Smart Specilisation Strategy

The art of combination and cooperation

Date

september 2013

RIS3 Zuid
Research and Innovation Strategy for Smart Specialisation for Zuid-Nederland, the region compromising Noord-Brabant, Limburg and Zeeland (the South Netherlands)

Provincie Zeeland

Provincie Noord-Brabant

provincie limburg

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1 Introduction

The region of Zuid-Nederland (South Netherlands: which comprises Noord-Brabant, Limburg and Zeeland) is unique in that it accommodates an innovative, knowledge-based, dynamic economy and, furthermore, provides a good living environment. The region has a broad industrial base, research capacity and a matchless network manufacturers and designers. This network comprises small and medium-sized enterprises (SMEs), including startups, and research, knowledge and educational institutions. Zuid-Nederland is therefore in a position to be able to make a substantial contribution to the realisation of European objectives.

A smart specialisation strategy will shed light on the power of development of the region's economy and put it into perspective. The international top clusters: High-Tech Systems and Materials (HTSM), Chemistry and Agriculture & Food are extremely important to Zuid-Nederland. Innovative capacity is the connecting thread running through Life Sciences & Health, smart Logistics and the application of smart technologies in the fields of the Biobased Economy and Maintenance. These are clusters of national importance with international potential. By strengthening and linking them, and seeking synergy and what we call 'cross-overs', we will be enhancing our future competitiveness on the international market.

Global players, multinationals and SMEs with strong export positions are established here. These companies provide significant employment and make a large contribution to the region's R&D efforts, exports and added value. The area is an important link between the ports of Antwerp and Rotterdam and the knowledge institutes and production sites in the adjoining regions of Flanders (Belgium) and North Rhine-Westphalia (Germany). In a word, it has a strategic location with regard to the important economic core areas in the Netherlands, Belgium and Germany and the European hinterland.

Innovative capacity is also linked to a high 'quality of life', in the broader sense, in the region. The quality of life entails factors that contribute to the business climate, such as sports and cultural facilities in the cities, the relationship between urban and rural areas, the leisure economy (tourism and recreation) and the natural qualities of the region (water, landscape and nature conservation areas).

Regional development strategies, which have been realised in close cooperation between industry, knowledge institutes and government (provinces, regions and cities), examine how to increase the aforementioned innovative capacity and exploit the potential. These strategies are extremely valuable because, in the context of the use of funds for the period 2014-2020, the European Union is making a 'smart specialisation strategy (RIS3)' a condition of the use of funds from the European Regional Development Fund (ERDF). Zuid-Nederland has started drawing up a step-by-step plan on which to base its definitive RIS3. The plan comprises the following steps:

1 Becoming familiar with the RIS3 philosophy
2 Determining the starting position and materials
3 Laying down the strategic pillars
4 RIS3 assessment, preliminary test
5 Detailing, supplementing and updating where necessary
6 Updating the quantitative figures
7 Compiling the strategic RIS3 pillars

8 Developing a monitoring system
9 A possible peer review/expert review of the RIS3 Operational Programme Zuid-Nederland (OP-Zuid)
10 Adopting the RIS3 for OP-Zuid

It is important that, instead of starting a new strategic planning process, we capitalise on the strategic networks and strategies that are already available and that have been drawn up in accordance with the RIS3 philosophy. We will therefore be capitalising on the proven capacity of strategic planning and its implementation. And people will make the difference here: enterprising, talented and committed people with passion, ambition and drive. They jointly form a professional community which, as a result of the scale on which it works, is manageable and in which cooperation goes without saying. The power of this community is that it has the competences and skills to translate innovative solutions into products and services with a high added value. It is a community that understands the art of combination and cooperation. In short, it is a community that has the capacity to design, to engineer (multidisciplinary and interdisciplinary) and to manufacture products with added value and to market them successfully. Time and again.

2 Process

Instead of starting a new strategic planning process for the drawing up of the RIS3, we will therefore be building and capitalising on the deep-rooted, time-tested tradition of triple helix cooperation and the resulting strategies, strategic networks and implementation programmes. This process entails the collaboration of companies, knowledge and research institutes, regions and cities. It will be a process that also clearly takes into account the scale of the region: large enough for focus, critical mass and cohesion but open and diversification-oriented at the same time.

Most of the programmes on which the RIS3 will be based have a time horizon up to 2020.
The strategic pillars for the RIS3 Zuid-Nederland are:

- the Brainport 2020 strategy;
- the Strategic Board Zuidwest-Nederland Agenda;
- provincial economic agendas and programmes;
- the implementation programmes of the triple helix organisations in the southern sub regions of the Netherlands;
- roadmaps and innovation contracts of the relevant top sectors;
- various studies and benchmark reports.

These strategic pillars will form an integral part of the RIS3. The aforementioned strategies, policy and implementation programmes were realised by means of a bottom-up process of 'entrepreneurial discovery'. The available strategies have a high degree of complementarity and jointly cover the entire region of Zuid-Nederland.

Hundreds of people and organisations (entrepreneurs and representatives of Original Equipment Manufacturers [OEMs], SMEs, knowledge institutes and authorities) have been involved in the realisation of these strategies and implementation programmes in recent years. The strategies and programmes are further covered and supported in terms of policy by provincial economic development agendas. They are the result of a process that goes back more than ten years and that has been developing continually, in terms of both scope and content.

The following triple helix network organisations are active at the subregional level: Strategic Board Zuidwest-Nederland, Midpoint Brabant, 5-Sterrenregio Noordoost Brabant, Stichting Brainport and Brainport Development, Commissie Brainport 2020, Greenport Venlo, Limburg Economic Development and Keyport 2020. The regional development corporations LIOF, BOM, REWIN and Impuls Zeeland are also active at the sub regional level.

There is, moreover, complementarity with national policy. Zuid-Nederland's RIS3 design caters to the Netherlands' top sector policy. The top sectors and clusters that are so important to the Dutch economy are facilitated by improving the ecosystem of a knowledge-intensive, internationally innovative and sustainable top economic region through focus and cooperation.

The following parties are involved in the development of an RIS3 for Zuid-Nederland:

- the three provinces in Zuid-Nederland;
- the management authority (MA) for the current OP-Zuid and planner for the coming OP;
- the triple helix network organisations in de subregions of Zuid-Nederland;

The draft RIS3 has been submitted to a reference group of companies and knowledge institutes in Zuid-Nederland. During the drawing up of the RIS3, consultation also took place with the nine top sectors and the secretariats of the top teams: HTSM, Chemistry, Agriculture & Food, Logistics, Life Sciences & Health and Horticulture and Propagating Materials.
A working group, comprising representatives of the triple helix network organisations, the three provinces and the MA for the OP-Zuid, started work on the RIS3 for Zuid-Nederland in mid-2012. Drawing up the RIS3 took more than ten work sessions and involved continual feedback with those represented to ensure alignment and support. The RIS3 is built, in a logical manner, on commitment to the underlying strategies and cooperation between companies, knowledge institutes and government.

Besides further developing existing and a number of new top clusters and enhancing the innovation ecosystem, the strategy of the region is to diversify on the basis of existing strengths. This will be realised by using a set of partnerships that will exploit and enlarge Zuid-Nederland's earning capacity for the Dutch economy. The target will be to strengthen the region's position in existing markets and to seek new, sustainable markets, of which there are plenty. The region is known for finding solutions to problems experienced all over the world. Society, as a whole, benefits from these solutions and the region, and the Netherlands, make money accordingly.

3 Regional context and assets

3.1 Innovation and export hotspot of the Netherlands

Zuid-Nederland is the Dutch hotspot when it comes to innovation. More than 40% of Dutch R&D investments (largely private expenditure) are made in Zuid-Nederland and six of the ten Dutch global R&D players are located in Zuid-Nederland (ASML [1], PHILIPS [2], DSM [5], NXP [6], OCÉ [8] and DAF [10]). The High-tech, Chemistry and Agriculture & Food clusters are particularly important for Zuid-Nederland. The definitions of the top sectors named in this document correspond with the definitions used in the central government's top sector policy, with the exception of Agro & Food (Agriculture & Food). For the purposes of this document, the term 'Agriculture & Food' is used for the sectors described by the central government as 'Agro & Food' and 'Tuinbouw & Uitgangsmaterialen (Horticulture & Propagating Materials)'.

Around 68% of private R&D expenditure in the Netherlands is spent on these three sectors (High-tech, Chemistry and Agriculture & Food) and they jointly account for almost half of Dutch exports; that is, they form the motor of economic growth. These sectors are strongly represented in Zuid-Nederland, provide a considerable number of jobs and contribute greatly to R&D efforts, exports and added value. Logistics and Life Sciences & Health are also relatively strongly represented in the region. The location of the region means that it is an important link between the ports of Rotterdam and Antwerp and the European hinterland. If we look at Zuid-Nederland's innovation share and the presence of top sectors in this region, the following picture emerges.

Share of Dutch innovation that takes place in Zuid-Nederland

2010	R&D expenditure * € mln	Innovation expenditure * € mln	Outsourced research * € mln	Cooperation in innovation (national)	Cooperation in innovation (international)
The Netherlands	7,087	13,119	1,789	5,670	2,082
Zuid-Nederland	2,893	4,913	612	1,493	602
Zuid-Nederland's share in NL	41%	37%	34%	26%	29%

Source: Central Bureau of Statistics Netherlands (CBS), Community Innovation Survey 2010

Share of Dutch exports, added value and productivity index in the top Dutch sectors realised by Zuid-Nederland

2012	Agriculture & Food	HTSM	Chemistry	Logistics	Life Sciences & Health
Share of Dutch exports	24%	24%	43%	17%	-
Share of added value	29%	27%	47%	22%	-
Productivity index (NL=1)	1.15	1.02	1.25	1.00	-

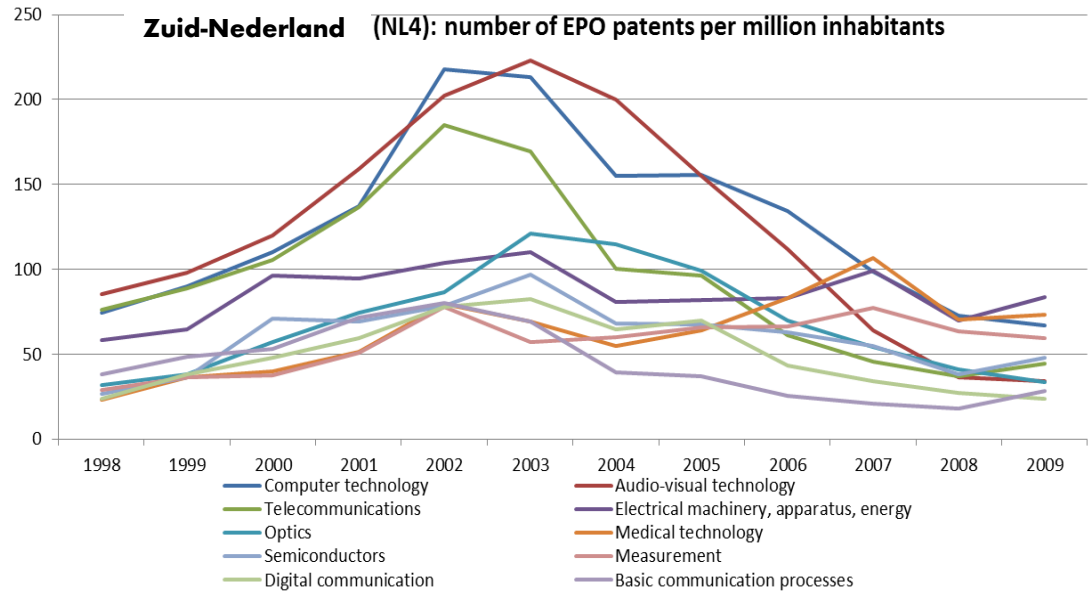
Source: EIM Small Business Research and Consultancy (EIM), via entrepreneurship.nl, Top sector classification drawn up by Brainport Development

Zuid-Nederland's relative share in top sectors

	Companies	Volume of labour	Production value	Added value	Expenditure R&D	Innovation expenditure
Chemistry	35%	37%	32%	38%	-	-
HTSM	26%	29%	35%	31%	56%*	48%*
LS&H**	26%	44%	55%	61%*	-	-
Logistics	25%	24%	21%*	21%*	-	-
Agriculture & Food	-	28%	27%	21%*	22%*	24%*

Source: CBS baseline measurement of top sectors
*: data not available for Zeeland **Life Sciences & Health

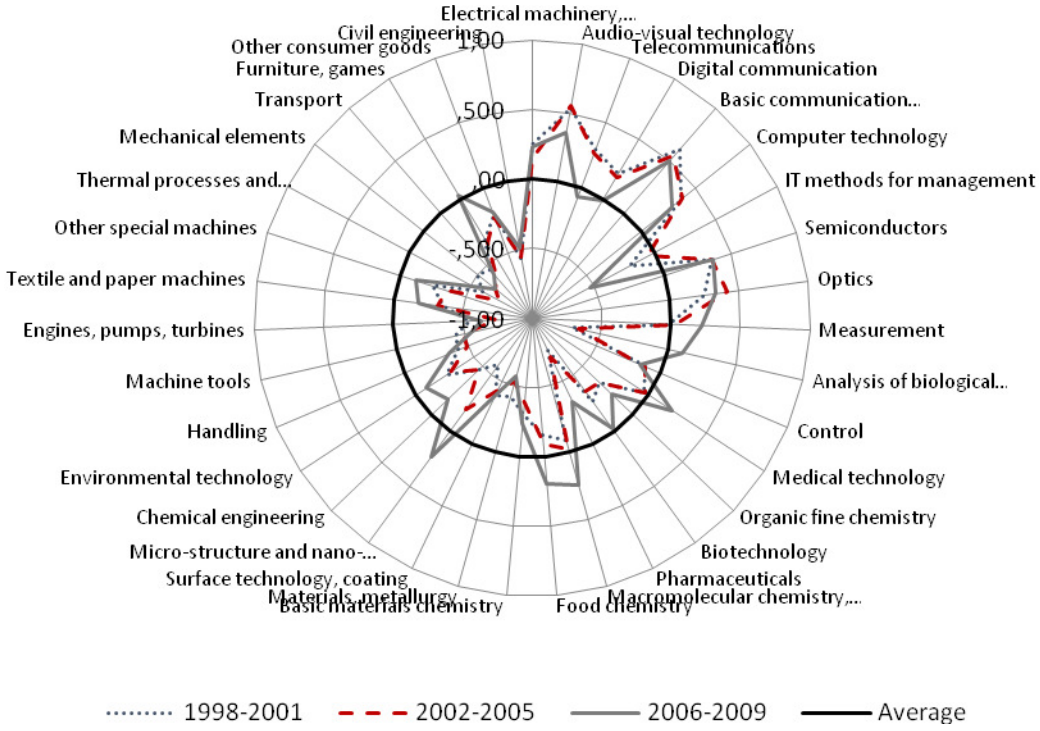
The degree of specialisation in Zuid-Nederland is considerable, both in terms of academic publications and in economic orientation. A great deal of intellectual property is also developed in this region, as shown by the recently published Draft synthesis report on innovation driven-growth in regions: the role of smart specialisation, by the Organisation for Economic Cooperation and Development (OECD)'s Working Party on Innovation and Technology Policy (TIP) December 2012. The patent output is, moreover, relatively high in comparison with other countries in Europe.
Patent output: Patents registered with the European Patent Office (EPO) per million residents for the different technology domains.



Source: Appendix of the Draft synthesis report on innovation driven-growth in regions: the role of smart specialisation, OECD, 2012

And these patents (that is, patents registered with EPO) are also highly specialised, having been classified in 35 domains according to the Fraunhofer classification. A striking point is that, in the course of time, the portfolio of specialisations has widened, indicating enhancement in a number of areas of technology and application.

Technical specialisation based on patent indicators (RTAN-EPO)



Source: Appendix of the Draft synthesis report on innovation driven-growth in regions: the role of smart specialisation, OECD, 2012

In addition to specialisation, organisation also forms an important aspect. This is expressed in the various strong triple helix cooperative organisational structures that have been recognised in an international comparison carried out by the OECD.
"The R&D and innovation governance model explored by the Brainport Eindhoven Region has unique features, characterized by public-private partnerships (e.g. Holst Centre), strong involvement of knowledge institutes in close proximity, open innovation (e.g. the former Philips, nowadays High Tech Campus Eindhoven), multidisciplinary and cross-overs between technology domains, low barriers and high trust. The role of government in the triple helix is relatively modest, yet important, as a funder of public R&D expenditure, public infrastructure and as a stimulator and co-ordinator."
Source: Draft synthesis report on innovation driven-growth in regions: the role of smart specialisation, OECD, 2012

3.2 Strong knowledge institutes

Companies and knowledge institutes are organised in clusters and networks. Universities are well embedded. Their strategic research programmes perform services for the region's business sector, among other things. They focus on the following themes:

- Eindhoven University of Technology (TU/e): Health, Energy and Smart Mobility
- Maastricht University (UM): Quality of Life, Learning and Innovation, Europe and the Globalising world
- Tilburg University (UvT): Social Innovation

This focus on the business sector applies to both the educational and research expenditures of the universities. According to the 'U-I index of top 300 EU research universities of 2011' drawn up by the Centre for Science and Technology Studies (CWTS), the UM and TU/e have a high score and

ranking on cooperation with the business sector across their entire research portfolio, with a top-50 and a top-10 position respectively. Scientific institutes such as the Dutch Institute for Advanced Logistics (Dinalog) and the Dutch Institute World Class Maintenance (DI-WCM) maintain close ties with universities in the Netherlands and abroad.

Many of the cooperative structures between universities and the business sector are regionally embedded. This is expressed in various ways, including in the fact that two Knowledge and Innovation Communities (KICs) of the European Institute of Innovation and Technology [EIT] are located in the region. The EIT's objective is to enhance economic growth and competitiveness by increasing innovative capacity, which it accomplishes by means of the aforementioned KICs. In KICs, higher educational and research institutes and the business sector organise themselves around a theme that is highly relevant or essential for society. Co-locations of the KIC Inno Energy and KIC ICT Labs are located in Zuid-Nederland.

The universities of applied sciences and Regional Training Centres (ROCs) play a supporting role in the field of education and, via Centres of Expertise and Centra voor Innovatief Vakmanschap (Centres for Innovative Craftsmanship) in particular, they create a direct link with the labour market needs of the top economic sectors that are relevant for the region.

3.3 The role of campuses

Campuses play a major role in the innovation ecosystem:

- as actual locations with good possibilities and facilities for establishing businesses;
- with the focus on R&D and knowledge-intensive activities;
- with the presence of manifest knowledge carriers
- and as an environment for active open innovation.

In 2012, on the instructions of the Ministry of Economic Affairs, Buck Consultants International made an inventory and performed an analysis of Dutch campuses. On the basis of the aforementioned criteria, Zuid-Nederland has nine campuses. Meanwhile, The Greenport Campus Venlo and Kenniswerf Zeeland can now be added also to these nine.

Source: Inventarisatie en analyse campussen 2012, Buck Consultants International

3.4 National and international recognition of the cooperation model

Figures are important but numerous initiatives in Zuid-Nederland in the fields of the knowledge economy and innovation and, in particular, their cooperative aspects, have also been recognised nationally and internationally. Some of the acknowledgements received by organisations in Zuid-Nederland are listed below:

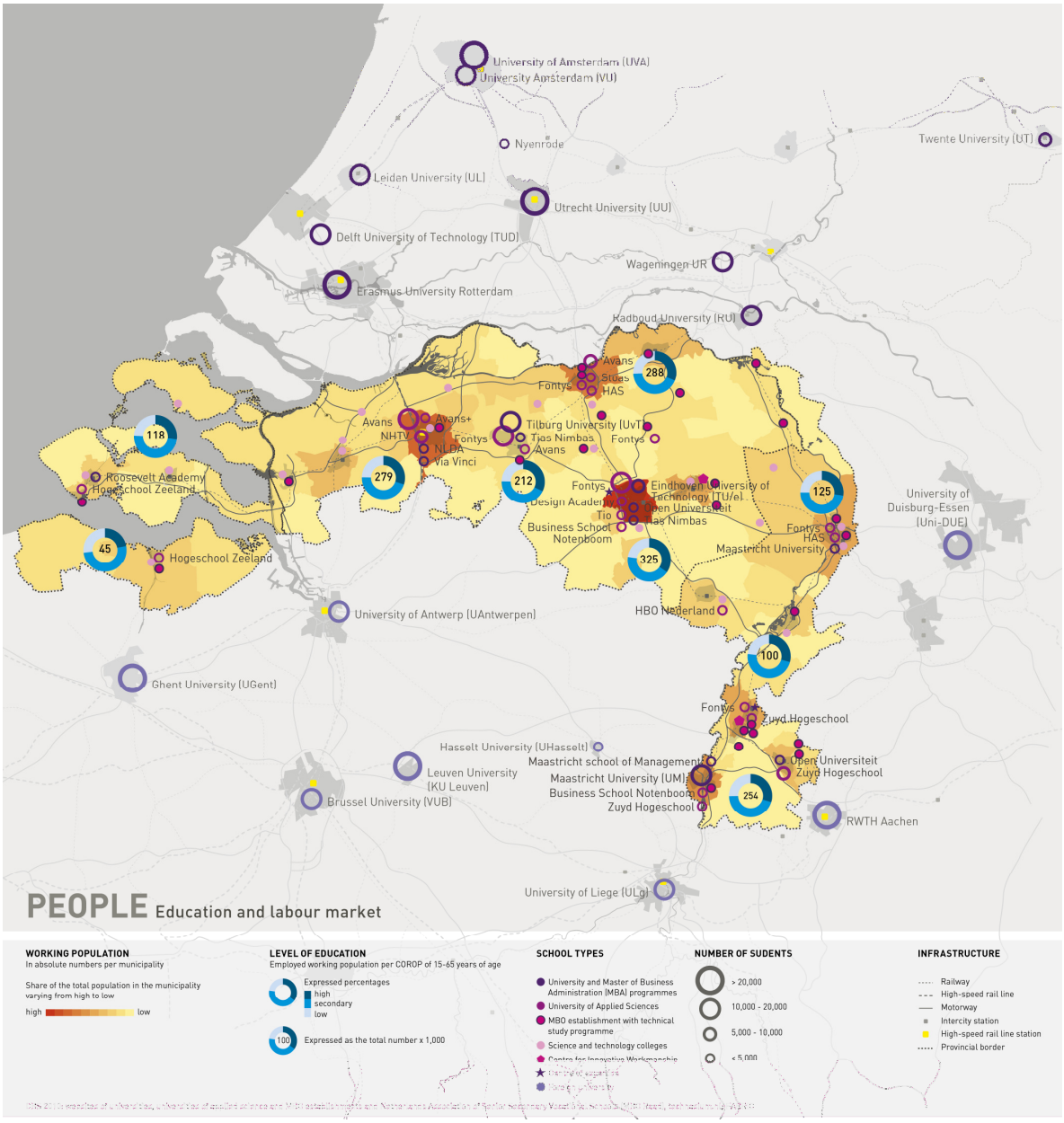
- ICF award Intelligent Community of the year 2011, 2011;
- Eurocities award for cooperation, 2010;
- Biobased Delta, Copenhagen 2012;
- iMobility Award 2012, Netherlands Organization for Applied Scientific Research (TNO)/ Dutch Integrated Testsite for Cooperative Mobility (DITCM);
- Piet Heyn Challenger Award, Brainport Industries, 2012;
- Venlo-Venray Hotspot Logistiek, 2010 and 2011;
- Region West-Brabant Hotspot Logistiek, 2012.

3.5 A picture of the ecosystem

The following maps show the regional assets of Zuid-Nederland:

- educational establishments, labour market according to size and level of education;
- technology:
  - Public research infrastructure: employment, campuses, public R&D institutes, universities and KIC co-locations;
  - Private research infrastructure: R&D wage costs, cooperation in innovation, private R&D institutes and campuses.

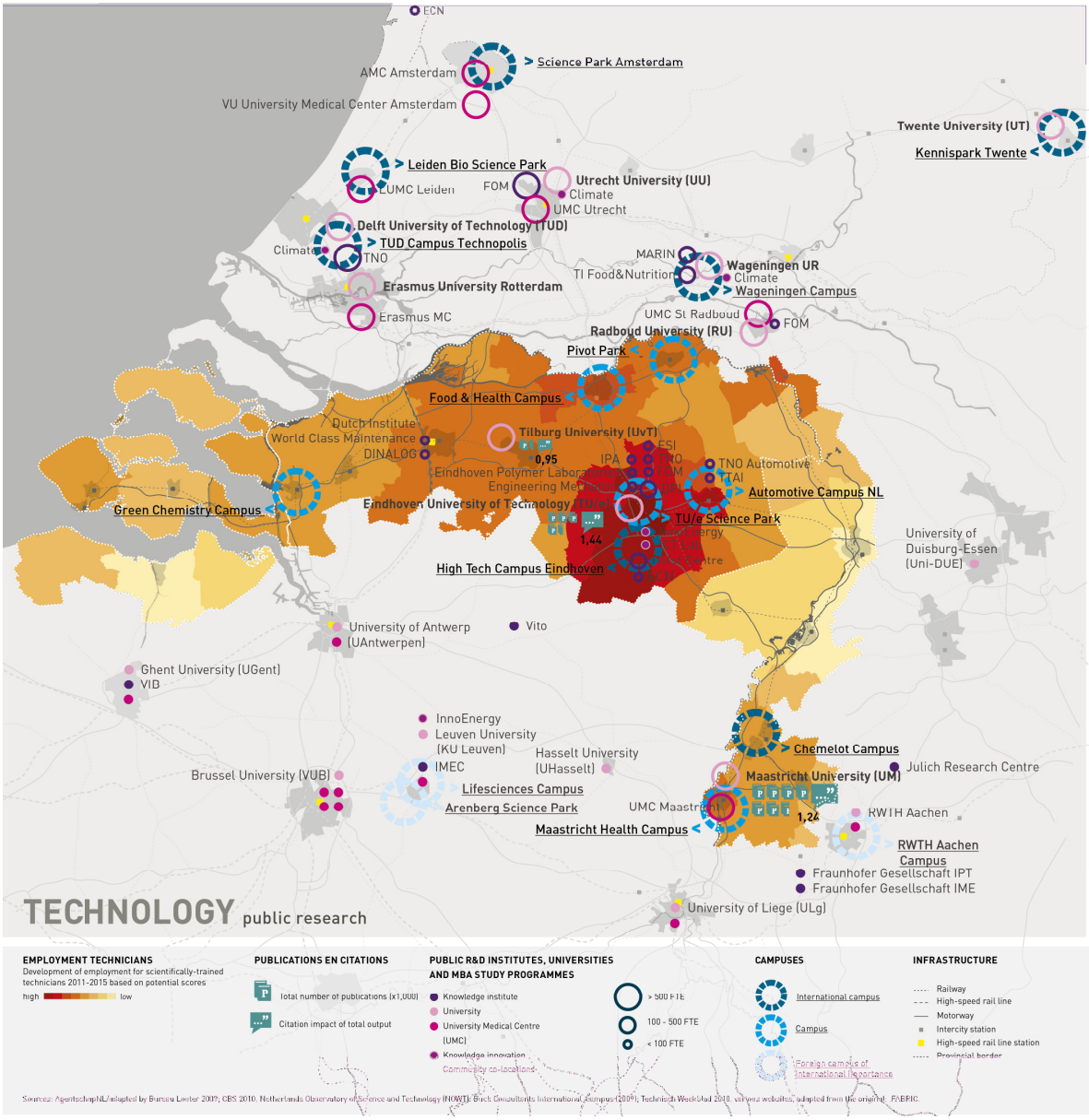
- business:
  - employment in general and in 5 clusters*;
    - Agriculture & Food
      *: The definitions of the top sectors named in this document correspond with the definitions used in the central government's top sector policy, with the exception of Agro & Food (Agriculture & Food). For the purposes of this document, the term 'Agriculture & Food' is used for the sectors described by the central government as 'Agro & Food' and 'Tuinbouw & Uitgangsmaterialen (Horticulture & Propagating Materials)'.
    - HTSM
    - Chemistry
    - Logistics
    - Life Sciences & Health
  - largest companies in terms of full-time equivalents (FTE) in the top sectors;
  - net start-ups in high tech;
- Cross-border relationships (strategic cooperation, networks and projects);
- Networks, accessibility of relevant destinations for international cooperation via:
  - Regional airports;
  - HSL(high-speed rail line) connections.



This map shows the educational situation and labour market in Zuid-Nederland. It comprises the following indicators:

- Background: size of working population (age 20-65 years) in absolute numbers per municipality. This shows where the working population are concentrated.
- Centres for Innovative Workmanship (senior secondary vocational education, MBO) and Centres of Expertise (higher professional education, HBO) in Zuid-Nederland. Entrepreneurs, scientists, lecturers and students work together at these centres, thus improving the fit between vocational and professional education and the labour market.
- Employed working population at the Coordination Commission Regional Research Programme (COROP) level, in absolute numbers (in circle) and according to level of education (by means of coloured circles). These circles supplement the information provided by the background and give a more quantitative picture of the size and level of education of the working population.

- Educational institutions varying from science and technology colleges to establishments offering technical MBO, HBO and university degree programmes (WO). The names of the institutes have only been given for HBO and WO levels; the numbers of students have also been incorporated in the sizes of the circles. This gives a complete picture of the educational infrastructure in Zuid-Nederland.

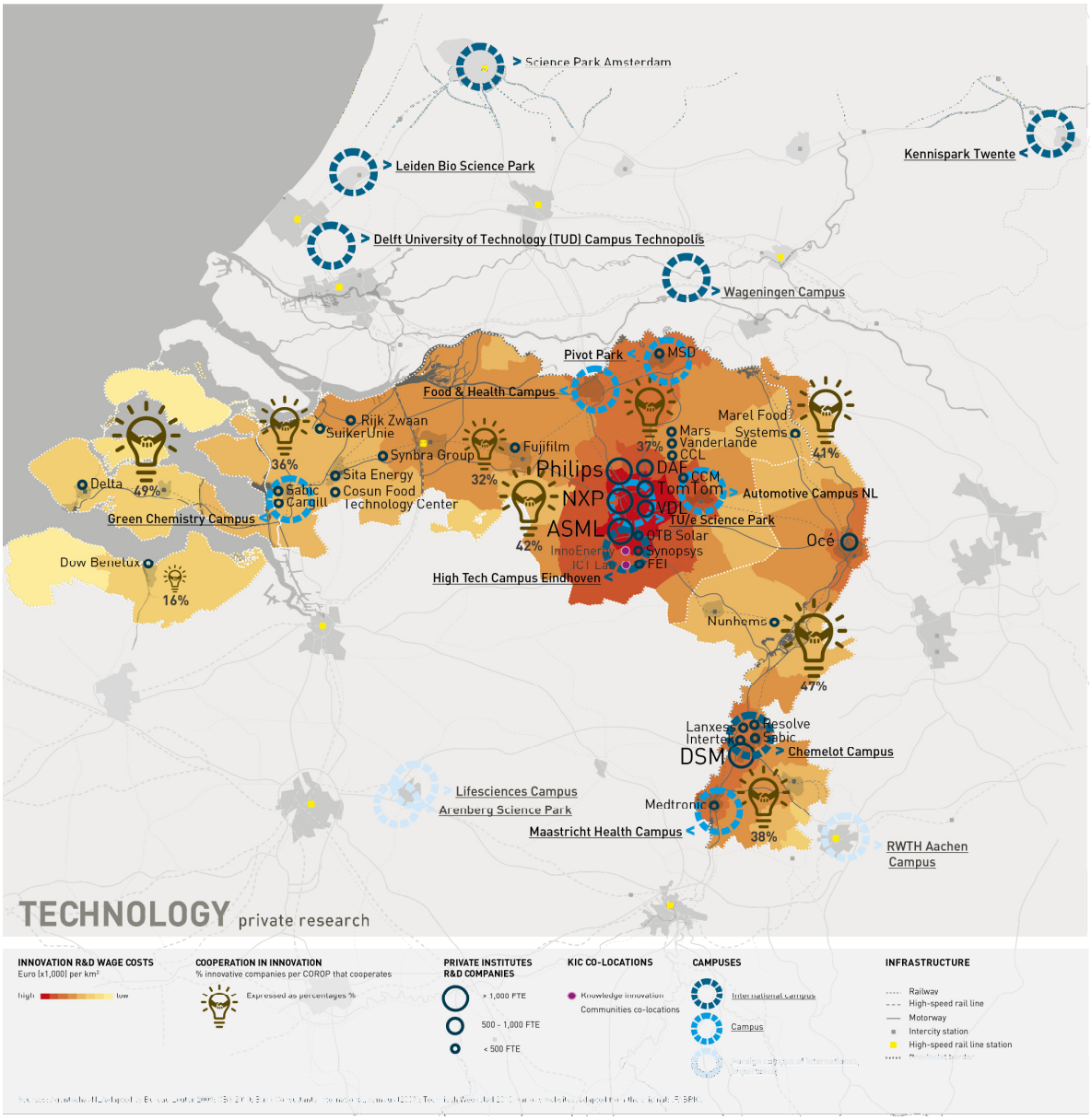


For the sake of clarity, the situation with regard to technology is illustrated on two maps (public and private). This map shows the public research infrastructure in Zuid-Nederland and comprises the following indicators:

- Background: employment for scientifically-trained technicians 2011-2015 (report by Bureau Louter).
- Campuses: a distinction has been made between national campuses and international campuses. Important campuses in the surrounding countries have also been included. Campuses have been included on the basis of objective criteria drawn up by Buck Consultants International. These criteria are as follows: An actual location with good possibilities and facilities for establishing businesses that focuses on R&D and/or knowledge-intensive activities, the presence of manifest knowledge carriers and an open innovation environment. Mature campuses have been included as international campuses and campuses in the growth and startup phases, as national campuses. Campuses are important focal points for R&D and

cooperation. Because campuses are the links between public and private research, they have been included in both the private and public technology maps.

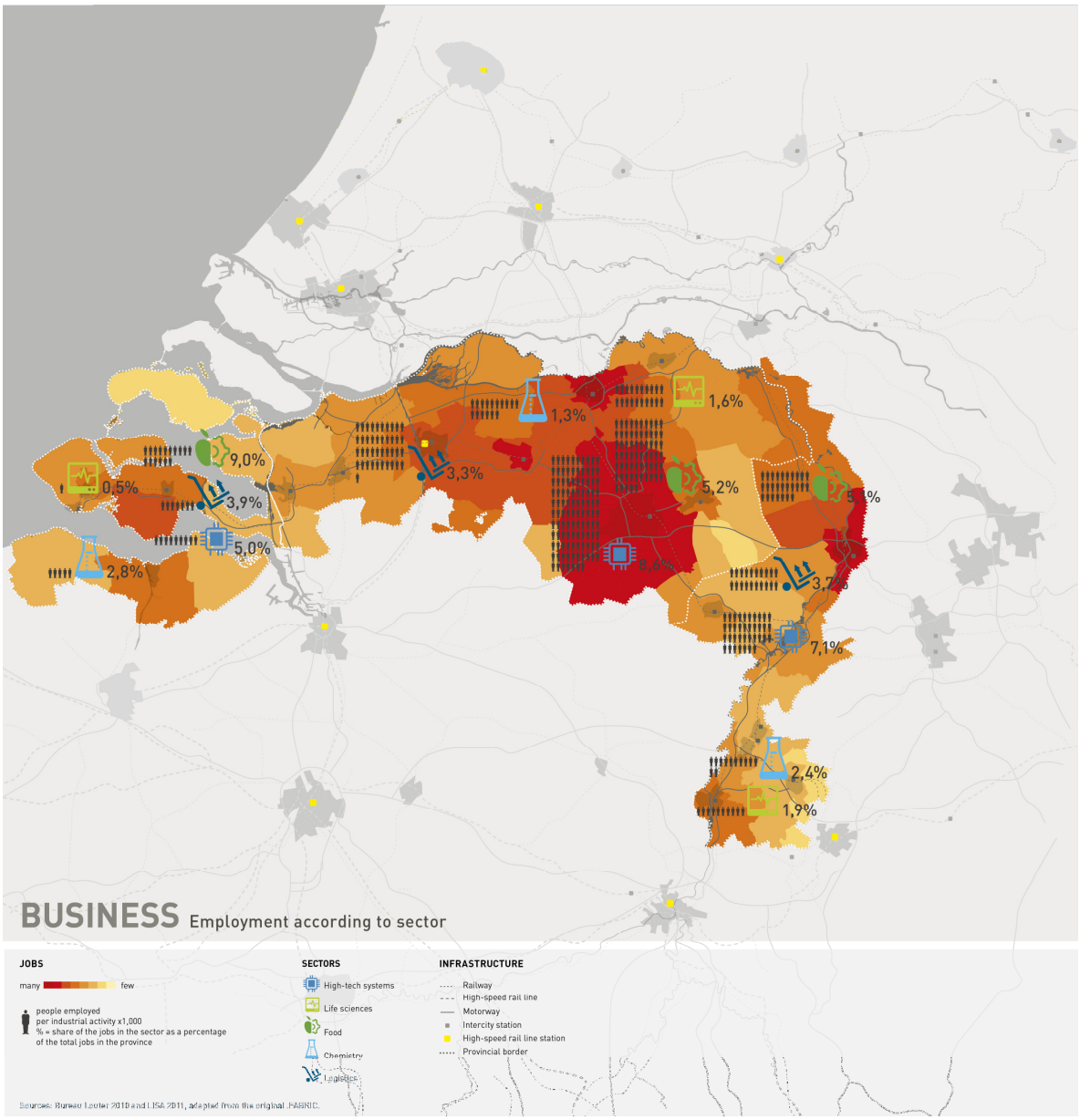
- Public R&D institutes: the knowledge institutes in the Technisch Weekblad Index, universities and university medical centres.
- The number of publications and citation impact scores of the three universities in Zuid-Nederland are also given (source: NOWT report). This gives an idea of the 'power' of the universities.
- Co-locations of the EIT's KICs. The KICs combine the forces of European companies and educational and research institutes that excel in the field of addressing a societal challenge.



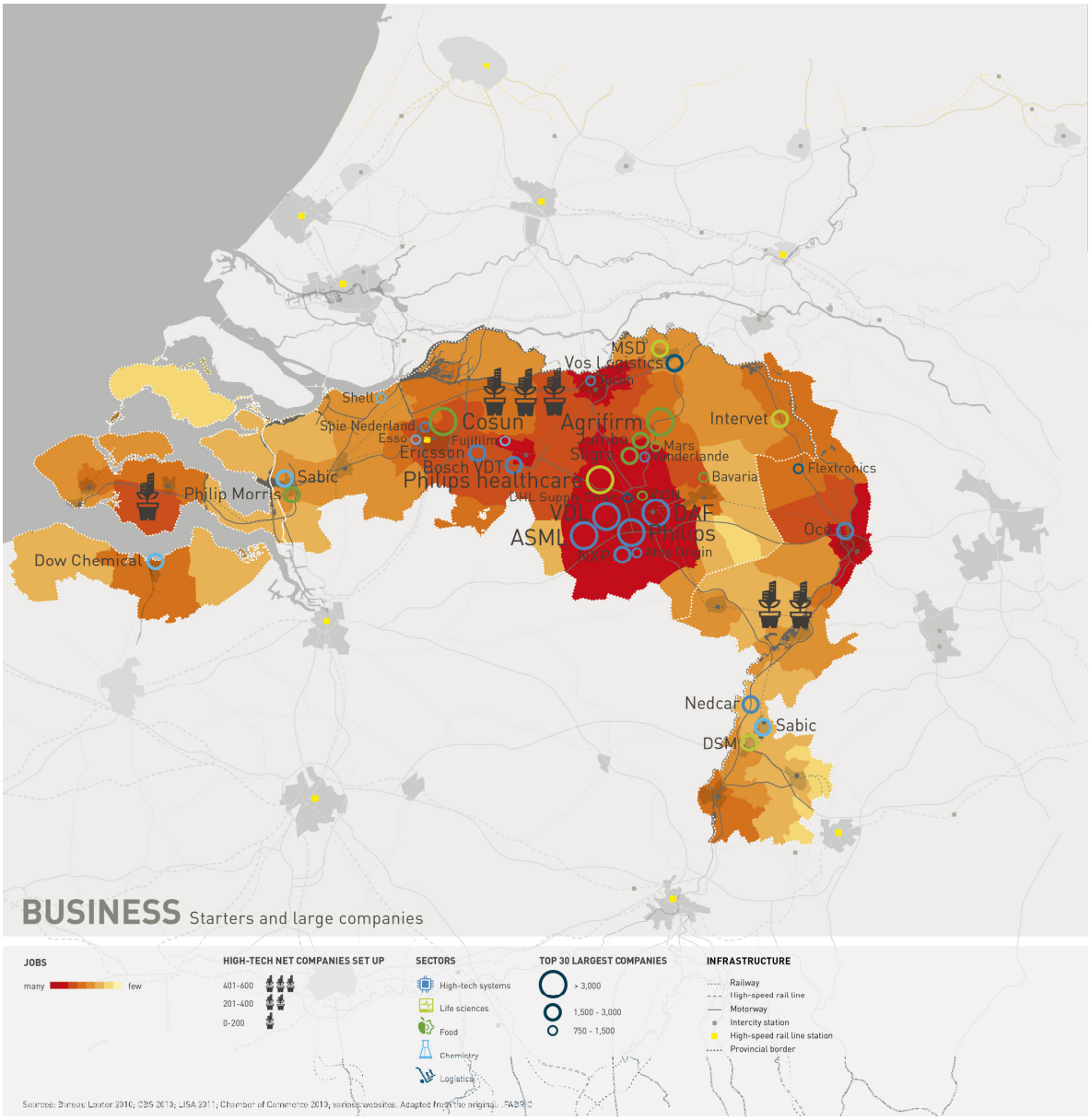
This map shows the private R&D in Zuid-Nederland. It comprises the following indicators:

- Background: Innovation R&D wage costs (report by Bureau Louter based on Promotion of Research and Development Act [WBSO] figures). This map gives details of the location and intensity of the R&D carried out. Since use is made of WBSO figures, SMEs also come out well here.
- Cooperation in innovation: the percentages of innovative companies that cooperate at the COROP level are indicated by means of 'light bulbs'. Cooperation in innovation and willingness to do so is an important starting point for cooperation-oriented policy between different regions. These figures provide insight into this. This is why percentages of cooperation have been opted for rather than absolute numbers of companies that cooperate with one another.
- Private R&D institutes (based on Technisch Weekblad Index, annual publication) according to FTEs, supplemented by specific sector knowledge (less than 50 FTEs in research).

- Campuses: a distinction has been made between national and international campuses. Important campuses in the surrounding countries have also been included. Campuses have been included on the basis of objective criteria drawn up by Buck Consultants International. These criteria are as follows: An actual location with good possibilities and facilities for establishing businesses that focuses on R&D and/or knowledge-intensive activities, the presence of manifest knowledge carriers and an open innovation environment. Mature campuses have been included as international campuses and campuses in the growth and start up phases, as national campuses. Campuses are important focal points for R&D and cooperation. Because campuses are the links between public and private research, they have been included in both the private and public technology maps.

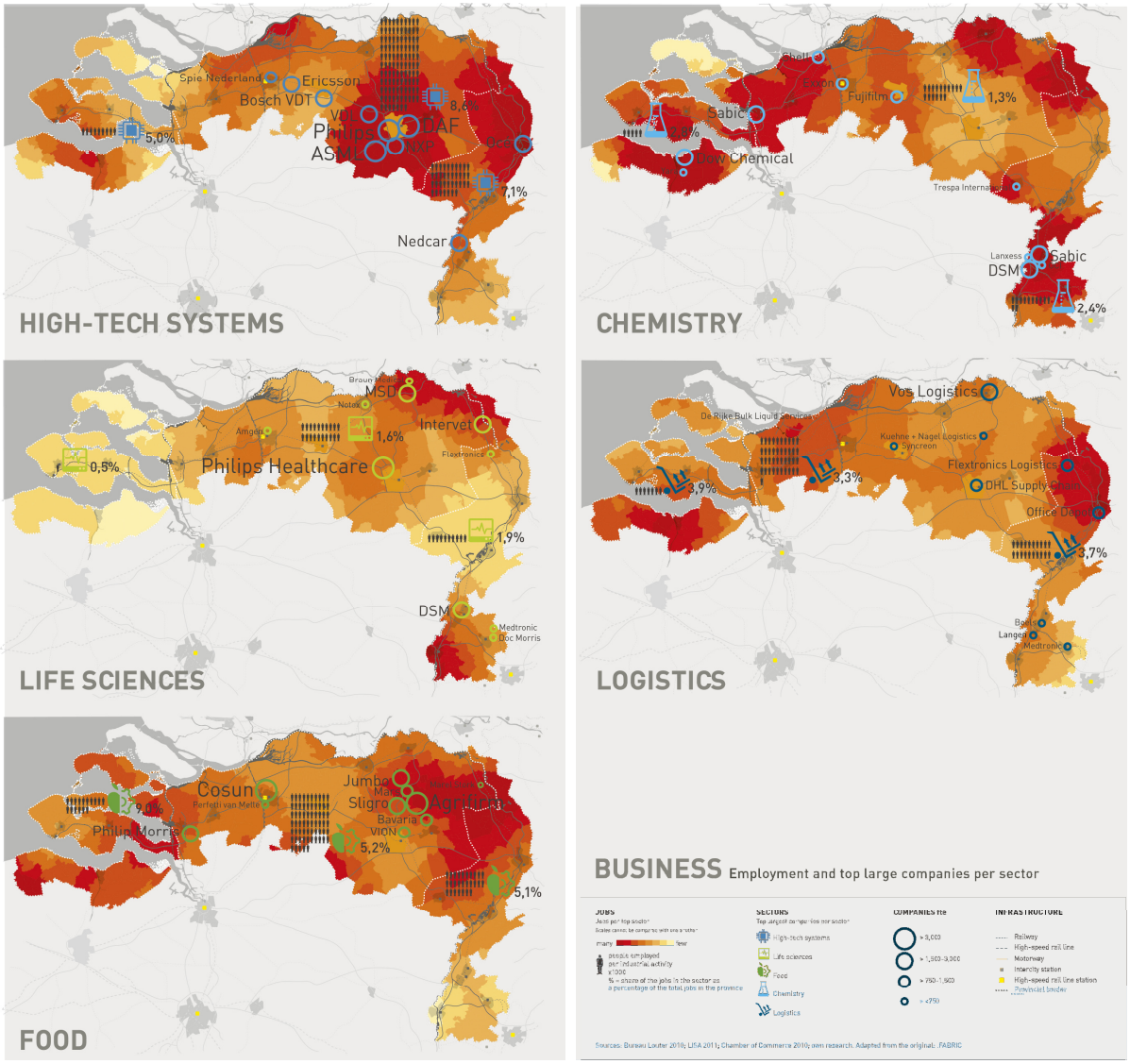


This map shows the employment per province in absolute and relative figures in each of the top five sectors by means of icons. Absolute numbers are shown in the 'people icons' and relative numbers in the percentages, which show the jobs per sector as a share of the total number of jobs in the province. The top sector demarcation is the guiding principle here. Definitions and static demarcation are based on 'Monitoring topsectoren', an analysis carried out by the CBS.



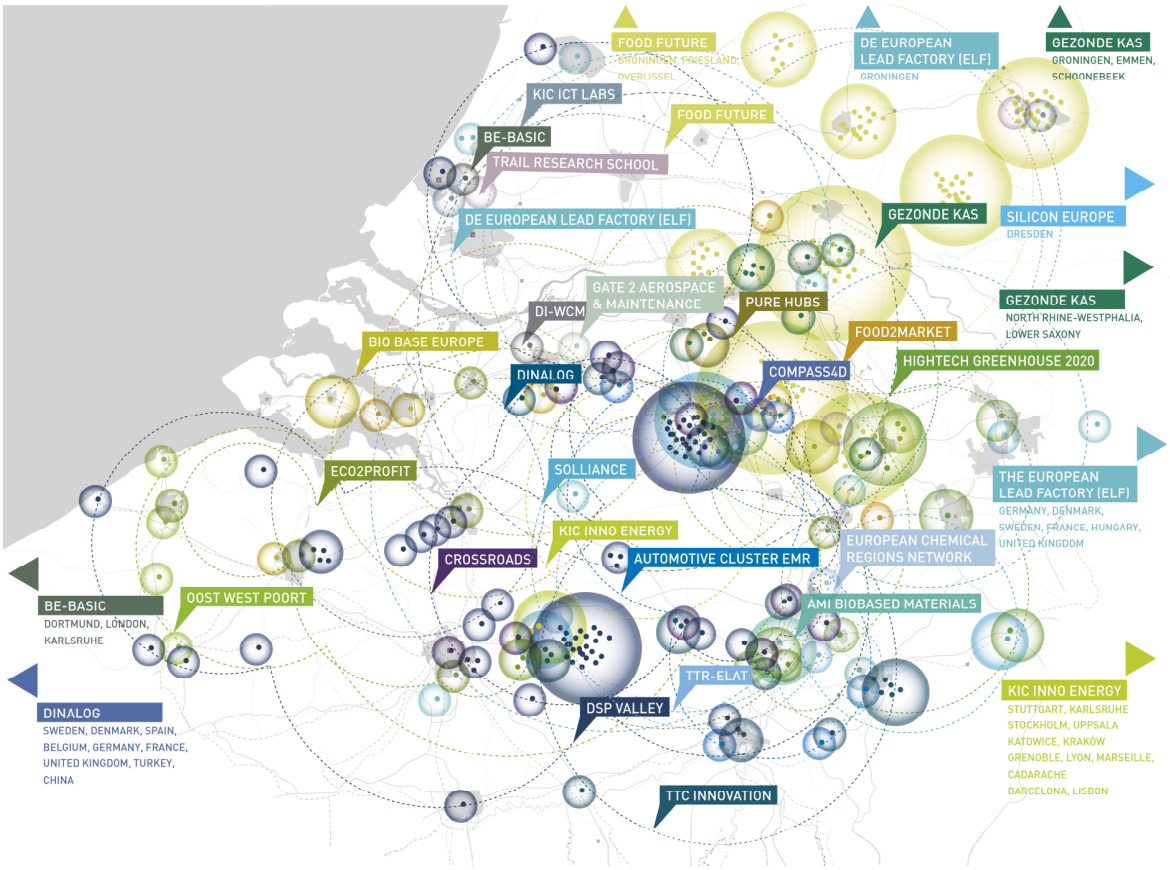
This map shows the employment in general and the business sector present in Zuid-Nederland in the top five sectors: HTSM, Life Sciences & Health, Agriculture & Food, Chemistry and Logistics. Each top sector has its own colour and icon so that the three business maps can easily be compared with one another. This (the first) business map shows the complete picture of the largest companies in the five sectors. The indicators are:

- Background: Employment (number of jobs, Bureau Louter). This gives a detailed picture of the employment at the municipal level.
- The top largest companies, in terms of FTEs, in the five selected top sectors (via the Chamber of Commerce and company websites).
- The net number of high-tech businesses set up in each province in 2011 (= net difference in the number of businesses in technology-intensive sectors with a year earlier). This gives a picture of the business dynamics in knowledge-intensive sectors.



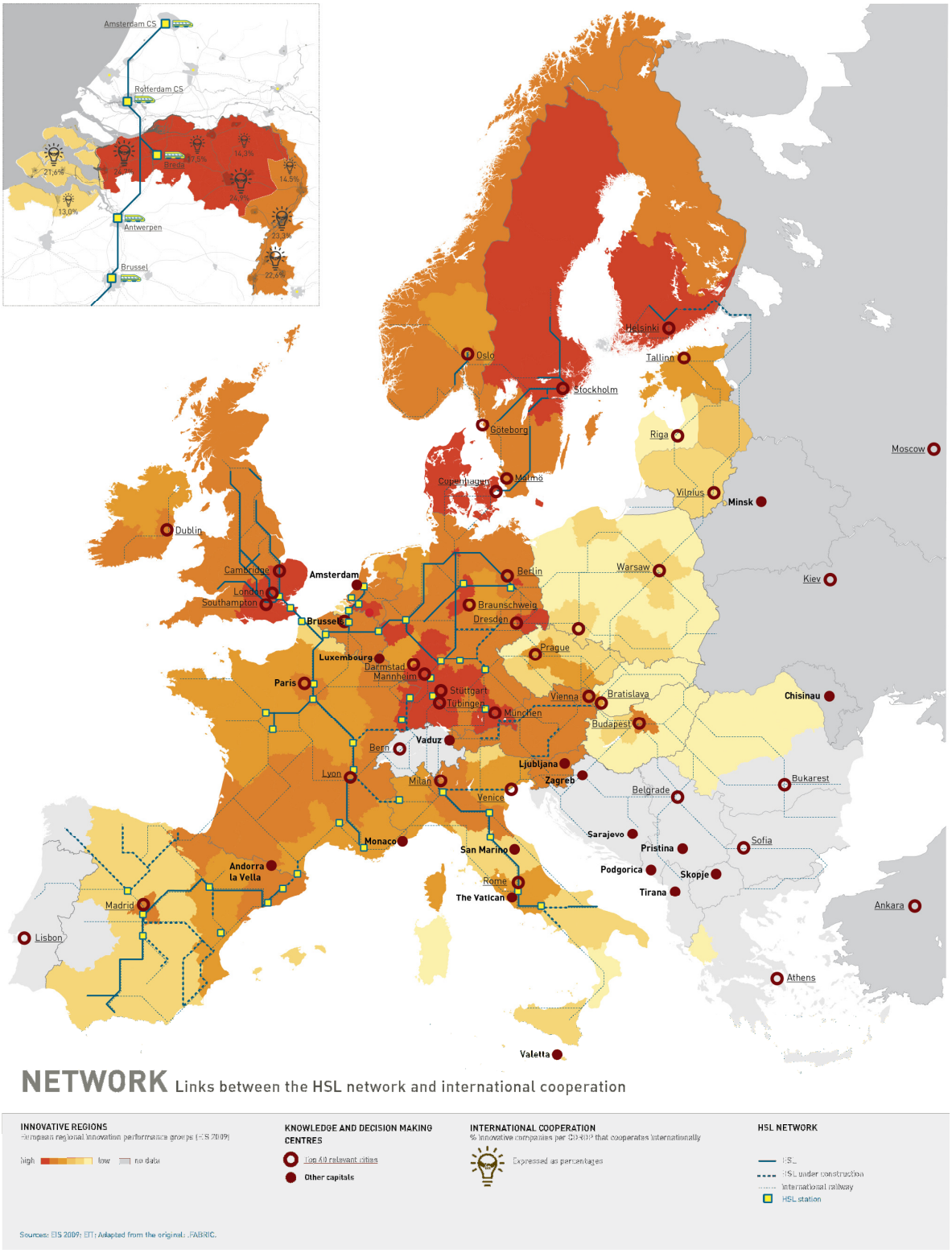
The five maps on this and the next page show the distribution of the top sectors across Zuid-Nederland. Since the same scale has been used for company size on all the maps, they can be compared with one another. These maps have been drawn up because the map showing the top companies was dominated by a number of top sectors, thus shedding too little light on other sectors which, because of the sector structure, do not comprise many large companies.
The map comprises the following indicators:

- Background; the heat maps show the spread of employment per top sector across Zuid-Nederland. A report by Bureau Louter was used for this. The colours do not, however, indicate absolute numbers, which means that the background colours cannot be compared with one another.
- The absolute and relative numbers of employed people per province per top sector. The percentage gives the jobs in each top sector as a share of the total number of jobs in the province.
- The top ten large companies per top sector in terms of FTE; here we opted for companies that operate for gain (hospitals are therefore not included in Life sciences as they are already incorporated in the technology maps). The relevant information has been collected from the Chamber of Commerce register, company websites, public sources and knowledge of companies in our own region.



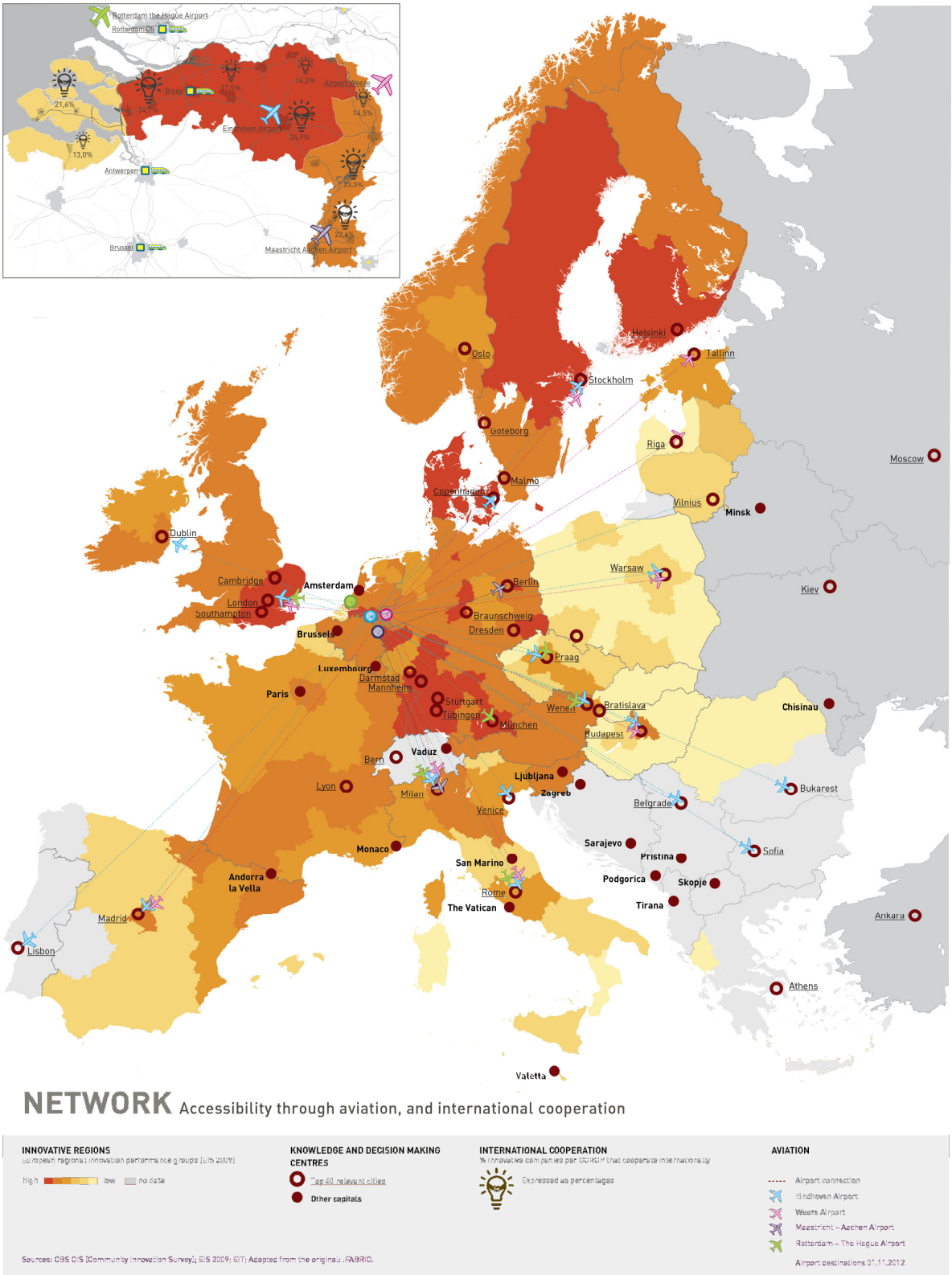
This map gives an illustrative (and therefore not exhaustive) picture of cross-border and international relationships in the form of strategic cooperative ventures, networks and projects.

AMI Biobased Materials www.amibm.org	Bio Base Europe www.bbeu.org, www.biobaseddelta.nl
TTR-ELAt www.elat.org	Food2Market www.food2market.eu
TTC Innovation www.ttc-innovation.eu	Automotive Cluster EMR www.acemr.eu
High Tech Greenhouse	Gezonde kas www.gezondekas.eu
Crossroads www.crossroadsproject.eu	European Chemical Regions Network www.ecrn.net
ECO2Profit www.eco2profit.eu	Compass4D www.compass4d.eu
DSP Valley www.dspvalley.com	Silicon Europe www.silicon-europe.eu
Oost West Poort www.oostwestpoort.eu	KIC ICT Labs www.eitictlabs.eu
Solliance www.solliance.eu	DI-WCM, Maintenance Education Consortium www.worldclassmaintenance.com , www.innmain.eu
Pure Hubs www.purehubs.eu	Dinalog internationaal network www.dinalog.nl
KIC Inno Energy www.kic-innoenergy.com	TRAIL Research School www.rstrail.nl
Gate 2 Aerospace & Maintenance www.gate-2.nl	BE-basic www.be-basic.org



This map shows the potential for international cooperation in the field of knowledge. To be more specific, it shows the accessibility (in terms of passenger transport) of relevant destinations in Europe for the business sector in Zuid-Nederland by the high speed train network and the vicinity to High Speed Train stations. The intensity of international cooperation is, furthermore, shown on the inset. The map comprises the following indicators:

- Background: the most innovative regions in the EU according to the Regional European Innovation Scoreboard.
- Top relevant destinations in the EU (knowledge and decision making centres). These were selected on the basis of:
    - The PBL Netherlands Environmental Assessment Agency (PBL) report on international competitive positions and place of business; competing regions in Noord-Brabant;
    - The top 20 regions on the Regional Innovation scoreboard;
    - The relevant capital cities.
- International cooperation per sub region (COROP level); the share of innovative companies that cooperate on an international basis (on the inset).



This map shows the potential for international cooperation in the field of knowledge or, to be more specific, the accessibility (passenger transport) of relevant destinations in Europe for the business sector in Zuid-Nederland by air from regional airports in Zuid-Nederland (Eindhoven and

Maastricht/Aachen) and in the adjoining area (Rotterdam, Weeze). The intensity of international cooperation is, furthermore, shown on the inset.
The map comprises the following indicators:

- Background: the most innovative regions in the EU according to the Regional European Innovation Scoreboard.
- Top relevant destinations in the EU (knowledge and decision making centres). These were selected on the basis of the following:
    - The PBL report on international competitive positions and places of business; competing regions in Noord-Brabant;
    - The top 20 regions on the Regional Innovation scoreboard;
    - The relevant capital cities.

  The regional airports from which direct flights go to these destinations were looked at.
- International cooperation per sub region (COROP level); the share of innovative companies that cooperate on an international basis (on the inset).

4 SWOT (Strengths, Weaknesses, Opportunities and Threats)

The strengths of the clusters in Zuid-Nederland provide an excellent breeding ground for innovation in other sectors, the effects of which extend throughout the entire region. Cases in point are the networks of companies and knowledge institutes have built up around the maintenance and sustainabilisation of process plants (food and chemistry) and aircraft/helicopters (in the Maintenance cluster). The same applies to the logistics innovations resulting from changes in product and value chains. In Zuid-Nederland, various subregions are actively setting out in more detail the ambitions of the national top sector 'Logistics', with particular attention for fields such as synchromodal transport, smart vehicles and chain control (cross channel control towers). A region that is at the international forefront in the High-Tech Systems, Chemistry and Agriculture & Food sectors also has an excellent starting point for the transition towards a biobased economy. In Zuid-Nederland, various companies and knowledge institutes have set up initiatives to produce new green raw materials and, furthermore, to produce biobased materials from these raw materials, for the automotive, construction, packaging, food and feed and pharmaceutical industries. There are many Agriculture & Food-related cross-border links, with regard to knowledge, food flows and markets for food chains and increasingly for knowledge-intensive products and production systems. In conclusion, Zuid-Nederland will, of course, also contribute to innovation in various divisions of health care. The emphasis here will be on healthy nutrition, on the development of new medical equipment and treatment technologies and smart care, for which testing grounds are being set up in the regions.

Zuid-Nederland's strong position with regard to the economy and innovation, and the link between working and living climates and quality of life, give it an excellent competitive position. But there is an urgent need to maintain and further expand this position. Authorities are investing substantially in the competitiveness and appeal of the business climate for companies, R&D organisations and knowledge workers, in particular in emerging market countries.
Zuid-Nederland's strengths and potential will be exploited in functional networks and value chains with supraregional, cross-border and international relationships.

Strengths		**Problem areas**
High participation in lifelong learning	PEOPLE	A shortage of technical talent An inflexible labour market
Strong international knowledge position Unique open innovation system	TECHNOLOGY	Public R&D expenditure below the critical limit Utilisation of opportunities in Europe Continuity of knowledge investments
Competitive global supply chains Multidisciplinary engineering	BUSINESS	Too little market focus in new developments Shortage of risk capital
Excellent environments for the knowledge economy Quality of life	BASICS	Connectivity: Road HSL Air Water pipeline connections International image Too little pride

Strengths		Problem areas
Triple helix cooperation	GOVERNANCE	Speed of decision making
Cross-border and international connections		Legislation, regulations and shortcomings in the infrastructure (road, rail, water and pipeline) that hamper cross-border cooperation

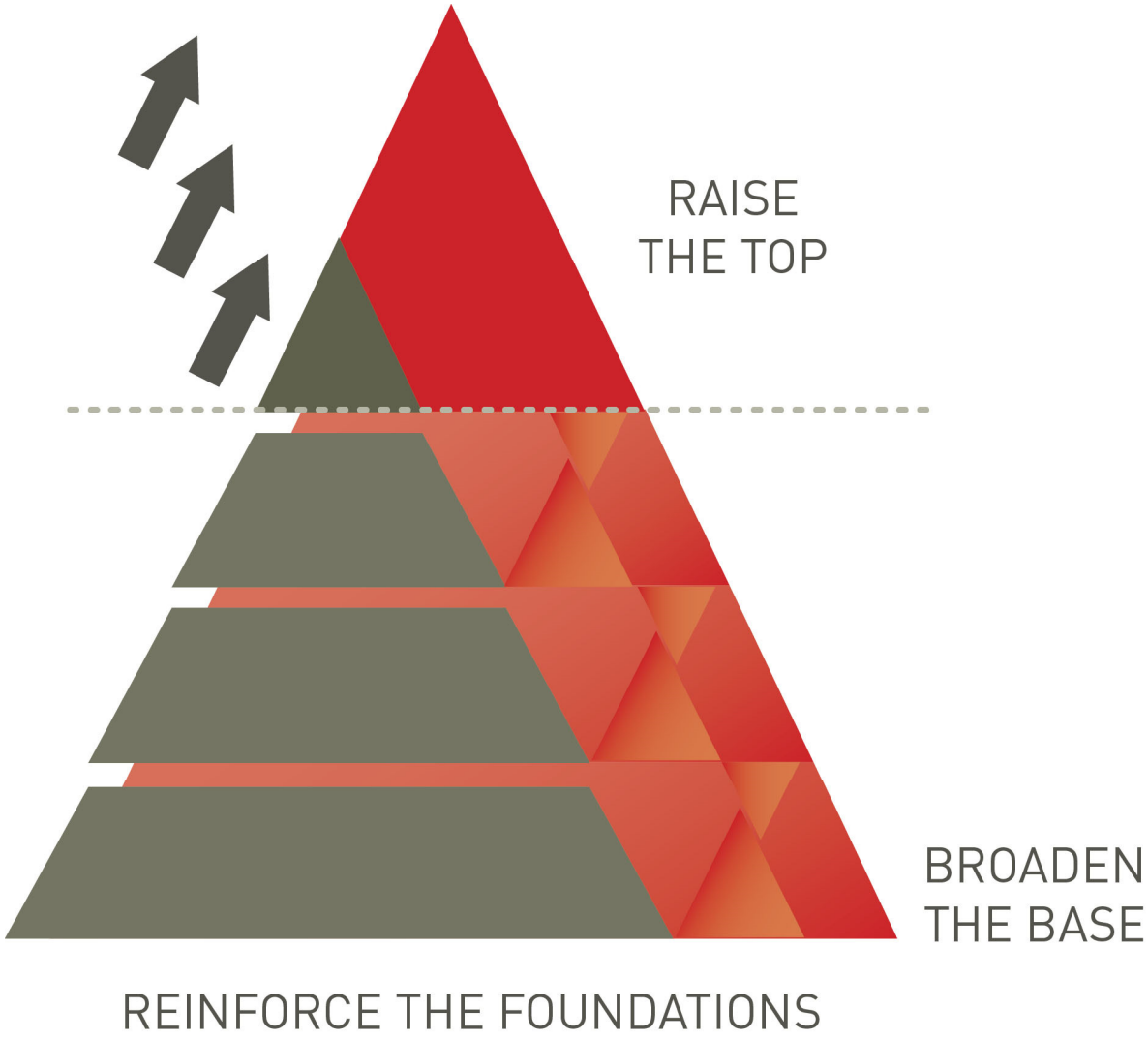
The true strengths of the region are based on the art of combining forces and on interdisciplinary and multidisciplinary engineering. The challenge lies in deploying these competences with even more market focus.
Many value chains extend beyond Zuid-Nederland's borders, geographically speaking. A large concentration of Tier I and Tier II suppliers are located in the immediate vicinity of OEMs, but many companies and institutes located elsewhere in the Netherlands, Flanders and Germany also form part of the value and supply chains in question. Examples include cooperation in biobased activities with Flanders, Zeeland, West-Brabant and Zuid-Holland, cooperation in the field of thin-film PV in the Solliance partnership in Eindhoven-Leuven-Aachen, the important relationship between IMEC and the semiconductor industry, cross-border networks in the field of embedded systems, the 3TU cooperation between TU Delft, TU Eindhoven and Twente University and the cooperation between DSM, UM, and RWTH Aachen resulting in a knowledge institute for biobased materials at Chemelot Campus. We also see campus developments, such as Campus Arenberg in Leuven, the Johnson&Johnson Campus in Beerse and the RWTH Campus in Aachen, where knowledge and business partners are located and facilities provided, in adjoining countries. Presorting is carried out on the basis of the realisation of new KICs within the framework of the EIT. International cooperation is a 'condicio sine qua non' here. The provisional themes for future KICs are: Added-Value Manufacturing, Food4future, Innovation for healthy living and active ageing, Raw materials, Smart secure societies and Urban mobility.

The region is strong but, like all other regions, it is under the persistent and intensifying pressure of globalisation. It must therefore be permanently alert and develop the capacity to deal with the dynamics of globalisation. This applies both at the level of sectors and their clusters and to the basic conditions for a knowledge-intensive economy. Zuid-Nederland competes directly with other international innovation regions in and outside Europe. Fundamentally, it is all about the presence of public knowledge institutes and attracting and keeping R&D, talent and capital for new business development. The challenges facing the region include:

- developing, attracting and retaining sufficient talent;
- attracting sufficient risk capital;
- diversifying the economy;
- increasing its capacity to valorise research;
- expanding its international reputation and visibility;
- attracting public and private R&D investments from outside the region.

Zuid-Nederland has to be as attractive as possible for companies, residents and visitors if the region is to keep its international competitiveness and become stronger. Some conditions for establishing a business focus on the absolute international top, such as innovation campuses and their facilities. But a broader base and stronger foundations are needed before this top can be raised. A broader base entails, for example, getting more activities out of knowledge institutes and larger companies, and the easy availability of capital for entrepreneurs who want to grow. This is important because

many good startup initiatives strand after the pre-seed phase because they get bogged down in the 'Valley of Death´. An adequate influx of young people into technical training and professions and attractive residential and living climates are also examples of factors that strengthen these foundations. In short, it boils down to the fact that we have to reinforce the foundations, broaden the base and raise the top.



5 The strategy, vision and ambition

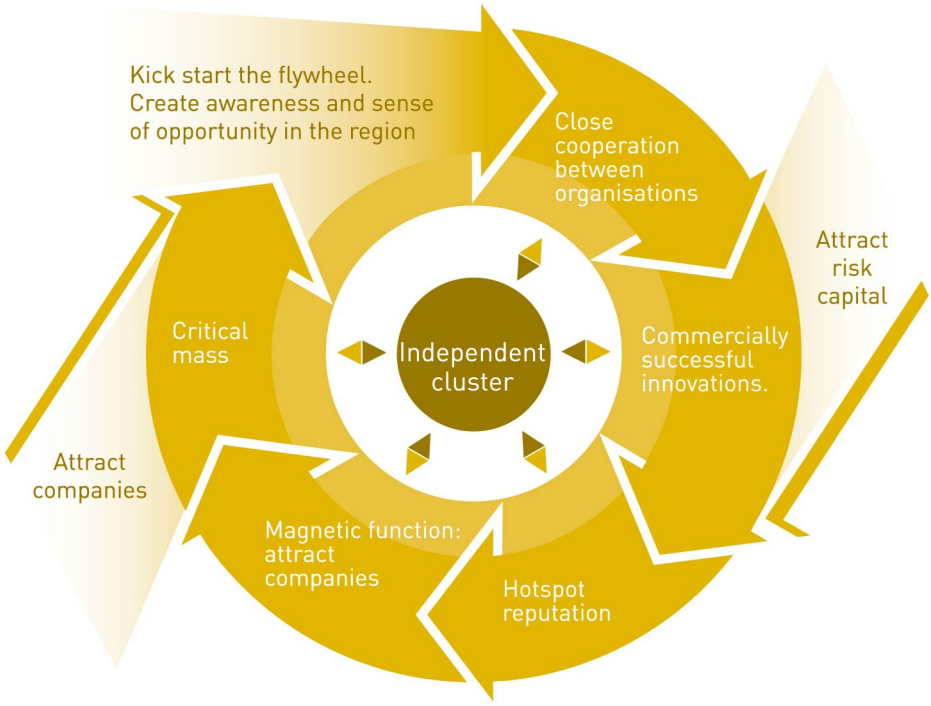
Our mission is to further develop the region of Zuid-Nederland into a top innovative economic region of world stature. After all, half of our economic growth comes from innovation. Only in this way can the region be an important pillar of the Dutch economy. And only in this way can it contribute substantially to achieving the Netherlands´ ambition to achieve and maintain a position in the top five most competitive economies in the world. This is why we are pursuing:

- a position in the top three innovative and competitive regions in Europe;
- an increase in contribution to the Netherlands´ gross national product of € 40 billion* by 2020;
- an economic growth of approximately 3%*;
- testing grounds, with world fame as breeding places for innovative solutions by 2020;
- almost full employment by 2020; everyone is needed on the labour market: knowledge workers and highly qualified technicians, but also skilled workers and craftspeople.

*: The growth percentage of 3% was calculated as follows. The growth prospects of Zuid-Nederland's strengths and potential were analysed on the basis of prognoses of the growth of different markets and historical growth figures in competing regions (Roland Berger 2010). The growth of the rest of the economy was subsequently calculated on the basis of CPB Netherlands Bureau for Economic Policy Analysis (CPB) prognoses. The weighted average of these two resulted in a growth ambition of 3% annually and, in turn, additional earning potential of € 40 billion as at 2020.

6 Focus and priorities

The emphasis will be placed on the basic conditions for a knowledge economy and the organising capacity of a repetitive system of developing knowledge, applying knowledge to new products and markets and, on that basis, developing new clusters and cross-overs between existing clusters. Diversification is also helpful in reducing the susceptibility of a regional economy to fluctuations in specific markets.

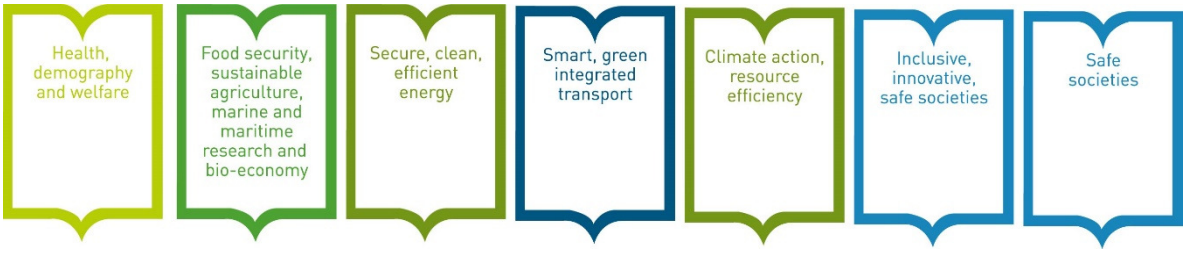


Source: Accenture

6.1 Smart specialisation: the clusters

In addition to the efforts to be made on existing clusters, the region´s strategy is to further develop a number of new or emerging clusters and promote cross-overs between clusters. It will aim at areas where the combined forces of the business and knowledge community can result in achieving or maintaining technological or market leadership. This may be in a B2B market, B2C market or in very specific niche markets. The foundations on which we will be building are sturdy ones. And there is a great deal of growth potential in the HTSM, Chemistry & Materials and Agriculture & Food, Life Sciences & Health, Biobased, Logistics and Maintenance clusters. Various cooperative ventures are working on the development and, just as important, the roll out of new technologies, products and related services.

The areas with growth potential are those that deliver innovative solutions to societal challenges (including health care, mobility, food security and safety, sustainable energy and sustainability in general [circular economy, raw materials efficiency], ...).



There are, for example, concrete plans for working on:

- 'the next OEM';
- a top position as chain director of national and international logistics activities;
- a top institute for diet and health;
- the sharing of research facilities;
- …

Besides the promotion of the dynamics in and between clusters, the promotion of alignment across borders, with other European countries and worldwide, is becoming increasingly important. The incumbent companies and knowledge institutes in the clusters that have made their mark in recent decades are linked, through channels of every kind, with hotspots all over the world.

Example: AMIBM

The cross-border Aachen-Maastricht Institute for Biobased Materials (AMIBM) was recently opened on the Chemelot Campus. Here, Maastricht University (UM) and RWTH Aachen carry out joint research on modern biomaterials, the objective being to develop new, innovative and sustainable plant-based materials to replace fossil fuels. At the Chemelot Campus, the business sector, knowledge institutes and the government cooperate closely, as a result of which public-private partnerships with SMEs and startups can be set up more rapidly and the process from laboratory set-up to production can be accelerated. The partners each make a contribution based on their individual excellence. UM supplies internationally renowned researchers in the fields of biology, computer science, biomaterials science and clinical expertise. RWTH supplies expertise in the fields of molecular biology, plant biotechnology, molecular science and clinical expertise.

Example: Cross-border Cluster Promotion

Companies in the greater Meuse–Rhine Euregion apply to the cross-border innovation fund (GCS) for funding to develop new concrete products and services together with colleagues on the other side of the border. The minimum requirement for eligibility for the fund is that two SMEs on either side of the border are involved. More specifically: for Dutch companies, this entails cooperation with an SME from the Aachen region, provinces of Liège or Limburg (Belgium) or the Leuven region. Large companies and knowledge institutes can join in. Companies may submit an application which is then assessed by an external international expert commission. Assessment criteria are: extent of technology, innovation, market perspectives, international cooperation and an own contribution in the financing. The subsidy for a single approved proposal varies from € 100,000 to € 250,000. The maximum subsidy percentage is 50%. The proposals must focus primarily on technological themes, such as those promoted in the Meuse-Rhine Euregion: high-tech systems, medical technology, biotechnology, chemistry, biomaterials, energy, etc.

Zuidwest–Nederland top logistics region

In recent years, Zuidwest-Nederland has been very successful in attracting logistics centres of internationally operating companies, as have regions in Zuidoost-Nederland. The presence of shippers and carriers, Dinalog and the third largest deep sea port of the Netherlands is facilitating the development of an ecosystem for implementing pioneering innovations in company chains. Work is currently being carried out with various companies on combining cargo flows from companies to domestic destinations (retail) and to regions abroad. For international transport, more use will be made of modalities other than road transport than is currently the case. Given the extensive goods flows between the main ports Rotterdam and Antwerp, there are also various opportunities in the region for intensifying transport by pipeline as well as extra transport via inland waterways, rail and/or short sea. Attempts are being made, in cooperation with Dinalog, to make companies' supply chains smarter. Dinalog has developed various tools (such as databases, tags for goods flows and smart planning applications for combining flows, etc.), which are now being put into practice by companies in the Zuidwest region. Examples are optimum planning for the supply of parts from companies in the process industry to the aerospace sector (known as service logistics) and the development of control towers to optimise goods flows from multiple companies simultaneously. In this manner, Zuidwest-Nederland will also become a top national and international region in the field of innovation and cooperation will take place with neighbouring regions in Zuid-Holland, Flanders and Zuidoost-Nederland.

Example: Silicon Europe

Four of the leading European micro and nanoelectronics regions have combined their research, development and production expertise to form a transnational cluster. This cluster comprises four national consortia that are based on triple helix cooperation: Silicon Saxony (Dresden), Point-One (Eindhoven), Minalogic (Grenoble) and DSP Valley (Leuven). The cluster focuses on guaranteeing Europe's position as the global centre of energy-efficient electronics. The Silicon Europe cluster represents 800 companies and institutes, 75% of which are SMEs, and more than 60% of the jobs in this sector in Europe

Bio Base Europe

Partners in Zuidwest-Nederland and Flanders have been cooperating on speeding up the development of the biobased economy since 2009. Bio Base Europe enables cross-border cooperation between Biopark Terneuzen/Biobased delta and Ghent Bio-Energy Valley.

In 2009, Bio Base Europe set up a pilot plant in Ghent where tests (pilots) are carried out for companies in the region and elsewhere in Europe, the objective being to accelerate biobased processes. The pilot plant has test facilities for processing biomass (separation, fermentation, thermal processing, etc.). Bio Base Europe has also set up an educational and training centre in Terneuzen. Various courses have been given for companies at Bio Base Europe since mid-2013 and the premises also house a permanent exhibition on the biobased economy that focuses primarily on school going children. The training centre is also the meeting place of partners in the Flemish-Dutch Delta. Many symposia, workshops and meetings are organised at this centre. Bio Base Europe is the core for further cross-border cooperation in the field of the biobased economy for Zuidwest-Nederland and Flanders. Bio Base Europe was officially opened by Mr Peters, the prime minister of Flanders, and Mr Verhagen, the then vice-premier of the Netherlands, in June 2012.

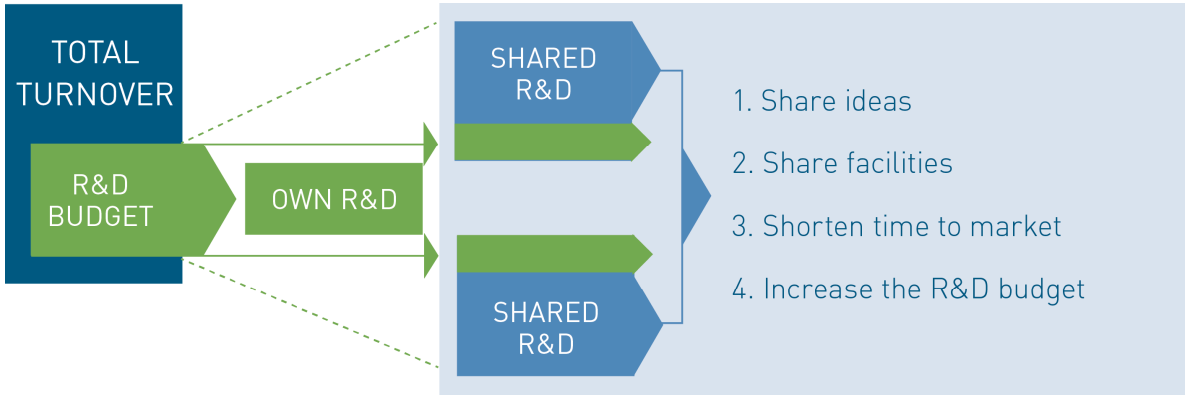
Green Chemistry Campus

As a result of the Biobased Innovations programme, which was started several years ago, the Green Chemistry Campus was opened in Bergen op Zoom in 2011. In addition to housing small companies and research cores of institutes such as TNO and the Flemish Institute for Technological Research (Vito), the Green Chemistry Campus provides facilities for large and small companies to work on an open innovation platform in the field of bio-aromatics. The core of this development is that residual agricultural flows from the wider region (arable farming) are utilised as green building blocks for chemistry through biorefining. The Green Chemistry Campus is anticipating and catering to a turn in developments in chemistry because of the emergence of shale gas. Research is being carried out on bio-aromatics that are important for industry but cannot be manufactured from shale gas. The unique point about the bio-aromatics programme is that multiple companies participate in research platforms to build up experience with new technology while working on their own applications. Open innovation is thus combined with company-oriented and private research. Besides providing a business incubator and housing the shared bio-aromatics research programme, the aim of the partners is to realise a pilot factory for bio-aromatics on the Green Chemistry Campus by 2015.

6.2 Smart specialisation: the method

The focus on sectors and clusters entails various aspects, including the processes by which they develop and enhance their competitiveness. R&D and innovation increasingly take place in innovation networks, open or otherwise. Innovation in ecosystems is an essential distinguishing principle in achieving a position at the forefront, particularly when cooperation-based innovation (that is, open innovation) is involved. Among other factors, open innovation is driven by the following:

- R&D costs are growing faster than the revenues of individual companies;
- The complexity of issues and solutions is increasing and requires multidisciplinary cooperation;
- Breakthroughs are often realised on the interface between technologies or by convergence of technologies in particular areas of application;
- Product life cycles are shortening and there is therefore a need for shortening time-to-market;
- The increasing specialisation of individual organisations means that they need to use internal and external knowledge sources;
- The sharing of ideas, costs, risk and capacity in R&D.



Source: Holst Centre

Businesses are becoming increasingly dependent on their suppliers, knowledge institutes and other companies when it comes to innovation and technology development. The close proximity of suppliers reinforces the flexibility of OEMs, a point that is becoming more and more important, not only in the field of R&D, but also with regard to production. The availability of a broad range of SMEs increases flexibility and possibilities for specialisation. Regional embedding and innovation ecosystems play a crucial role here. This is expressed by, among other things, the phenomenon of proximity in networks and clusters, the creation of conditions for (pre-competitive) cooperation in the fields of R&D and innovation, the sharing of facilities, mechanisms for technology and knowledge transfer, support for the valorisation of research and business start-ups, IP management and co-location on campuses.
These are the elements we want to enhance. The character of innovation is also changing. There is increasing interest in the integration of the following processes in innovation itself:

- social innovation;
- design disciplines as enablers of innovation;
- co-creation;
- living labs and
- testing grounds; there is the ambition to set up large-scale testing grounds in the fields of, among other things, smart care, smart mobility and sustainable energy.

The use of these processes is an integral part of the strategy. The implementation will be based on shared, supported roadmaps. Mechanisms will thus be set in motion which, in time, will further reinforce, enrich and diversify the economic structure.

This is why the focus will be placed on:

- the existing clusters in top sectors;
- social challenges as the point of departure for cluster development;
- strong chains, bases and tops;
- more added value and higher productivity;
- a committed, enterprising, open and cooperation-oriented culture.

Example: CLICKNL
CLICKNL links the world of knowledge to the creative business sector. It is a network of networks that is geared towards cross-overs that fit in with the creative industry's ambition to find new solutions for social and economic challenges together with other top sectors. ClLICKNL is a Top consortium for Knowledge and Innovation (TKI) within the framework of the Creative Industry. Novel approaches, with input from the discipline of design, involving Experimental Design Landscapes (EDL), among other things, are being used to work interactively and iteratively on innovation processes. Examples include: smart & open light, smart empowerment for healthy living, smart mobility and smart life cycles.

Smart specialisation pursues cross-overs with and between the sectors/clusters identified. It pays explicit attention to the processes and methods for realising these cross-overs and creating conditions for realising combinations and cooperation between companies, particularly SMEs, research institutes, universities and institutes and institutions for higher an vocational education.

7 The policy mix

Important success factors in regions that compete with Zuid-Nederland are: continuity of policy, focus on clusters, cluster-specific support and decisive organisations with executive authority and mandate. Zuid-Nederland must therefore concentrate on these factors. At the same time, critical mass and sufficient private & public R&D play an essential role in development. An integrated approach targeting the People, Technology, Business and Basics domains is a primary precondition for success. Adequate triple helix governance structures ensure the commitment of stakeholders and their specific roles in the process of strategy development and implementation of that policy.

Despite a large self-organising capacity at regional level, the policy mix is characterised by a multi-level governance angle. Problems and opportunities must be tackled at the most appropriate scale level, where the policy responsibility lies and suitable instruments are available. For promoting innovation, for example, the regional scale level is the most appropriate as this is the level on which actors cooperate intensively with one another. It is, furthermore, important that regions fit in with the central government and EU's policy and instruments. In the case of the EU, these include the functioning of the internal market, the European Research Area, the Horizon 2020 programmes (including the EIT and current and future KICs), COSME and the Structural funds. In the case of the central government, these include policy on education, science, innovation and infrastructure. At the scale level of the regions in Zuid-Nederland, the emphasis is on the further development of clusters, or the regional innovation ecosystems, and on the relationship between education and the labour market. As regards increasing the intensity of R&D, the aim is to raise public R&D expenditure from the current € 0.35 billion to € 0.65 billion by 2020, and to raise private R&D expenditure from the current € 3.3 billion to € 4 billion by 2020.

The policy mix is based on the following five domains: People, Technology, Business, Basics and Governance. These domains jointly determine the business climate in a competitive environment, global or otherwise. The aims within the domains are to exploit strengths and tackle problem areas: This is all about the creation of maximum innovation and valorisation dynamics in and between established clusters and clusters with growth potential, the retention and growth of employment and, furthermore, the valorisation of knowledge via valorisation programmes and SME valorisation procedures.
These aims require a set of preconditions that have to be just right. The mix of actions is geared at:

- An internationally competitive labour market;
- A top international position and open innovation;
- Entrepreneurship and excellent supply chains;
- An internationally attractive business climate;
- Adequate governance.

Zuid-Nederland is committed to applying this policy mix, comprising the five aforementioned domains, to the top clusters and the cross-overs between them. The following three movements, which are important for Zuid-Nederland's economy, will be launched:

- The creation of innovations and new activities in these basic sectors;
- The support of the transitions of these sectors to new markets, better innovation processes, new products and services and more sustainable production processes;
- Building on and maintaining strength and power and utilising growth potential via cross-overs.

The financial efforts (investments and expenditure) for the period up to 2015 for actions regarding the five domains have been estimated at approximately € 2 billion annually and can be divided as follows (these percentages are indicative):

- EU 4%
- Central government 35%
- Region 61%
    - Authorities 15%
    - Knowledge institutes 6%
    - Companies 40%

The five pillars or domains will subsequently be elaborated. The pillars have a main objective and sub-objectives. The sub-objectives can be further divided into actions. The scope of this document is restricted to describing the main and sub-objectives. The action agendas are described in more detail in the underlying documents to this strategy.

PEOPLE

An Internationally Competitive Labour Market

Objective: sufficient and qualified manpower at all levels with competences that are geared to top clusters and developing clusters.

The central factors in the People domain are people, employment and the labour market. New economic activities arise at interfaces between companies (innovative or otherwise) and traditional sectors. These require different competences and must be adequately catered to if a continuous fit with the labour market is to be realised. Zuid-Nederland pursues the concept of ´lifelong learning´. Projects in this domain have to do with the labour market, development of competences and promotion of entrepreneurship. Special attention is being paid to getting young people interested in the employment sectors of the future, careers in science&technology and/or as entrepreneur, the stimulation of lifelong learning, continuous MBO/HBO/WO learning lines and attracting international knowledge workers. The challenge is to ensure the availability of sufficient and qualified manpower at all levels, in a market of increasing scarcity.
In the People domain, we can distinguish between the following lines of action:

1 Excellent education, at all levels, which is geared to the needs of the clusters. This can be achieved by continually adjusting curricula to match the business drive (or developments in the business sector), by promoting contact between the educational sector and business practice and by promoting entrepreneurship.
2 A greater influx and attracting national and international talent, particularly technical talent.
3 A flexible labour market.
4 Sustainable availability of the working population (lifelong learning).
5 An experimental region for labour market policy.

Example: Technologiepact Brainport (The Brainport Technology Pact)

The flexibilisation of the labour market and tackling shortages of scientific and technical talent are two of the most important challenges in exploiting the growth potential in the Brainport region. The pressure on the labour market in the heart of the Dutch knowledge and manufacturing industry is great, too great.

By way of illustration: annual shortages of technicians in the following orders of magnitude are expected for the different levels of education:

pre-vocational secondary education (VMBO): 825 for Zuidoost-Brabant, 3,300 for the whole of Zuidoost-Nederland;
MBO: 1,200 for Zuidoost-Brabant, 3,700 for the whole of Zuidoost-Nederland;
HBO: 600 for Zuidoost-Brabant, 1,200 for the whole of Zuidoost-Nederland;
WO: 400 for Zuidoost-Brabant, 800 for the whole of Zuidoost-Nederland.

Brainport has proposed a partnership with the cabinet within the framework of the national Technology Pact. The proposal comprises four lines of action with national and regional impulses:

1 to realise a higher influx into science and technical courses and the labour market;
2 to raise the quality of education at all levels so that it fits in with the needs of the top sectors;
3 to keep people in technology;
4 strategic cooperation.

Example: Brains Unlimited

Brains Unlimited is an international imaging centre that provides both research and educational services for industry and the academic world. It is a division of the Maastricht Health Campus and it functions as an imaging platform for scientists and the business sector. The centre carries out research on many common diseases, such as Alzheimer's disease, Parkinson's disease, epilepsy, schizophrenia and multiple sclerosis, and also into the development of human behaviour. Brains Unlimited cooperates intensively with a similar centre in Jülich and also, for example, with partners in Liège.

Example: The Maintenance Education Center

Efforts to realise a world class position in the field of maintenance are being concentrated on innovation and knowledge development. The Dutch Institute World Class Maintenance (DI-WCM) uses a demand-driven innovation agenda with six themes that are extremely important for strengthening Dutch industry: personnel for and the implementation of maintenance, maintenance systems, maintenance-aware design, monitoring based maintenance, major maintenance/stop management and physical phenomena. Innovation and knowledge development are practically driven and are realised via applied scientific research. The Maintenance Education Center contributes to this with the following objectives:

- Raising maintenance education to World Class level and reinforcing its profile in the continuous learning line of the vocational education sector (VMBO-MBO-HBO-WO);
- Promoting new enrolment;
- Promoting and improving the cross-sectoral transfer and promotion of maintenance professionals;
- Improving the image of technology, and maintenance in particular;
- Developing innovative learning environments such as Virtual Reality;
- Developing excellent maintenance training centres;
- Knowledge development by practically driven and applied scientific research;

TECHNOLOGY

An International Top Position And Open Innovation

Objective: an international top position in research and development and in the valorisation of knowledge in the top sectors, addressing societal challenges.

Projects in the Technology domain focus on reinforcing and attracting research centres and promoting innovation, cooperation and knowledge transfer. The linking of new technology to sectors with growth potential that can help solve social issues is vital. In Zuid-Nederland, this is realised by promoting new companies, supporting transition in the basic sectors (that is, the top clusters distinguished in the RIS3) and actively linking these and other sectors through cross-overs. The objective is a top international position in research and development and the valorisation of socially-oriented knowledge in the top sectors. The shift from technology push to technology pull will have to be realised, which means that demand from the business sector will largely determine the content of technology programme agendas. In the Technology domain, we can distinguish between the following lines of action:

1 Guaranteeing the open innovation ecosystem (by cooperation between companies and knowledge institutes);
2 Creating mass and focus in public R&D infrastructure;
3 Improving connections between public and private R&D capacity;
4 Optimally exploiting Zuid-Nederland's leading knowledge and technology position in the European knowledge infrastructure;
5 Linking more research, research centres and research programmes to company clusters in the regions;
6 Given the crucial role of SMEs in the valorisation of knowledge, working on accessibility and the position of SMEs in research programmes and open innovation ecosystems;
7 Making Zuid-Nederland into a testing ground for the application of the developed knowledge, technologies and related facilities (including scaling-up facilities).

Example: Solliance

Solliance is an alliance between TNO, TU/e, the Holst Centre, ECN, IMEC and Forschungszentrum Jülich for research on, and the development of, photovoltaic technologies (PV) in thin films, that is, with semiconductors other than crystalline silicon and on thin film instead of wafers. Its objective is to organise critical mass and to get the Eindhoven-Leuven-Aachen triangle on the map as a global player in the field of thin-film PV. Solliance connects industry, research institutes and universities. The industrial partners in the project are Smit Ovens, BOM, Brainport Industries, Roth&Rau BV, OM&T, VDL/ETG, Umicore, Philips Innovation Services and Thyssen Krupp. Solliance connects the development of new technology in thin-film PV with its rolling out. Its activities vary from fundamental research and the design of high precision production equipment to the testing and monitoring of equipment and systems.

Example: The Dutch Integrated Testsite for Cooperative Mobility (DITCM)
This is a cooperative venture of more than 20 public and private parties that develop smart mobility solutions on the basis of a shared roadmap and shared facilities. The DITCM's ambition is to be the number one in Europe in developing and testing products and services for cooperative mobility. It will thus contribute to a better flow of products, traffic safety and sustainable transport. In the DITCM, different disciplines converge in an open innovation organisation.

Example: Unihealth (in the field of Life sciences)
This project focuses on the development of a sensor system for the discovery of allergens and biomarkers. Increasing numbers of people are developing allergies to substances in their environments. The objective of the project is to develop a device with which chemicals, foodstuffs and the air can rapidly be tested for allergens. Possibilities for using the device for tracking down biomarkers in clinical care are also being sought. The prevention of allergies and more serious disorders, such as cancer and rheumatism, can be promoted in this way.
The project is led by the Fraunhofer Institute. Various partners in the border region of Germany and the Netherlands participate in the project. It is financed with Interreg IVA Euregion Rijn-Waal funds.

Example: The European Lead Factory (ELF)
The ELF is a new platform for the discovery of innovative medicines and it comprises an international consortium of 30 partners. This cooperative venture is supported by the Innovative Medicines Initiative (IMI). It creates possibilities for the discovery of new medicines by providing public partners with an 'industrial' discovery platform with which advanced academic research can be translated into high quality potential medicines.
This is made possible because, among other things, the ELF has access to an exceptional collection of tiny molecules. Some of the molecules in this collection are delivered by pharmaceutical companies and the rest are newly-synthesized chemical compounds made by SMEs and academic institutes. Knowledge from all the consortium partners is pooled and combined with open innovation and 'crowdsourcing'. The screening, or testing, of this collection of chemical compounds is carried out by the pharmaceutical companies and a newly-established European screening centre.
The seven participating pharmaceutical companies will contribute a library of at least 300,000 chemical compounds from their company collections within the framework of the ELF. A library of an estimated 200,000 additional new compounds will be jointly developed by academic institutes and SMEs. Together, these two libraries will form the 'Joint European Compound Collection' which will comprise a maximum of 500,000 compounds. This collection will be accessible to all project partners and public organisations that put forward promising new targets for screening as potential new medicines.

BUSINESS

Entrepreneurship And Excellence In Supply Chains
Objective: more and more successful new and growing companies in the top and developing clusters.

Measures in the Business domain focus on creating and enhancing networks so that it is easier for companies to do business in the region and internationally. It is also important that investments are attracted from within and outside the Netherlands to reinforce Zuid-Nederland's profile. Measures also focus on helping starting entrepreneurs and promoting innovation in and with SMEs.
The objective of these measures is to get in front of the competition by excelling in the field of entrepreneur dynamics, competitiveness and business climate. Existing companies develop more rapidly in Zuid-Nederland and, as a result, more successful new companies arise here. Furthermore, Zuid-Nederland attracts more business and research activities from abroad. In short: the chances of success for companies in the selected clusters are better here than anywhere else.
In the Business domain, we can distinguish between the following lines of action:

1 More starting and more rapidly-growing innovative companies and the related incubation facilities and services to accelerate progression and flow.
2 More innovation, entrepreneurship and cooperation in and between SMEs and in the supply chains of large companies.
3 An enhanced, clear role for the public sector as driver and facilitator of innovation processes.
4 Promotion of investments: a focused and proactive export and acquisition policy (which targets a sustainable fit with the profile of the top locations, regions and subregions of Zuid-Nederland so that existing and yet-to-be-established companies become more firmly anchored to one another and the environment).
5 The initiation and facilitation of business networks around identified joint themes and innovation lines, so that innovation programmes are, and remain, well supplied.

Example: NextOEM
NextOEM's ambition is to increase the number of OEMs by combining breakthrough technology with entrepreneurship and capital. The objective is to accelerate the growth of ten high-tech companies and to raise their turnover to more than € 100 million in a period of five to ten years. NextOEM concentrates its efforts on helping young high-tech companies bridge the notorious 'Valley of Death' (the period between the proof of concept of the technology and the point at which a constant and substantial turnover is achieved).

Example: Bio-aromatics and green raw materials
The market opportunities and social challenges with regard to the biobased economy lie in promoting the sustainability of the chemistry and agricultural sector in the following themes: green raw materials (valorisation of arable crops and algae cultivation), green building blocks for chemistry, greening of the process industry (CO2, water, heat, hydrogen, etc.). Alignment with the educational sector and labour market (Human Capital Agenda) and new product-market combinations (PMCs) on the interface of Agriculture and Chemistry ('Agriculture meets Chemistry'). Examples include bio-aromatics and green raw materials.

A joint research programme based on the bio-aromatics roadmap is taking place, the objective being to have a bio-aromatic demonstration plant available in the region by 2015. The applications of this plant will focus on performance materials, coatings and chemicals. In Zuidwest, attention is being concentrated on new types of cultivation (arable farming and aquaculture) with specific components and biorefining processes to trace these components in plants. This is being elaborated, in cooperation with TNO, the Universities of Ghent and Wageningen and Avans University of Applied Science's Center of Expertise, so that knowledge can be coupled with the business sector.

Example: Logistics, chain direction and synchromodality
Will focus on more efficient transport of goods in the key sectors, Agriculture & Food, Chemistry, Maintenance, Fashion, FMCG and Pharmacy, with the emphasis on a fine delivery network to customers in the Benelux countries and elsewhere in Europe (compile large flows by combining flows from multiple companies). Will accelerate chain direction by delivering partners, tools and knowledge. Existing tools will be used by companies throughout the wider region. This means that high quality tools will be valorised (utilisation by companies will be maximised). There will be a modal shift in key sectors Agriculture & Food, Chemistry and Fast Moving Consumer Goods (both maritime and continental), taking all types of modalities (rail, road, water, air and pipeline) into account.

Example: Underground Inspection & Control and Unmanned Guided Systems.
Approximately 150,000 employees work in the Dutch maintenance market and it is valued at € 18 billion annually. Maintenance is crucial for the functioning of many sectors; without it everything grinds to a halt. It involves high quality, multidisciplinary and cross-sectoral employment. Maintenance activities are coupled to the longest phase of the life cycle of sustainable capital goods. The maintenance costs of capital goods usually amount to two to four times the purchasing costs. Maintenance innovation themes are important for many top economic fields. Cross-sectoral innovation projects at the interface of maintenance and the top fields stand out: the conversion of one-off business into continual business for specialised companies and the realisation of maintenance & repair solutions and facilities including training and education for the international market.
Innovation focusing on underground inspection & control of unmanned systems is an example of a niche field in maintenance (deployment of trenchless technology, new coatings and composite and other materials) relating to inspection and maintenance technologies and the use of new materials in underground piping infrastructure. The deployment of unmanned guided systems for the inspection and maintenance of infrastructure that is difficult to reach and assets where safety is compromised (the process industry, delta works, etc.).

BASICS

An Internationally Attractive Business Climate

Objective: an internationally competitive, attractive business climate for companies and current and future manpower in the top clusters and clusters that are in the process of developing.

The Basics domain focuses on the preconditions for a strong region. A strong business climate in Zuid-Nederland must be supported by appropriate actions in the subregions (Zuidwest-Nederland and Zuidoost-Nederland) to make it stand out from other regions. This domain entails ensuring that all the distinctive basic requirements are met. These include good accessibility, attractive city centres and residential environments, a distinctive cultural and recreational offer, digital infrastructure, an international school, etc.

The objective is to create excellent basic preconditions that will enable Zuid-Nederland to take on the international competition with knowledge environments all over the world by means of an internationally attractive business climate for residents, companies and current and future manpower. This requires an innovative image, a strong international profile and that residents, visitors and professionals all think highly of the region. In the Basics domain, we can distinguish between the following lines of action:

1 Excellent national and international accessibility by means of and between various modalities;
2 Excellent top locations and related facilities for the development and application of the knowledge industry;
3 An attractive residential and living environment for residents and knowledge workers from the Netherlands and other countries;
4 Support in the region and a recognisable image of Zuid-Nederland in Europe and, subsequently, the rest of the world.

GOVERNANCE

Support, Decisiveness And Result Orientation

Objective: adequate monitoring of Zuid-Nederland's strategy (RIS3) and of a cohesive implementation through collaborative triple helix structures (business sector, knowledge institutes and government) in Zuidoost (Brainport 2020) and Zuidwest-Nederland (Strategic Board), with an eye to concluding cross-border and international alliances. With regard to the choice of clusters and cross-overs, Zuid-Nederland has already actively linked up with priorities that have recently become visible in neighbouring regions in the Netherlands, Belgium and Germany.

In Zuid-Nederland, the triple helix structure is utilised both to map out strategy and policy and to implement programmes and projects. This double use of the triple helix structure is Zuid-Nederland's strength.

Brainport Commissie 2020

The Brainport 2020 Commission is currently made up of the boards, comprising representatives of the triple helix, of Brainport Region Eindhoven and Zuid-Limburg (Limburg Economic Development), the King's Commissioners of the provinces of Noord-Brabant and Limburg and the members of the Provincial Executive for economic affairs of these provinces. Its tasks are as follows:

- To coordinate and monitor the supraregional part of the Brainport 2020 agenda by means of quarterly meetings with the triple helix network regions, Brainport, LED, Keyport, Greenport Venlo, 5-Sterrenregion Noordoost Brabant and Midpoint Brabant;
- Where asked, to act as 'coach' for the triple helix regions;
- To ensure that there are links between the region, provinces, central government and Europe without the loss of the specific responsibilities of all the partners involved;
- To report on the progress of the programme to the central government and provinces.

The managements of the network organisations also meet to harmonise activities financed by EU funds and a Taskforce 2020 has been set up to focus on this same area.

Strategic Board Zuidwest-Nederland

The Zuidwest-Nederland Strategic Board comprises representatives of the triple helix with the business sector taking the lead. It is a network organisation in which representatives from the business and educational sectors and the government (the region of West-Brabant and the provinces of Noord-Brabant and Zeeland) are involved.

- The Strategic Board's tasks are as follows:
- The agenda and management of public affairs and lobbying for Zuidwest-Nederland.

- The coordination and management of EU funds and top sectors in The Hague. The setting up of the Deltateam Lobby.
- The coordination and management of the economic agenda in coordination with the relevant steering groups;
- The conclusion of international alliances with the business sector taking the lead;
- The spotting of opportunities, coordination and linking of knowledge with partners in the business sector (large companies and SMEs), educational sector (universities and HBOs such as ROCs) and the government (cities, provinces, central government and Europe).
- The profiling and positioning of Zuidwest-Nederland (marketing).
- Reporting to the stakeholders.

Steering groups have been set up for each spearhead of the Board's strategic agenda. These steering groups are also based on the triple helix structure and the business sector takes the lead. The steering groups are responsible for the preparation and implementation of projects and programmes on the Board's strategic agenda.

8 Monitoring

8.1 Indicators

The RIS-3 Strategies will be monitored by the CBS's Business Economy sector, which will measure a number of indicators for the top sectors in each region.

These indicators are as follows:

- Private R&D expenditure.
- Private R&D expenditure of SMEs.
- Innovative companies: technological innovation.
- Innovative companies: non-technological innovation.
- Innovative expenditure.
- Innovative companies: cooperation with universities.
- Innovative companies: cooperation met research institutes.

These indicators form the basis of the national Top Sectors Monitor. The first was published by the CBS in 2012 and primarily contained data on 2010. The regional measurement takes place every two years. The reporting years are 2014 (containing data on 2010, 2011 and 2012), 2016, 2018, 2020 and 2022.

Explanation of the indicators

The indicators are measured in the Innovation and R&D survey. This survey comprises questions concerning investments made in R&D and other innovative activities by Dutch companies and institutes. Data on knowledge flows and the results of the innovation process are also included. In uneven reporting years, R&D is measured and, in even reporting years, other aspects of innovation are measured by means of a CIS survey. These CIS surveys are held every two years among a proportion of the company units in the target population. They take place on a random basis (using stratified samples) among companies and institutes that employ more than ten people and are established in the Netherlands. The random sample comprises about 15 thousand company units.

- Private R&D expenditure
  Total expenditure of the private sector on R&D in millions of euros. Expenditure on own research (own personnel) and outsourced research. R&D outsourced within the concern or to other businesses, universities or research institutes (such as TNO) in the Netherlands or abroad.

- Private R&D expenditure of SMEs
  Businesses employing up to 250 people.

- Innovative companies: technological and non-technological innovation
  The number of companies that have carried out innovations, divided into:
  - Technological innovations:
    - Product innovation;
    - Process innovation;
    - Broken off or not yet completed.
  - Non-technological innovations:
    - organisational innovations;
    - marketing innovations.

- Innovative expenditure
  The expenditure on innovation comprises the total of the expenditure on own and outsourced research, related equipment, other external knowledge, training, the market introduction of innovations, design and other preparations, for technologically new or greatly-improved products (goods or services) or processes.

- Innovative companies
  The number of companies that cooperate with other companies or institutes in the field of innovation. This cooperation can be divided into:
- cooperation with government or public research institutes;
- cooperation with universities.

8.2 Methodology

The R&D and the CIS surveys measure the aforementioned indicators on the basis of random sample design for the whole of the Netherlands and for the entire population of companies. In this assignment to collect data for the seven indicators for the top sectors for each region, the CBS will have to break down the data accordingly (region x top sector). In 2013, the CBS will study the development of a method that will yield reliable data.

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- Advies topteam Logistiek
- Advies topteam Life Sciences & Health
- Advies topteam Tuinbouw en Uitgangsmaterialen
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