerial committee on Future Prosperity chaired by the prime minister.
- The cabinet restores and streamlines departmental cohesion by, among other things, bringing economic affairs, trade and energy together under one ministry.
- Together with the Prosperity Commissioner, the cabinet analyses which policy areas are hampered by fragmentation and restructures these where necessary.

First year: from direction to visible implementation

The first year must show that the new system works and that the right path has been taken.

1. Preconditions and acceleration:

- The cabinet submits all the necessary legislative changes and proposals to get the country out of the nitrogen deadlock and structurally accelerate licensing for projects of national economic importance. Gold-plating of EU legislation is scrapped and the first regulatory sandboxes are introduced.
- The cabinet takes the first steps in reinforcing the quality of education, increasing national and international STEM intake, improving reskilling opportunities and revising the social security system.
- The cabinet takes priority grid-related decisions, ensures the energy price is at par with Belgium and Germany and implements additional measures to combat grid congestion, such as flexibility.
- The cabinet starts the implementation of the national plan for innovation ecosystems.

2. Realisation of strategic projects and public-private partnerships:
- The cabinet develops national programmes for each strategic domain and initiates priority projects via the rapid-delivery teams.
- The cabinet sets investment pathways for each domain via the National Investment Council.
- The cabinet introduces the Dutch investment savings account.
- The cabinet strengthens the Dutch venture capital market by increasing scale, professionalism and diversity.
- The cabinet prepares cooperation with a view to a (partial) European capital markets union.
- The cabinet identifies and operationalises opportunities for early co-financing and the government more often acts as a launching customer.
- The cabinet designs the administrative and legal structure of the NIB and the NABI, submits the necessary legislative proposals and starts the phased integration of relevant institutions.

3. Decisive governance and implementation:
- The Prosperity Commissioner launches the Breakthrough Programme for Future Prosperity and forms programme teams for regulatory burden, talent, energy, infrastructure, finance and strategic domains.
- The Prosperity Commissioner publishes an annual progress report and actively steers the attainment of milestones.
- The cabinet introduces the long-term economic impact test, in which major policy proposals are tested and prioritised by default for their economic effects in the medium term.
- The cabinet starts phasing out ineffective tax schemes in favour of measures that contribute positively to structural growth of 1.5% to 2.0%.
- The cabinet takes stock of the possibilities of selling off non-vital state participations with a view to non-consumer expenditure.

Within five years: structural strengthening and scaling up

In this phase, the preconditions are structurally restored and the investment engine gets up to speed.

1. Preconditions and acceleration:
- The Netherlands has standardised licensing processes in place with maximum objection periods.
- The Netherlands has a nitrogen framework that is both legally tenable and allows room for the necessary economic growth.
- The Netherlands has a strong talent base with sufficient STEM supply and effective reskilling.
- The Netherlands has increased energy security and flexibility. Grid congestion for businesses has been resolved.
- The Netherlands has a future-proof physical, digital and knowledge infrastructure as a strategic basic facility.

2. Realisation of strategic projects and public-private partnerships:
- The NIB is fully operational and finances the innovation and industrialisation chain from its mandate.
- The NABI develops breakthrough technologies and acts as a launching customer in cooperation with the government.
- The Netherlands mobilises substantial private co-financing via the investment savings account.
- The Netherlands has played a leading role in the creation of the capital markets union in 2028.
- The Netherlands realises most of the anticipated €151 billion to €187 billion in additional private investments.
- Strategic projects from this report and others have been scaled up and funded on a multi-year basis.
- The national summit took place in 2026 and resulted in binding agreements on preconditions and strategic investments, in order to achieve structural economic growth of at least 1.5% to 2.0%.
- The Netherlands has strategic positions in four domains. These are visible in increased production capacity in the four domains, an R&D intensity of at least 3% of GDP, and more successful spin-offs.

3. Decisive governance and implementation:
- The Netherlands achieves at least 1.5% to 2.0% structural economic growth within five years.
- The NIB and the NABI are both fully operational.

Within ten years: complete turnaround and sustainable anchoring

By 2035 at the latest, the new economic structure must be mature.

1. Preconditions and acceleration:
- The Netherlands has a fast and predictable licensing system, a competitive energy system, a future-proof economic infrastructure and a strong and agile talent base.

2. Realisation of strategic projects and public-private partnerships:
- The Netherlands has mature value chains within the four strategic areas.
- Dutch clusters are strong and relevant links in European and global value chains.
- The Netherlands has a stable and more attractive investment climate.

3. Decisive governance and implementation:
- The Netherlands continues to grow structurally by at least 1.5% to 2.0%.
- The NIB and NABI are structural pillars of the national investment and innovation policy.
- The Netherlands is at the forefront of a European capital markets and investment union.
- The Netherlands secures the financial sustainability of public services through strong earning capacity.

Concluding remarks

The Netherlands still has an exceptionally strong starting position: a well-educated workforce, an open economy, a unique knowledge base and a solid financial position that allows us to invest in our future. The difficult choices that this report calls for are not a constraint but an opportunity. If we provide stability and consistency, put the preconditions in place and invest on course, the Netherlands can once again become one of the most competitive and innovative economies in the world. The roadmap outlined in this report shows that this is not an abstract ideal, but a realistic path. Everything needed is at hand. The question that remains is whether we want it, and whether our political leaders have the courage to choose the necessary interventions and reforms to restore structural growth, strategic relevance and confidence in the government.

If we choose to do so, we can not only guide the great transitions of our time, but also create new opportunities for businesses, households, our international position and the generations to come. We owe it to our future generations not to leave tomorrow's prosperity to chance, but to build it ourselves: purposefully, coherently and with our sights set on the long term. If we do what it takes, we can leave future generations a stronger, more resilient and opportunity-rich Netherlands.

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Outgoing Minister for Economic Affairs Vincent Karremans asked me last summer on behalf of the cabinet if I would issue an advisory report on the investment climate and future earning capacity of the Netherlands. I thought carefully about that question at the time. After all, answering such a fundamental question is a great responsibility. In the past, as CEO of ASML, I had expressed concern about the complacency I was sensing too much in Europe and in our own wonderful country. Too much of value seemed it was being taken for granted, such as the right to prosperity in the future, without a willingness to do our best for that.

At the end of August, I said 'yes' with conviction to this important request from the cabinet. I was and am worried about an economy weakening in circumstances that precisely call for strengthening, and about the lack of political decisiveness and cooperation to turn this tide. That is why I do not want to be someone shouting on the sidelines. Also and mainly because I am convinced that we have a resilient society and can do much better together.

The report you hold in your hands is the result of over three months of hard work with a motivated and knowledgeable team that supported me. It is also the result of more than a thousand people I spoke to at more than 30 roundtables and in other discussions on all relevant topics and who contributed to the report. I am additionally impressed by the 51 project and investment proposals I received from a multitude of collaborating parties for my report. These proposals show that the Netherlands is capable of remaining a world-class player and can help strengthen Europe's relevance in the world.

I am very grateful to the members of the sounding board group for their critical eye, sharp questions, finessing and steering towards the right emphases. I thank everyone from the bottom of my heart who contributed and participated enthusiastically and expertly in this important report. The Netherlands has a prosperous future at its fingertips. Let's get down to work together.

Peter Wennink

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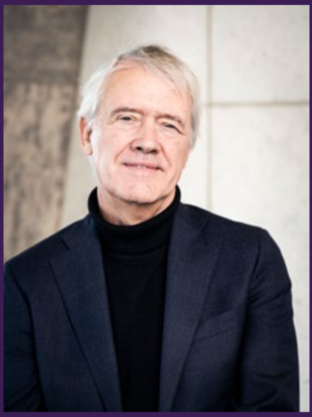

Peter Wennink (1957) served as President and CEO of chip machine manufacturer ASML from 2013 to April 2024. His current positions include Chair of the Supervisory Board of TU Eindhoven, Chair of the Supervisory Board of Heineken NV and Vice-Chair of the National Growth Fund Advisory Committee.

In summer 2025, the Schoof cabinet asked him to issue an independent advisory report on the investment climate and future earning capacity of the Netherlands. In this report, Peter Wennink outlines the roadmap to future prosperity, to a strong Netherlands in a relevant Europe. The advice in this report is based on his many years of international experience in high-tech business, the common threads from the many interviews he organised for this report and the inspiring project and investment proposals he received.

Veldhoven, December 2025

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