

A year
in stories
2021

open
× *ing*
new
hori
zons



Research Foundation
Flanders

*open
ing
new
hori
zons*

Contents

Forewords

<i>Minister Jo Brouns</i>	6
<i>Willy Verstraete & Hans Willems</i>	8

Interviews

<i>Rik Van de Walle & Koen Verlaeckt</i>	10
<i>Elisabeth Monard, Christophe Vandeviver & Jozefien De Leersnyder</i>	16
<i>Mark Andries & Eric Van Zele</i>	22
<i>Reinhilde Veugelers & Dirk Inzé</i>	28

<i>About the FWO</i>	30
----------------------	----

<i>FWO figures</i>	40
--------------------	----

Last year, Flanders received a good report from the European Commission for our performance in the domains of research and innovation. We belong to a select group of 'innovation leaders' in Europe. A credit to all actors in the Flemish innovation chain, says Minister Jo Brouns. "But we cannot rest on our laurels."

What has happened in recent years to result in this good score?

"The Flemish government has been putting extra effort into research and development for more than ten years and has a long-standing tradition of stimulating cooperation between knowledge institutions and companies. This combination is bearing fruit. Both our small and large businesses are very active when it comes to innovation. And our research is among the best in the world. In other words, we owe this result mainly to the many efforts of all the partners in the Flemish innovation chain."

Who are these partners?

"Without wanting to make an exhaustive list, I think first and foremost of our universities. They are rightly regarded, worldwide, as pioneers in the search for sustainable solutions to social problems. The Flemish Interuniversity Council [Vlaamse Interuniversitaire Raad - **VLIR**], the Young Academy [Jonge Academie - **JA**] and the Royal Flemish Academy of Belgium for Science and the Arts [Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten - **KVAB**] deserve special mention. I stay in contact with them to keep my finger on the pulse of the research world. In addition, there is the important role that the Flemish Strategic Research Centres [SOC], the VIB, imec, VITO and Flanders Make, play in building bridges in spearhead domains between fundamental and more application-oriented research."

"And finally, the Agency for Innovation & Entrepreneurship (Agentschap Innoveren &

Ondernemen - **VLAIO**) is also an important partner. VLAIO ensures that the innovations originating in universities, for example, trickle down to our economy via the spearhead clusters. Spearhead clusters are strategic collaborations between Flemish companies and knowledge institutions.

And when you consider all of Europe, then the European Research Council (ERC) enters the picture. In Flanders, the **ERC** is a major source of funding for frontier research: bold research that allows science to make great leaps forward all at once. Our researchers are remarkably successful at winning prestigious ERC grants. After all, they learn the tricks of the trade by participating in the FWO's calls for proposals. I would therefore like to explicitly mention the FWO as an innovation partner. Without the funding of fundamental research and the expert guidance of promising scientists, our innovation engine would not run nearly as smoothly as it does."

Should Flanders try to close the 'innovation gap' with the other European top regions?

"Absolutely. Our ambition is to climb to the top-five of the most innovative regions by 2030. We have the assets to reach that summit. Consider our unique biotech, advanced chip technology and digital applications ecosystems. The least sensible thing we can do is to rest on our laurels. With societal challenges ahead in the areas of climate, ageing, digitalisation and care, there are still plenty of opportunities we need to address."



"Without fundamental research, the Flemish innovation engine would not run nearly as smoothly as it does."

• 48.5

• 14.2

6

• 11.6

7

“Irrepressible curiosity must continue to be supported.”

No innovation without inspiration. And as everyone knows, ground-breaking insights do not arise on command. They often appear at unforeseen moments, from unexpected corners and in surprising forms.

Exploring, testing and evaluating – this approach leads to inspiration, innovation and breakthroughs. And that is what we at the FWO want to make possible. Our mission? Giving researchers the opportunity to keep asking new questions about our reality. Questions that require research which, in turn, requires concrete resources and efforts. Even though we usually do not know where this research will lead us, the results have very often opened up unexpected perspectives. That was true of the penicillin drugs in the 20th century, and it is equally true of COVID vaccines today. And such insights have also proved to be very influential in the social sphere.

That is why the willingness to provide substantial long-term support for each step in the knowledge chain is essential. Based on the most recent figures published in 2021, Flanders exceeded the Lisbon target of 3% of gross domestic product spent on research and development. That pays off. In the 2021 European Innovation Scoreboard, parameters such as the number of doctorates, scientific publications and patents indicate that we belong to a select group of 'innovation leaders'. The only countries that surpass our region are Sweden, Finland and Denmark. So, the strategy to put Flanders on the track for the new knowledge economy by 2020 has already been partially realised.

It is not only the financial impulses from successive Flemish governments that help to achieve that goal. It is precisely because the FWO coordinates so well with the quadruple helix of government, companies, knowledge institutions and citizens that we are able to achieve such impressive figures.

The success of the past few years must not lead us to loosen the reins. Perseverance is now key. It goes without saying that the world has become no less complex and uncertain. With the corona pandemic, that started in 2020, we have tread through deep waters. And the war in the east of Europe threatens to cripple the economic recovery. Science and innovation help to safeguard both our prosperity and our well-being from stagnation and decline. Researchers with irrepressible curiosity must continue to be able to count on the support of the FWO and other funders in order to lay a solid foundation on which their endeavours in applied research and innovation can continue to be built. This also makes Flanders a sought-after partner for other countries and regions – both within and beyond Europe. And that is important, because international cooperation and a good understanding are indispensable in preparing us for the future.

In this yearbook, policymakers in the domains of research and development exchange ideas on how to further shape policy. In this way, they help to lead the way forward for a region that must rely on knowledge and creativity. With the FWO, as always, as a loyal and responsible partner.

Enjoy!



Willy Verstraete

Hans Willems

23.7

48.5

14.2

11.6

“Fundamental research gave us an advantage in the fight against the coronavirus.”

• 48.5



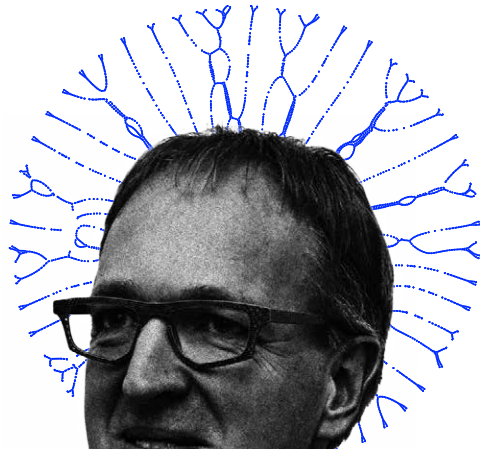
• 14.2



10

23.7 •

63.5



Rik Van de Walle



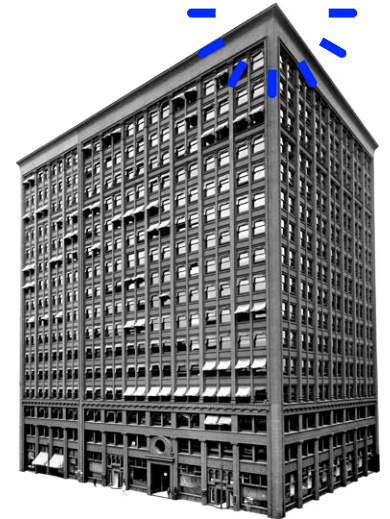
EXPERIMENTA



Koen Verlaeckt



• 94.3



• 11.6



11

The fact that Flanders has assumed a prominent position in the European race for research and innovation is partly due to the efforts made by our universities. We spoke to Rik Van de Walle and Koen Verlaeckt of the Flemish Interuniversity Council about the European benchmark, the importance of fundamental research and strategic basic research and the climate crisis.

Our region scores remarkably better than the European average on several indicators of higher education performance. As a result, Flanders produces an above-average number of people with higher education diplomas. The same applies to the number of international scientific co-publications, a good indicator of the extent to which our research is embedded internationally.

All this is evident from the Regional Innovation Scoreboard 2021, which the European Commission presented in the middle of last year. This positive report is the fruit of the joint efforts of all the actors within the Flemish R&D landscape, including the universities. Chairman Rik Van de Walle (UGent) and Secretary-General Koen Verlaeckt of the Flemish Interuniversity Council (VLIR) share their vision.

Flanders has relatively more 25-34 year olds who have completed higher education than the average in Europe. How did we get there?

Koen Verlaeckt: "A first explanation relates to the academic offerings of our universities. These have become much more varied in recent decades, so that more students are finding their liking among the various fields of study. In addition, the possible learning pathways are more diverse today. For example,

it is easier today to complete a course of study that you have put on hold for a time. Or to combine working and studying."

Rik Van de Walle: "In general, the interaction between academia and the labour market is now better than it was in the past. The range of courses offered at universities is more attuned to the needs of companies and other employers. At the explicit request of the business world, some of our programmes, for example, paid more attention to artificial intelligence and data science. This coordination is crucial for innovation."

Certain European regions score even better than Flanders in terms of the relative number of people with higher education diplomas. What needs to be done to close that gap?

Verlaeckt: "I don't think you can speak of a 'gap'. There is a significant difference with several top European regions, such as Stockholm, but that is inevitable in this kind of benchmarking. However, that does not take away from the fact that Flanders is up against some challenges, such as improving the flow of our students to the workplace. Many students take significantly longer than average to complete their studies. They should be choosing alternative fields of

study sooner, whether at university or otherwise. This Flemish government has already taken steps in that direction and is linking that idea to the principle of compulsory remediation."

"Another challenge is that of lifelong learning. Flanders still has a long way to go in motivating people over the age of 35 to continue their education. This is also reflected in the European benchmark. For the 'lifelong learning' indicator, our region scores far below average. An OECD report pointed this out to us a few years ago."

Van de Walle: "The Flemish universities themselves make every effort to facilitate lifelong learning. Among other options, there is the Nova Academy, an accessible platform that gives an overview of the possibilities for continuing education at the UA Antwerpen, UGent and the VUB. Getting the whole population involved in lifelong learning is a priority for our universities."

Another indicator on which Flanders does better than average is the number of scientific publications with at least one non-European co-author.

Van de Walle: "That doesn't surprise me. It shows once again how well the research and development activities taking place here are internationally embedded. The number of co-publications with foreign authors is also increasing systematically. In other words, we are working more and more internationally, and that is a good thing."

"As it happens, knowledge is the only raw material we have in Flanders. If we want to continue tapping into this raw material in the future, we need to focus on exchanging the latest insights with researchers from other countries. Moreover, our region has an open economy that thrives on cooperation with international partners, including in the field of R&D."

Verlaeckt: "Another sign that Flanders is doing well on the international stage in terms of research and development is the increase in international contract revenues. For example, our scientists are increasingly obtaining European funding for their research projects."

"The fundamental research of today lays the foundation for the valorisable research of the future."

Koen Verlaeckt

Although I would like to make a side note regarding this: These scientists are often forced to look for alternative sources of funding, because Flemish basic funding is being eroded by ongoing cutbacks."

What is the current status of fundamental research funding? Are sufficient resources being directed there?

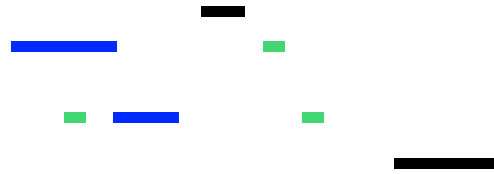
Verlaeckt: "Funding for fundamental research is decreasing, which we regret. Until some fifteen years ago, about 60% of Flemish government funding for R&D went to fundamental research and 40% to other research. Today, that situation is reversed. Here at the VLIR, we think it is important that a balance is struck and that the government once again increases its investment in fundamental research. Incidentally, the government is the only actor that can and should finance this type of research."

Van de Walle: "That's correct. You cannot expect this from the business world, for example. First and foremost because this is curiosity-driven research. It is research that stems purely from curiosity, the scientist's drive for knowledge. He or she does not have to answer for the point of the research, let alone its usefulness. When evaluating the research, only the scientific process counts, not the result."

"Furthermore, fundamental research always entails greater risks. You have no idea in advance of the results, let alone their usefulness. The value of this type of research lies in the creation of knowledge itself: After the completion of the research, you know something you did not know before. It goes without saying that private investors, apart from a few patrons, do not want to take such a risk."

Knowledge for knowledge's sake, big risks... Why do you still think it is important to invest in fundamental research?

Verlaeckt: "It is a legitimate and understandable demand from certain critics to focus public funding on demand-driven, valorisable research. But – and this is crucial – the fundamental research of today lays the foundation for the valorisable research of the future. If you stop investing in fundamental knowledge, you ultimately dry up future research. You take away the foundation for the concrete innovations of the future."



"Having all scientists research a select group of solutions for the climate problem is not a good idea."

Rik Van de Walle

Van de Walle: "The corona pandemic is perhaps the best example. Thanks to earlier fundamental research at our five Flemish universities, we had built up a head start on the virus. This meant that in Flanders we were able to quickly join the search for effective tests, antiviral medications and vaccines in a targeted manner. Without fundamental research, we would have had to start from zero at the moment that the first infections were being discovered."

To stay with the topic of urgent challenges: Wouldn't it be better if all research and development activities in Flanders focussed on a solution for the climate crisis?

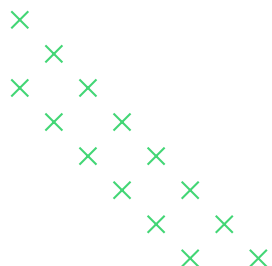
Van de Walle: "I recognise the urgency of the climate problem, but to focus the efforts of all our researchers on a select group of possible solutions is not a good idea. The last thing you should do is to impose from above which paths are to be explored. After all, there is no 'silver bullet' for climate change and all that it entails."

"Taking the UN Sustainable Development Goals as a starting point would also limit the scope of the research too much. To tackle the climate problem, we need, first and foremost, more fundamental knowledge. Only bottom-up research, fuelled by curiosity, can fan out far enough to reveal the whole range of solutions."

Verlaeckt: "The researchers at our universities have both feet firmly planted in society. This ensures that even fundamental research automatically focuses on the major challenges of our time. This is self-evident and applies to all domains of research. Scientists don't need any incentives from above for that."

• 48.5

• 14.2



• 11.6

▲

*“The 3% target for R&D?
A Flemish idea, picked
up by the European
Commission!”*



Christophe Vandeviver

Jozefien De Leersnyder



Elisabeth Monard

S T A Y P R E



2 1 0 2 7 1 1 7 5 6 5 4
1 1 7 1 3 1 3 1 0 5 7 7 4
3 1 1 1 3 3 6 8 7 0 3 7
2 3 2 9 5 5 5 4 0 3 7
1 2 3 5 4 0 1 0 1 0 0 0
3 1 5 5 6 3 4 1 5 7 1 5
2 5 5 7 9 9 2 9 0 8 6
1 1 6 0 5 3 3 3 7 9 0
3 3 7 7 6 9 9 5 5 0 7
2 2 0 6 7 2 5 3 4 7 6
1 1 0 5 8 3 6 9 5 5 5

• 48.5

• 14.2

• 11.6

Where are the opportunities for the Flemish research world to innovate even more? In collaborating with artists, in increasing the diversity of our universities, and in focusing on both STEM and SHAPE talent. Elisabeth Monard (KVAB), Jozefien De Leersnyder and Christophe Vandeviver (both from the Young Academy) explain why.

The Young Academy (JA) and the Royal Flemish Academy of Belgium for Science and the Arts (KVAB) play a prominent role in the academic life of Flanders. But they also make their voices heard beyond Flanders. In fact, both organisations feel most at home at the intersection of science, art, and social engagement.

Elisabeth Monard, Chairperson of the KVAB and Honorary Secretary-General of the FWO, Jozefien De Leersnyder (KU Leuven) and Christophe Vandeviver (UGent) have the floor. De Leersnyder and Vandeviver are both research professors and were elected Chairpersons of the Young Academy at the beginning of last year. We asked for their opinion on the European Commission's innovation benchmark.

The European benchmark shows that more students in Belgium obtain a PhD in a STEM subject than the average in Europe. There are no figures for Flanders itself...

Elisabeth Monard: "I must contradict that. There are some figures for Flanders; they have been recorded in the Flemish Indicator Book, and they are good. Better even than those for Belgium. The number of doctorates is

increasing year upon year compared to a decade ago. Moreover, most doctorates are awarded in the fields of science and the applied sciences. It is the result of a catch-up exercise that Flanders embarked on in response to a call from Europe in the early 2000s."

"At that time, we were asked to significantly increase the number of researchers in order to reach the same level as the United States. Successive Flemish governments have consistently released not only more budget for research and innovation, but also more doctoral and post-doctoral positions. This policy is now bearing fruit! You can see this in the number of doctorates, whether or not in a STEM discipline, but also in the publications and citations of our researchers in highly regarded journals."

Can we sit back and relax now?

Monard: "No, the demand for STEM talent will continue to increase. The number of doctoral students must continue to rise, as must the proportion of female researchers in that group.

Broadening the influx to university STEM courses starts early, with initiatives in secondary, primary and even nursery schools. But in order to respond to major social challenges, you also need researchers from the cultural, behavioural and social sciences."

Christophe Vandeviver: "A very valid point! Investments in STEM can only pay off if you simultaneously invest in the social sciences, the humanities, and the arts – the so-called SHAPE disciplines. In order to tackle the major challenges of the 21st century, more will be needed than merely technical solutions."

"The climate crisis, for example, is not purely a CO₂ issue. It comes with a social component that should not be underestimated. This requires radically different ideas, away from the well-trodden paths. These ideas will only come about through dialogue amongst the disciplines. Europe already understands this: In the Horizon Europe programme, investments in STEM and SHAPE go hand in hand."

Jozefien De Leersnyder: "The fact that you cannot start early enough also applies to the SHAPE disciplines. By paying attention, for example, to analytical thinking, critical reasoning, and clear communication – typical SHAPE skills

– as early as primary school. Without these skills, you cannot transfer your technical innovations to society."

"Let's continue with the example of the climate crisis. How to solve this problem technically is gradually becoming clear. But convincing society of the necessity of climate measures and driving behavioural change, well, that's another matter. For that, you need insights from the SHAPE sciences. One cannot exist without the other."

It is noteworthy that the European benchmark does not include an indicator on art. Is that a good thing or a bad thing? Can art trigger innovation?

De Leersnyder: "That is a bad thing. We should not underestimate the potential of art in innovation. Artists challenge scientists to leave their comfort zones and look at social issues from a different perspective. These fresh insights are essential for innovation. And do not underestimate the artists themselves. Their artistic work can sometimes lead to a scientific breakthrough in the short term."

Vandeviver: An example of this is a project by Frederik De Wilde, an artist associated with the Young Academy. In 2010, he developed the 'blackest black':

"Our auditoriums are not culturally diverse enough. Because of this, we are allowing a huge potential for innovation to go underutilised."

Christophe Vandeviver

a colour that makes you experience exactly what 'nothing' is. The project was picked up by the American space agency NASA, which today uses the colour to limit the amount of light entering telescopes."

Monard: "I absolutely agree. Last year, the KVAB produced a publication entitled *Kunst, wetenschap en technologie in symbiose [Art, science and technology in symbiosis]*. In it, we explain how art can inspire science and vice versa, with great examples of this cross-pollination. Internationally, artists are increasingly part of multidisciplinary teams working on social challenges. That is a positive development and something we should also focus on more strongly in Flanders."

The European Commission's Regional Innovation Scoreboard also fails to address gender diversity in research and innovation. How does the Young Academy view this?

De Leersnyder: "We know that gender diversity in R&D can contribute to innovation; there are studies about this. But it is not the only form of

diversity that brings innovation. Ethno-cultural diversity is also important. This is because people with different backgrounds bring new perspectives to research teams. And this creates a better breeding ground for creativity and innovation than when one perspective dominates."

"People with a different gender or cultural background really need to be listened to. This is the only way that the added value of a diverse team can be expressed. So, if you want to use diversity as an indicator of innovation, don't start counting the number of women, for example, but look to see if their perspective counts when decisions are made."

Vandeviver: "More cultural diversity in our universities is a big challenge for Flanders. Science here is still much too often a 'white' affair in which a dominant perspective sets the tone. Because of this, we are allowing a huge potential for innovation to go underutilised. Too few young people from different cultural backgrounds find their way to our auditoriums. While we urgently need them to meet the challenges of the future."

"The FWO can make a difference, especially during doctoral-level education, by reviewing how it defines 'excellence'. Today, that concept is based on a model pathway at the university. But



"STEM talent remains crucial, but to ensure the acceptance of innovation, you also need the cultural, behavioural and social sciences."

Elisabeth Monard

"Artists challenge researchers to see things from another perspective: This is essential to come to innovation."

Jozefien De Leersnyder

students from other backgrounds often do not have the opportunity to follow such a path, for example, because they must combine their studies with work. A system along the lines of the Mosaic Fairs in the Netherlands could remedy that."

It was shown, in 2021, that Flanders reached the 3% target for investment in research and development for the first time in 2019. Why is public spending on R&D so important?

Monard: "The 3% target implies that private organisations account for 2% of the investments and the government for 1%. The 1% also includes public expenditures on fundamental scientific research. This unencumbered, knowledge-expanding research is needed first and foremost because it enables the training of knowledge

workers, who are of great significance for the prosperity and well-being of our region. It contributes to cultural elevation and is the first link in the innovation chain. And, it provides for the expansion of knowledge required to solve societal problems. Four good reasons, in my opinion, to continue along this path."

"By the way, did you know that the 3% target was an idea stemming from the Flemish Council for Science Policy (*today's VARIO, ed.*)? In 2000, inspired by the development cooperation norm and the Maastricht norm for fiscal discipline, the Flemish Council for Science Policy proposed the establishment of a European norm for R&D investments that would be linked to the gross domestic product. The European Commission picked up that advice and two years later turned it into a target!"

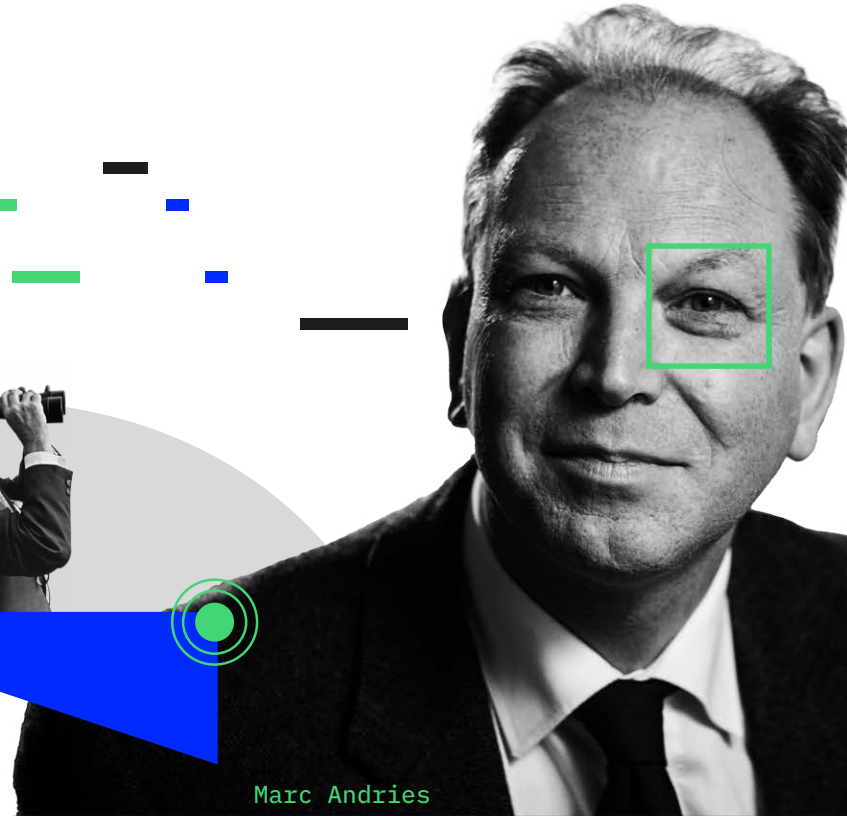


“Fundamental research and valorisable research cannot exist without one another.”



• 48.5

• 11.6



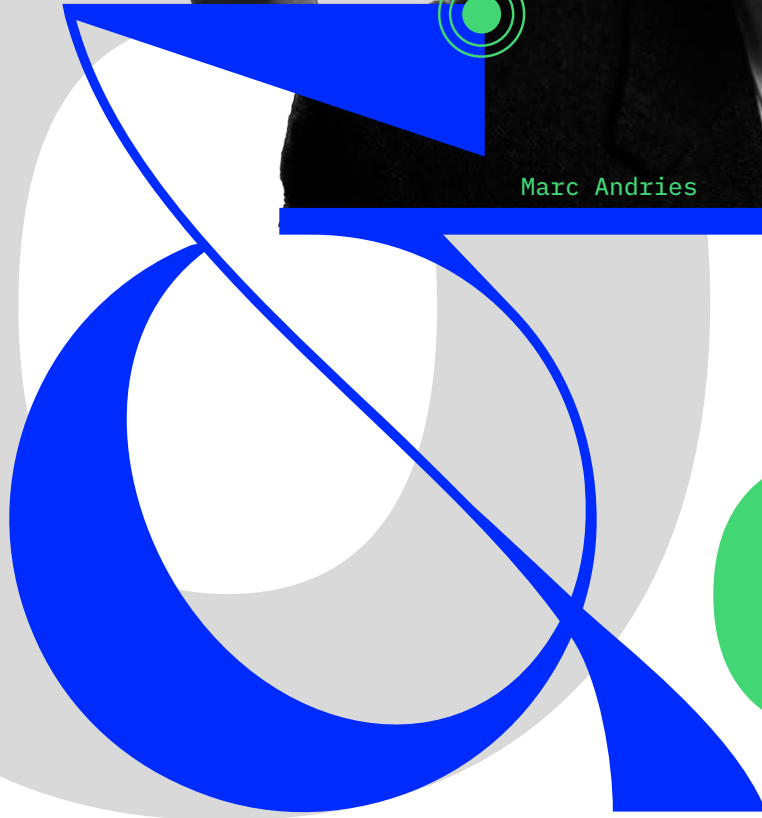
Marc Andries



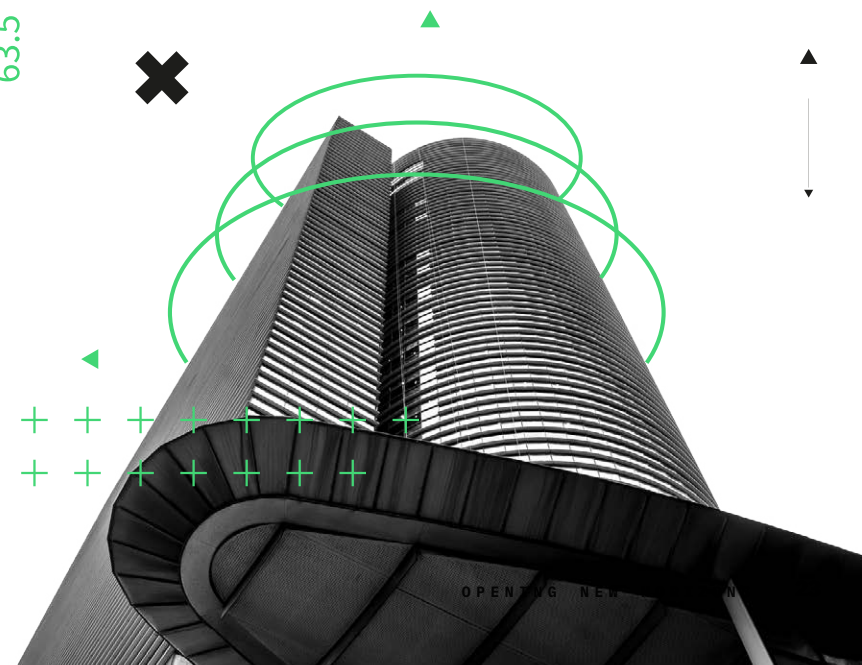
Eric Van Zele

• 14.2

• 11.6



63.5



Companies – and especially SMEs – play an important role as drivers of innovation. Especially if they can join forces with knowledge institutions, such as universities, for their R&D endeavours. It is therefore no coincidence that the Agency for Innovation & Entrepreneurship is strongly committed to this, explain Administrator-General Mark Andries and Eric Van Zele, Chairman of the decision-making committee of the Innovation and Entrepreneurship Fund.

The FWO is not the only governmental institution in Flanders that dares to make risky investments in order to arrive at innovations. The high risk/high gain principle that is typical of fundamental research also applies to some extent to R&D investments in companies. Is the market willing to sufficiently support an entrepreneur's innovative project? That is when the Agency for Innovation and Enterprise (VLAIO) steps into the breach – provided the project meets the right conditions.

What does VLAIO do to support the R&D activities of companies in Flanders?

Mark Andries: "One of VLAIO's missions is to give a financial boost to entrepreneurs with an innovative idea that requires research and development activities. The budget that we receive from the Flemish government for this has increased considerably in recent years, just like the other budgets for R&D in Flanders. Every year we have some 400 million euros available to help companies innovate."

Eric Van Zele: "Of course, this financial support is not unconditional. To be eligible for a subsidy, an innovative project must meet certain criteria. In addition, companies must be able to bear about half of the investment themselves. It is therefore not the case that VLAIO funds these projects in full, which is different from the way the FWO often works when supporting fundamental research."

Do VLAIO subsidies really have an impact?

Van Zele: "400 million euros per year is a lot of money, but we must realise that it is only a fraction of what companies in Flanders spend on R&D. Yet we know from research that VLAIO's financial support makes a difference. Especially for SMEs."

Andries: "Small- and medium-sized enterprises make up about 75% of our target audience. Thanks to the support we give them, they invest in R&D projects that would otherwise not take place. Our subsidies have even proven to be an incentive for companies to allocate additional resources to innovation."

"The Flemish universities are of an international level. Our entrepreneurs reap the benefits of this."

Mark Andries

Van Zele: "You should also know that it is mainly the smaller companies that come up with ground-breaking innovations. It is there that the greatest creativity and innovative power resides. However, these small enterprises, which have the greatest potential for innovation, also have the least financial resources. For them, the VLAIO subsidies have a great impact."

The Regional Innovation Scoreboard 2021 shows that SMEs in Flanders collaborate much more than average with other organisations to achieve innovation. Does that surprise you?

Andries: "Absolutely not. Encouraging these collaborations is something we at VLAIO are strongly committed to. More specifically, through the spearhead clusters we are setting up. Spearhead clusters are cooperation partnerships between companies, knowledge institutions and the government across sectors and in domains that are strategically important for our region."

Van Zele: "Today, there are seven such clusters. One example is Catalisti, which aims to make the value chain around chemicals and plastics in Flanders even more innovative, competitive, and international. You have to see these kinds of clusters as a kind of ecosystem from which innovations can emerge, and in which our universities play a major role."

How important are the Flemish universities for the innovation in our companies?

Andries: "Very important, because one never innovates from nothing. Our companies can often build their innovations on know-how previously developed at a university. Flanders has five universities, and they are all excellent knowledge institutions. In terms of education and research, they all compete at an international level. And our entrepreneurs reap the benefits of this."

• 48.5



• 14.2



"And that is why VLAIO also encourages collaborations between universities and industry. We have already mentioned the spearhead clusters. In addition, companies can also use our subsidies to have a university or other knowledge institution carry out R&D activities for which they themselves do not have the infrastructure. And, for example, there are also our Baekeland mandates. With those, we co-finance doctoral projects that are performed in cooperation with a Flemish company and which, if successful, will have added economic value for the company."

Van Zele: "It is certainly true that our universities share knowledge with industry, but what is striking is that it is often the same big players who benefit. As far as I am concerned, universities should make more efforts to introduce their innovations to an even larger group of companies. Today, this knowledge diffusion is not broad enough. This is a known weakness in the Flemish innovation landscape. VLAIO is tackling this through initiatives such as the spearhead clusters, but there is still work to be done."

"Moreover, I regret that when an innovation that originated in a Flemish knowledge institution develops into a marketable product or service, the added economic value usually does not stay in Flanders. In this respect, there is too little spin-off to our own companies. Keeping Flemish innovations in Flanders: Now that is something to make greater efforts toward in the future, in order to make maximum use of the potential of our knowledge ecosystem."

How does an agency such as VLAIO view the funding of fundamental and strategic basic research? Research that does not provide an immediate return on investment?

Andries: "We realise that many of the innovative technologies on the market today only came about as a result of fundamental research carried out many years ago. Consider, for example, artificial intelligence. The fact that this is a commercial application today is due to research that began decades ago at universities, at a time when few people saw its commercial potential. So, there need not be a dichotomy between



"Keeping the economic added value of our innovations in Flanders: that is something we should focus on more strongly."

Eric Van Zele

fundamental and valorisable research. We understand very well that the two cannot survive without one another."

Flanders ranks lower (27th) in the Regional Innovation Scoreboard than the Brussels-Capital Region (14th). Why is that?

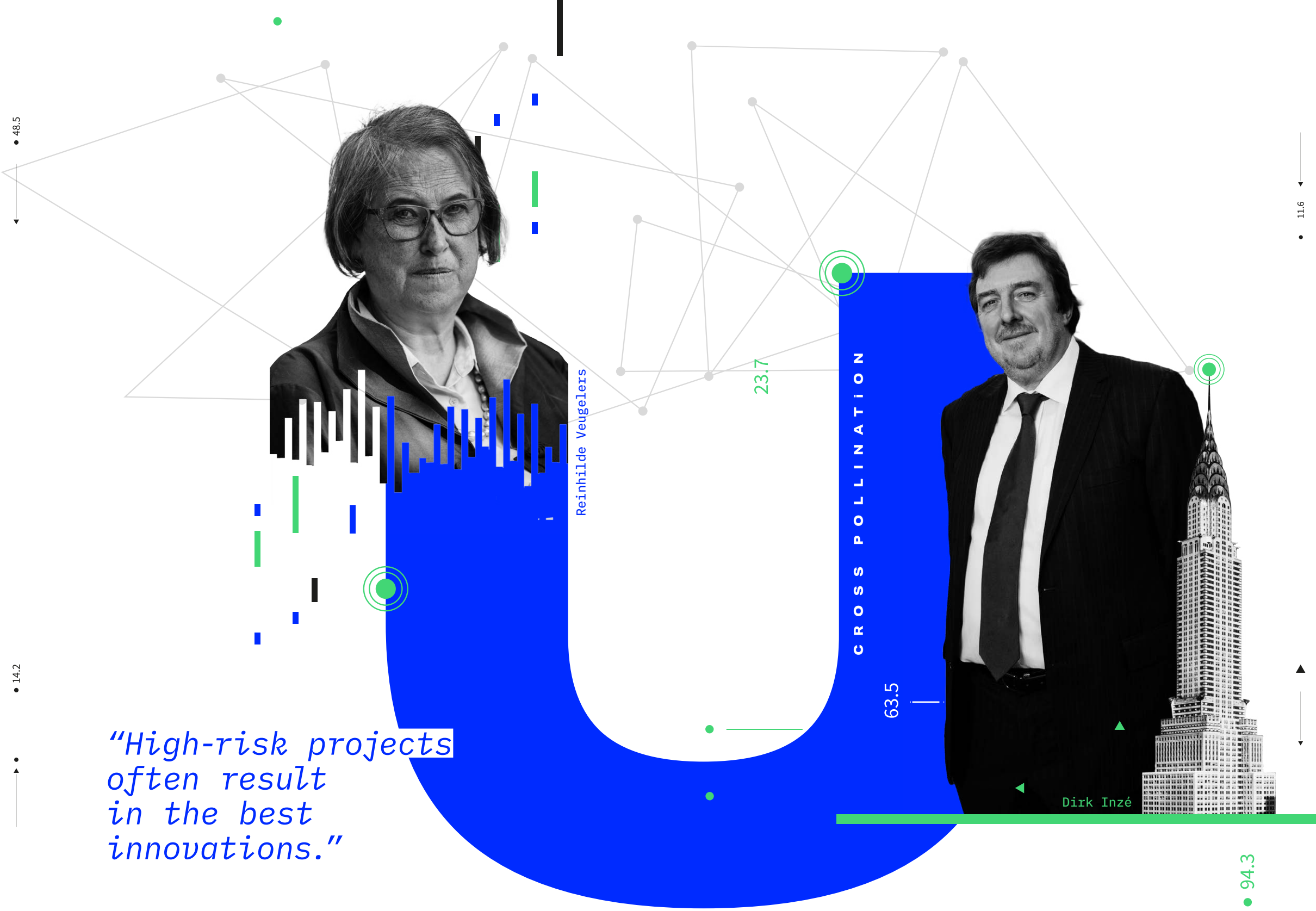
Andries: "The capital region of any country is a magnet for innovation. It is no different in Belgium. Brussels has more than a million inhabitants, it has several universities, and it is home to the headquarters of large companies and international institutions. Together, these factors create an ideal ecosystem for innovation. There are Flemish cities that come close, but in a capital city the innovative dynamism will always be greater; no sense making a fuss about this."

Van Zele: "Brussels' strong performance in innovation is also good for Flanders. Many companies with headquarters in Brussels have branches in our region. This creates economic synergies; the logistics activities around the airport in Zaventem are a good example. So, we should not be jealous of Brussels' good innovation score in the European report. On the contrary: As a region, Flanders can only benefit from this."



• 11.6





Reinilde Veugelers



Dirk Inzé



"High-risk projects often result in the best innovations."

CROSS POLLINATION



How does the European Research Council, the big European brother of the FWO, look at what Flanders is doing in the fields of research and innovation? We asked Dirk Inzé (VIB-UGent) and Reinhilde Veugelers (KU Leuven), both of whom are familiar with the worlds of Flemish and European research.

As the flagship of the Horizon Europe programme, the European Research Council (ERC) plays a key role in research and innovation in Europe. With a budget of around €2 billion per year, the ERC is the most important funding body for individual researchers in the EU. At the helm of this prestigious funding agency is a Scientific Council made up of leading academics from all branches of science.

Today, one Belgian serves in the Council: Dirk Inzé, Scientific Director of the Vlaams Instituut voor Biotechnologie (Flemish Institute for Biotechnology). He and economist Reinhilde Veugelers (KU Leuven), a former member of the Scientific Council, take a more European look at our region's innovative strengths.

Today, Flanders is among the front-runners in Europe in terms of innovation. How did we achieve this?

Dirk Inzé: "May I start with a side note? I don't think it is such a good idea to benchmark regions against each other. An ecosystem for innovation is always nationally or more broadly embedded. The situation in our country is a good example of this. The Brussels-Capital Region is ranked higher than Flanders (*in 14th place, ed.*). But a Dutch-speaking university in Brussels, which contributes to that good ranking, can count on Flemish resources for its funding. This is fine, of course, but it shows that focusing solely on regions is too limited."

Reinhilde Veugelers: "You must also remember that some of the leverage that benefits regional R&D activities is sourced at the national level. Consider tax measures such as the partial exemption from payroll tax for researchers. When it comes to innovation, a region is never a closed system. On the contrary, the best innovative ecosystems are characterised by their openness. By their connections to knowledge networks in other regions and countries."

"Fostering synergies between scientific disciplines – therein lies enormous potential for innovation."

Dirk Inzé

Duly noted! But even with that in mind, you can't deny that Flanders is doing very well.

Inzé: "Absolutely, I totally agree with that. Flanders performs particularly well in terms of innovation. This is a credit to the FWO, to our universities and to other knowledge institutions, but also to an agency such as VLAIO, which focuses on innovative projects. We can be proud of that."

Veugelers: "The Flemish government has consistently increased its funding for research and development in recent years. That also plays a part in our success. Whereas other regions or countries have sometimes pursued a yo-yo policy, Flanders has always tried to meet the 3% target. This creates a climate of security for scientists who, as a result, stay here and do not seek refuge elsewhere."

Inzé: "Another explanation for our good performance is that Flanders dares to make choices. That we dare to focus some of our investments in domains

where we excel, such as biotechnology and nanoelectronics. With the VIB for the former domain and imec for the latter, our region is home to two world-class research centres."

Veugelers: "That is true, although I would add that such choices should not be too narrow. Focusing on your strengths is one thing, but it is also important not to neglect other areas of research. Only in this way can synergies arise across disciplines, with even greater potential for innovation. After all, innovations often emerge from the combination of knowledge from various domains, driven bottom-up by collaborations between researchers."

What can we learn from European regions that score even better than we do?

Veugelers: "It is striking that there are many Swiss regions among this group. They are known for the strong interconnectedness of their academia, industry and government – the so-called triple helix. This interaction also exists



“Innovations often arise from a confluence of knowledge from different research domains.”

Reinhilde Veugelers

in Flanders, but the Swiss take it a step further. Their ecosystem for innovation is even more tightly knit.”

“These other 26 regions (*Flanders occupies the 27th place in the Regional Innovation Scoreboard, ed.*) are also more successful at attracting top, international researchers. With the intention of bringing them to their countries but also to then exchange them with other institutions, so that there is a constant flow of knowledge. In that respect, Flanders is not doing so well.”

Inzé: “There are indeed a number of stumbling blocks in our region that stand in the way of the arrival of the absolute top talents. The salary conditions at our universities, for example. The brightest minds are usually spoilt for choice when it comes to research institutions, and sometimes pay is the deciding factor. It is a big disadvantage in our ability to compete.”

Veugelers: “Furthermore, anyone who wants to be appointed as a professor at a Flemish university must be able to present a B2 language certificate for Dutch. That means you must speak our language almost fluently. For many foreign scientists, this is a bridge too far. They want to be able to devote

themselves fully to their research and do not have time for evening classes in Dutch. That compulsory language certificate is a real pain in the ass. Go ahead and write that down. (*laughs*)”

Do knowledge institutions in Europe see each other as competitors in their search for talent?

Veugelers: “No, science is always a win-win. Of course, we in Flanders would like to attract more top researchers, but not simply to steal those people away from other regions. What we should be striving for is that our Flemish universities participate in the constant exchange of international research talent. This creates connections from which innovations can grow.”

Flanders excels in biotechnology and nanoelectronics, as you have explained. But are there other domains where we have the potential to excel in the long term?

Inzé: “One domain that is currently on the rise is artificial intelligence. AI exists at the interface of various disciplines

that we excel in, such as biotech and faster chips, but you can also link it, for example, to medical science – which is of a very high level in Flanders. Fostering synergies between these disciplines, while focusing on AI – that’s where the potential lies.”

Can the FWO help to set up such collaborations, thereby further boosting the innovation engine?

Inzé: “Without a doubt. What is typical for Flanders is that we are rather risk averse. Yet it is often the projects with the highest risk that produce the best innovations. Collaborations across scientific boundaries involve risks by definition. The FWO is ideally suited to support this interdisciplinarity. It has years of experience in financing fundamental research and is therefore familiar with the principle of high risk/high gain.”

Veugelers: “I think the FWO fulfils its role in the Flemish R&D landscape very well. Our budget for fundamental research cannot be compared with that of larger regions or countries and yet we are achieving good results. The FWO is also following the current international trend in fundamental research of allowing individual scientists to propose their own projects, which are then evaluated strictly on the basis of scientific criteria. Although I still see room for improvement... (*laughs*)”

In what sense?

Veugelers: “What the FWO does not have today is an independent advisory body of and for scientists. A body modelled on the ERC Scientific Council, in which the members do not represent their own disciplines or institutions, but science itself.”

What would be the added value of that?

Inzé: “At the ERC, we find that this way of working – with the progress of science as the only basis for high-level policy choices – is very good for our international reputation. It is a quality label, as it were: ‘Here, only the most advanced research is funded.’ It helps that an ERC Grant is very highly regarded.”

Veugelers: “In concrete terms, this advisory body would contribute to deliberations about the composition of the FWO’s expert panels and about which strategic domains should be funded. And afterwards, it would also help evaluate whether the funds have been well spent with a view to scientific progress. It is, of course, only a suggestion. But based on our experience in the ERC, we know this works.”

About the FW0

Our mission

Science opens up new horizons

The Research Foundation - Flanders (FWO) stimulates and financially supports fundamental scientific research, strategic basic research, clinical scientific research, the purchase of large-scale and medium-scale research infrastructure and the management of large computing capacity in Flanders. With the financial resources it receives primarily from the Flemish Government, the FWO subsidises fellowships and research projects, infrastructure, travel grants and international scientific cooperation.

Science creates opportunities

Fundamental scientific research focuses on deepening the knowledge of man and his environment. As the level of knowledge in our society increases, so does our quality of life in general and the quality of education in particular. This gives young people every opportunity to develop their talents in a wide range of disciplines. The research funded by the FWO, in particular the strategic basic research, is also an important step in the valorisation of the scientific breakthroughs.

Science is essential to our well-being

In the long run, a high level of knowledge combined with human capital results in targeted and applied research, which also has a policy-supporting function. Thus, certain economic or social choices can be driven by excellent research groups. And that comes as no surprise, because research that pushes the boundaries of knowledge can become the basis for a solution to today's major societal challenges, such as the environment, mobility and health.

Science drives innovation

In the short term, fundamental research rarely leads to economic or social valorisation. In the long term, however, it is essential for our prosperity and well-being. That is why the FWO relies on the financial support of the government. There is a need for a balanced distribution of resources between targeted and non-targeted research.

By financing strategic basic research in the broadest sense, FWO itself is already taking an important step towards valorisation.

The FWO and the international community

Europe has a tradition of non-governmental research councils. The FWO is a member of Science Europe and supports the activities of the European Research Council (ERC) through various initiatives, for example. In addition, the FWO is closely involved in various European research initiatives (ERA-NET, JPI, ESFRI etc.) through a range of programmes. Furthermore, the FWO has signed many bilateral cooperation agreements with leading funding agencies worldwide, including in China, Russia, Quebec and Switzerland.

The FWO supports the Flemish Supercomputer Center

The Flemish Supercomputer Center (VSC) is a virtual centre for both academia and industry. It is managed by the FWO in collaboration with the five Flemish university associations.

Which researchers do we support?

Young talents who want to prepare for a PhD, researchers who have obtained their PhD and want to further develop their skills as post-doctoral researchers, or professors who want to set up fully-fledged research projects with their teams all qualify for FWO support. Our aim is both to help train the researchers of tomorrow as well as to assist experienced scientists in their explorations. What's more, all scientific disciplines are eligible.

The main focus is on the quality of the researchers and their research proposals, regardless of their scientific disciplines, the institutions where they are working, their gender or their political or religious convictions. We implement family-friendly measures and offer flexible working conditions in order to achieve a good balance of male and female researchers. Scientists with disabilities can count on additional support to purchase adapted equipment and materials.

The FWO stimulates international cooperation within the European Union and beyond. We promote international mobility by giving researchers the opportunity to gain experience abroad and by attracting foreign researchers.

Every year the FWO awards scientific prizes. We do this not only to reward excellent research, but also to highlight the social relevance of scientific research.

For more information and lists of beneficiaries, go to www.fwo.be

How does the decision-making process work?

In order to decide which researchers and research proposals will receive funding, the FWO calls upon independent experts from Belgium and abroad. They are brought together in expert panels. The composition of the panels and the procedures they follow depend on the funding channel.

For the fundamental channels, there are 30 subject-specific panels and one interdisciplinary panel.*

Applications for PhD fellowships in strategic basic research are processed by 24 thematic panels. At least one third of the members of these panels have an industrial background.

The expert panels for strategic basic research projects are generalist panels, which evaluate thematically linked economic and social projects.

For the Applied Biomedical Research with a Primary Social Finality (TBM) programme, the submitted project proposals are divided into thematic groups based on their subject matter after the call for proposals is closed.

When evaluating research infrastructure, the FWO relies on the Science Committee for the scientific evaluation and on the Invest Committee for the evaluation of financial feasibility.

The Cross-Domain Panel (CDP) assesses applications submitted for various scientific fields, which may or may not have an international dimension.

The International Collaboration Committee (CIWC) provides advice on applications concerning the international mobility of researchers, the organisation of scientific meetings in Belgium etc.

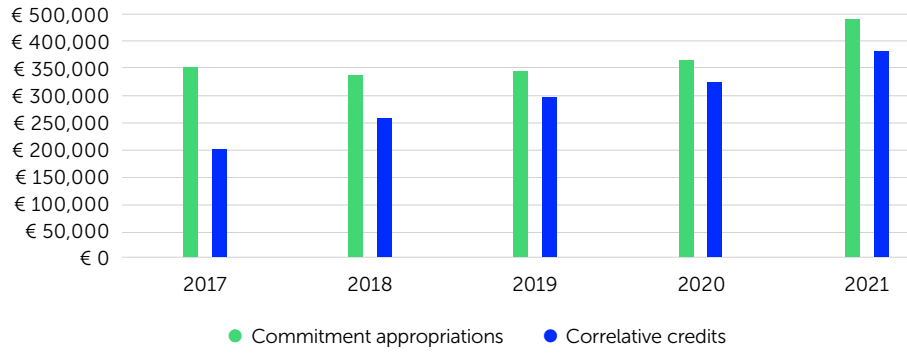
For a complete overview of all the panels and their members, go to www.fwo.be.

**Starting with the postdoctoral call for proposals that opens in the autumn of 2022, a reformed panel structure will be used. You can find more information about these changes on our website.*

FWO

figures

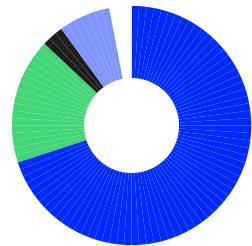
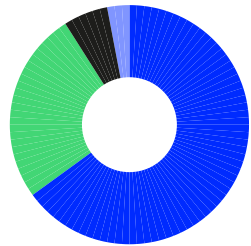
Evolution of revenue



48.5



Subsidy distribution



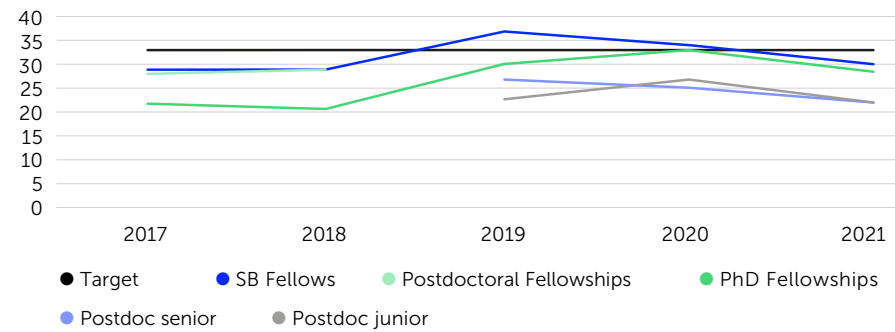
- 65% Projects
- 26% Fellowships
- 6% Infrastructure
- 3% Equipment appropriations

- 71% Fundamental programmes
- 16% SBO
- 3% Clinical research
- 7% Infrastructure
- 3% Equipment appropriations

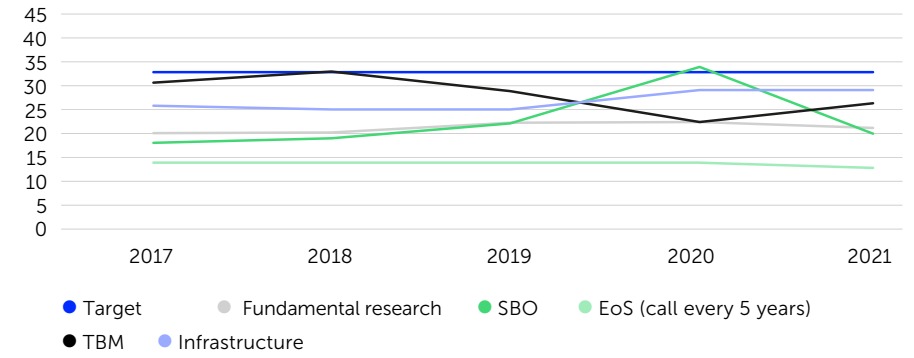
14.2



Evolution succes rate fellowships



Evolution succes rate research projects



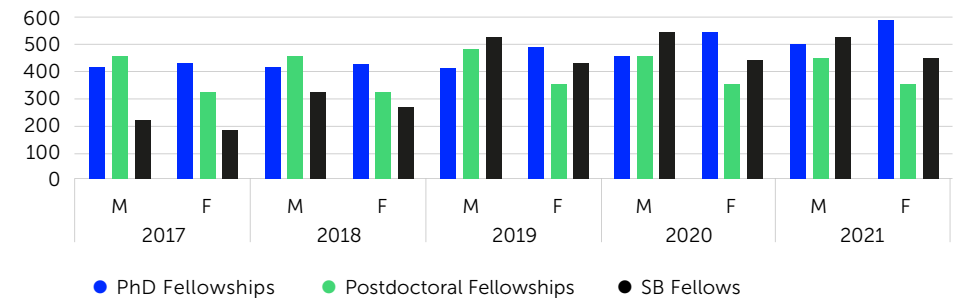
11.6



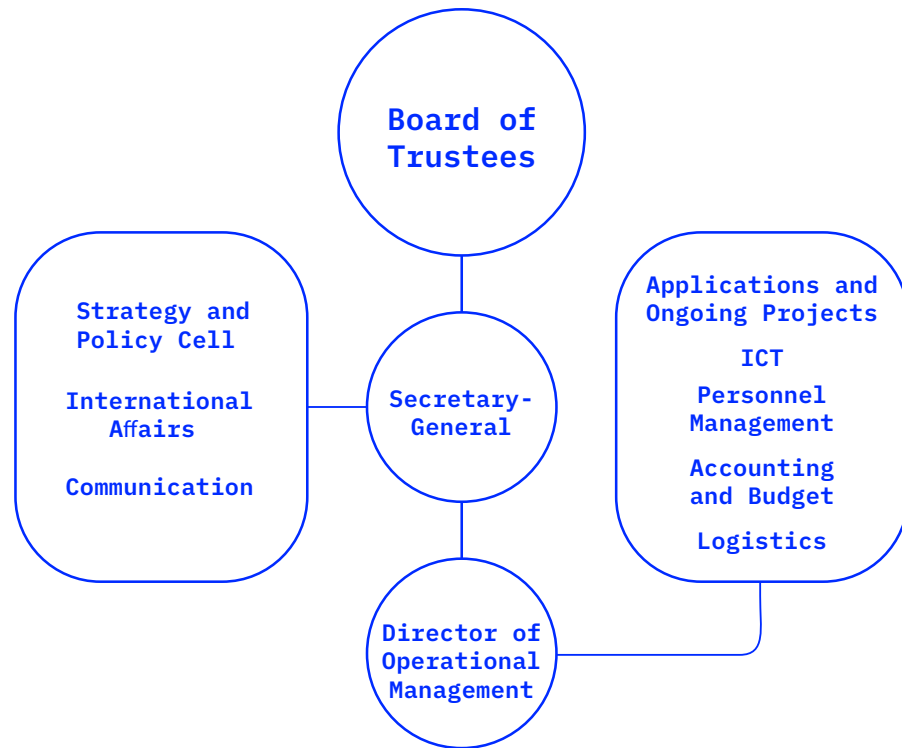
Researchers in function (1.11.2021)



Ratio male / female



Our organisation



Administration

The FWO team is always ready to assist researchers. It ensures the efficient organisation of the various evaluation processes within FWO to guarantee that the various projects and fellowships are awarded and followed up in a timely and qualitative manner. Our administration always aims for a researcher-friendly approach.

Board of Trustees

The Board of Trustees takes decisions concerning the advice of the expert panels and other committees as well as FWO operations, budget and accounts.

Current composition of the Board of Trustees

Chairperson

Willy Verstraete
Emeritus Professor - UGent

Vice-Chairperson

An Van de Vel
Senior Manager External Research - Umicore

Members

Bruno Blondé
Professor - UAntwerpen

Jo Bury

Representative strategic research centres

Paul De Knop

Prorector - VUB

Anne De Paepe

Prorector - UGent

Jan Delcour

Professor - KU Leuven

Leon Dhaene

N2FINANCE

Ann Meulemans

2Bridge

Karin Sipido

Professor - KU Leuven

Marlies Van Bael

Professor - UHasselt

Jos van Sas

Director External Affairs - Nokia Bell Labs

Member with advisory vote

Mark Andries
Lead official - Vlaams Agentschap Innoveren en Ondernemen (Flemish Agency for Innovation and Entrepreneurship)

Johan Hanssens

Lead official - Department of Economy, Science and Innovation

Secretary-General

Hans Willems

Government representatives

Herwig Hermans

Member of the New Flemish Alliance (N-VA), General Policy, Finance and Budget, Justice

Karl Lauwers

Science & Innovation Advisor, Cabinet of Minister Jo Brouns

Rapporteur

Danny Huysmans

Director of Operational Management - FWO

Stay informed

Would you like to stay informed about the various FWO programmes, our policy, FWO research and research results? Don't want to miss out on our researchers' stories? Follow us on social media.



@fwovlaanderen
#FWOVlaanderen
#Onderzoekersinbeeld

Contact us

Research Foundation — Flanders

Leuvenseweg 38
1000 Brussels
+32 2 512 91 10
communicatie@fwo.be

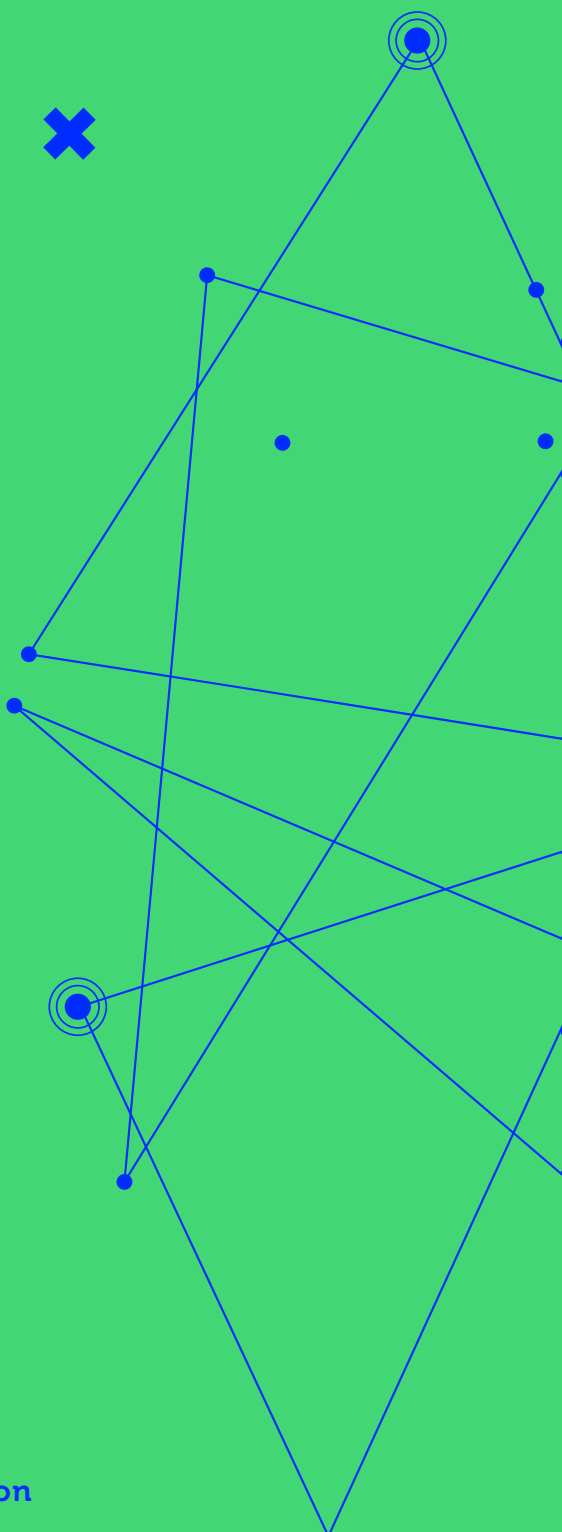
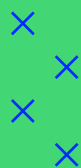
www.fwo.be

Research Foundation — Flanders

Leuvenseweg 38
1000 Brussels

+32 2 512 91 10
communicatie@fwo.be

www.fwo.be



Research Foundation
Flanders